



Report and Recommendation of the President to the Board of Directors

Project Number: 36304
November 2006

Proposed Loan
Socialist Republic of Viet Nam:
Agriculture Science and Technology Project

CURRENCY EQUIVALENTS

(as of 5 October 2006)

Currency Unit	–	dong (D)
D1,000	=	\$0.0623
\$1.00	=	D16,050

ABBREVIATIONS

ADB	–	Asian Development Bank
AMIS	–	agricultural market information system
ASDP	–	Agriculture Sector Development Program
AST	–	agriculture science and technology
CPMU	–	central project management unit
CSP	–	country strategy and program
EMP	–	environmental monitoring plan
GDP	–	gross domestic product
MARD	–	Ministry of Agriculture and Rural Development
MPI	–	Ministry of Planning and Investment
NAEC	–	National Agricultural Extension Center
NGO	–	nongovernment organization
PAEC	–	provincial agricultural extension center
PPMU	–	provincial project management unit
PSC	–	project steering committee
RRA	–	rapid rural appraisal
SOE	–	state-owned enterprise
TA	–	technical assistance

NOTE

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

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LOAN AND PROJECT SUMMARY

Borrower	Socialist Republic of Viet Nam
Classification	Targeting classification: General intervention Sector: Agriculture and natural resources Subsector: Agricultural production, agroprocessing, and agribusiness Themes: Sustainable economic growth, and capacity development Subthemes: Development of rural areas; organizational development; and client relations, network, and partnership development
Environment Assessment	Category B. An initial environmental examination was undertaken and a summary environmental analysis is a core appendix.
Project Description	The project scope includes (i) client-oriented agricultural research and capacity strengthening, (ii) grassroots agricultural extension improvement, and (iii) rural-based technical and vocational training. Activities will focus on effective management and dissemination of agriculture science and technology (AST) to promote production and marketing of agricultural and agro-based products. The Project aims to improve and modernize the AST system and institutions; and the capacity of their staff, researchers, and other stakeholders in planning and implementing advanced AST activities. Improvements in key AST areas, including agricultural research, extension, and training, will be evidenced by more client-oriented AST activities with improved mechanisms for participatory and pro-poor technology dissemination that reflect demand in the field; and improved physical and human resources for the AST system with effective communication and collaboration between public and private sector organizations. Project activities related to agricultural extension will mainly cover upland or remote areas in five selected provinces in line with the country strategy and program of the Asian Development Bank (ADB) for Viet Nam. Other project activities will have nationwide coverage.
Rationale	During 1995–2005, the agriculture sector in Viet Nam grew rapidly at an average annual rate of 4.1%, and contributed to the country's overall annual economic growth of 7.2%. From a net importer of rice in the late 1980s, Viet Nam has become one of the largest rice exporters in the world, and exports large quantities of commercial crops, including coffee, rubber, tea, pepper, groundnuts, and cashews. As part of the 10-year National Socioeconomic Development Strategy (2001–2010) and to sustain growth, employment, and exports in agriculture to help reduce rural poverty, the Government plans to (i) foster agricultural diversification into higher value products and markets; (ii) increase factor productivity, value addition, and agroprocessing; (iii) improve product quality for domestic and export markets; (iv) facilitate technology development and

dissemination through improved research and extension; and (v) increase rural industries, infrastructure, and services. The Ministry of Agriculture and Rural Development (MARD) formulated its 5-year plan for 2006–2010 to ensure sustainable and equitable growth of the agriculture sector and prepare for the country's rapid integration into international markets. To achieve these policy objectives, more effective use of AST is required for technological advancement, which will ensure food security; promote agricultural diversification; and improve the quality of high-value crop, livestock, and fishery products that are comparable with neighboring countries and trade competitors. Access to new technologies by farmers and agro-based enterprises is essential as Viet Nam's agriculture is gradually shifting its focus from increased production volumes to increased production values by identifying new production processes and innovative products and marketing. These technologies need to be developed and disseminated in partnership with central and provincial agencies of the Government, private enterprises, farmers, and international agricultural research institutions.

Major policy and structural weaknesses in agricultural research, extension, training, and market information systems in the public sector are being addressed under the ongoing Agriculture Sector Development Program. Successful reforms in these institutions will require investments in human resources and infrastructure for AST that will enable them to contribute more significantly to agricultural growth in a changing global environment. The Project will contribute to ADB's country strategy and program for Viet Nam, which aims at supporting the country's sustainable economic growth by raising agricultural productivity and promoting private agroenterprises. The Project will complement the ongoing and planned activities of other external funding agencies and nongovernment organizations, and has been formulated based on the investment needs of the relevant agricultural research institutes, organizations involved in agricultural extension, and MARD's technical and vocational training schools.

Impact and Outcome

The Project will contribute to the national goal of economic growth and poverty reduction by achieving the sustainable and equitable growth of the agriculture sector. The Project aims to strengthen the capacity of the national AST system. The advanced AST system will facilitate technology development and dissemination, improve the quality of agricultural products for domestic and export markets, and increase their competitiveness.

Project Investment Plan

The investment cost of the Project is estimated at \$40 million equivalent, including taxes and duties of \$2.62 million.

Financing Plan

(\$ million)		
Source	Total	%
Asian Development Bank	30.0	75.0
Government	10.0	25.0
Total	40.0	100.0

A loan of Special Drawing Rights 20,198,000 equivalent from the Special Funds resources of ADB will be provided, with a term of 32 years including a grace period of 8 years, and an interest rate of 1.0% per annum during the grace period and 1.5% per annum thereafter.

Period of Utilization

30 June 2012

Estimated Project Completion Date

31 December 2011

Executing Agency

Ministry of Agriculture and Rural Development

Implementation Arrangements

MARD will be responsible for overall project implementation. MARD will establish a central project management unit in its Agricultural Project Management Board. The unit, to be headed by a project director, will oversee day-to-day implementation of the Project and ensure interdepartmental coordination within MARD at the central level under appropriate technical guidance of the Department of Science and Technology, and other concerned departments of MARD. Before loan effectiveness, a provincial project management unit will be established under the provincial department of agriculture and rural development in each of the five project provinces. The unit will be responsible for overall management and supervision of the project activities related to agricultural extension in the province, including contractual arrangements for service delivery, finance and project accounting, procurement, monitoring and evaluation, and reporting. Before loan effectiveness, the Government will also establish a project steering committee to be headed by the vice minister of MARD in charge of science and technology to facilitate interministerial coordination and provide overall guidance for project implementation.

Procurement

Procurement of goods and services to be financed from the proceeds of the loan will be carried out in accordance with ADB's *Procurement Guidelines*, and the procurement plan as agreed and amended from time to time, and will follow the relevant Government procedures and regulations. Supply contracts and civil works under the Project will be limited in size; and be awarded through shopping, national competitive bidding, or direct contracting procedures according to the estimated contract value, and to ensure that procured contracts are reasonably priced and suitable for project activities, and that fair canvassing is done among suppliers.

Consulting Services

The Project will require a team of consultants, including 29 person-months of international and 96 person-months of national consultants in the fields of agricultural research management, agricultural extension management, agricultural vocational training, social development, environmental assessment, financial management, and monitoring and evaluation. An international consulting firm will be engaged to provide these services. The selection and engagement of consultants will be done in accordance with ADB's *Guidelines on the Use of Consultants* and the procurement plan as agreed and amended from time to time. The quality- and cost-based selection method will be used, and simplified technical proposals invited from the short-listed firms.

Project Benefits and Beneficiaries

Special attention will be paid to social issues related to gender and beneficiaries in the project provinces, including ethnic minorities and environmental issues related to the project activities. A multistakeholder participatory diagnosis and design approach was adopted for project preparation to disseminate findings and project design. Key stakeholders, including relevant government agencies, research institutes, local administrations, farmer groups, other external funding agencies, and international nongovernment organizations, were consulted during project formulation. These stakeholders strongly support the project concept and recognize the importance of improved AST in Viet Nam.

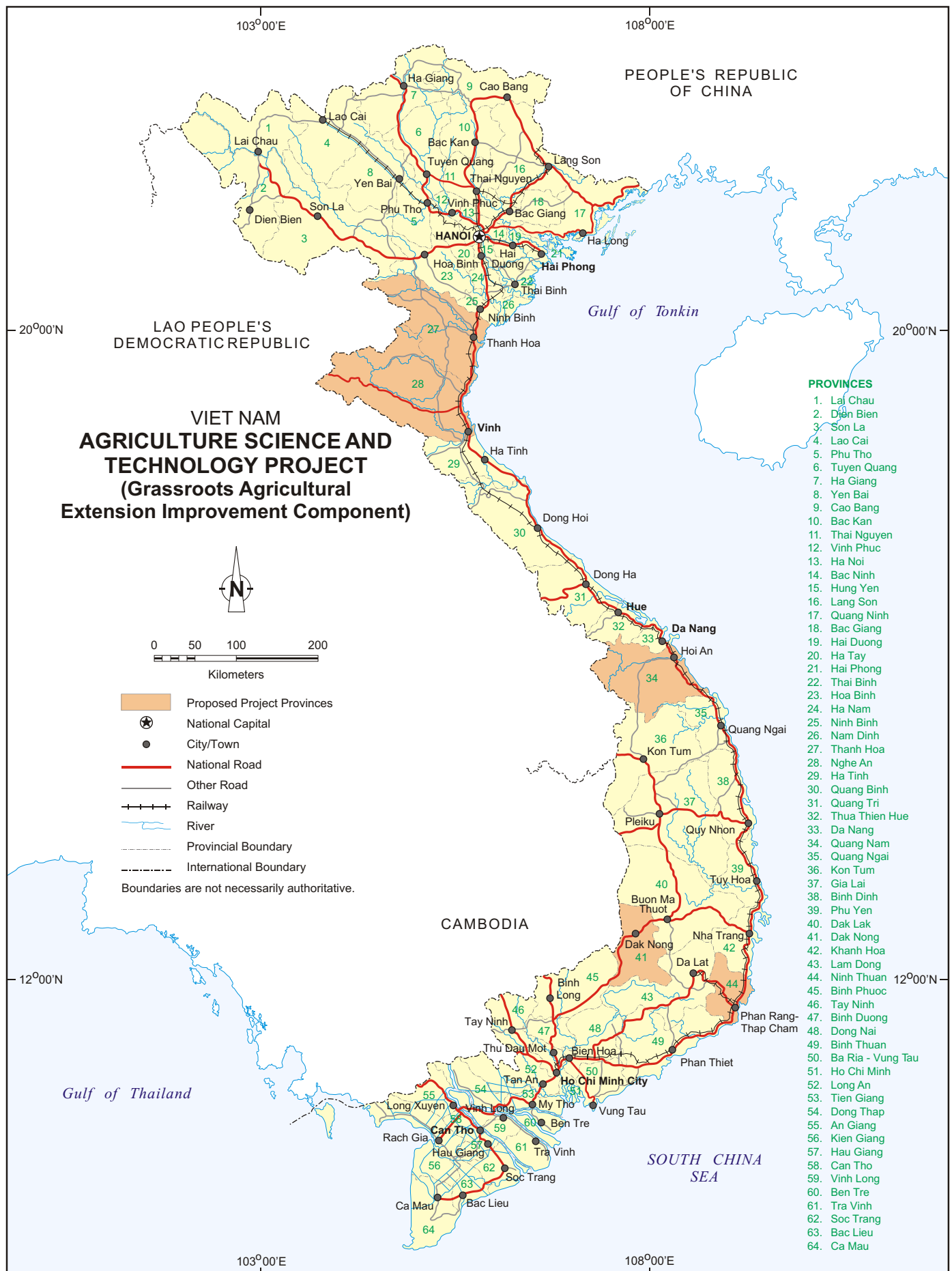
Risks and Assumptions

Major assumptions for effective project implementation include (i) continued Government commitment to strengthening the national AST system and to creating a favorable policy and institutional environment for the market-oriented growth of the agriculture sector, (ii) adequate provision of counterpart resources for maintaining sustainable project operations, and (iii) active participation of key stakeholders in planning and implementing grassroots extension services.

Concerns are often raised about the possible risk that researched technological advances in agriculture may benefit wealthy farmers at the expense of poor farmers. Wealthier farmers may have more resources to apply new technologies. However, access to agricultural science and technology is also critical for improving poor farmers' income and livelihood. In this context, special measures must be included to identify farmers' needs in poor communities. Under the Project, the selection criteria for research and extension contracts and demonstration trials will have pro-poor elements to reflect local farmers' needs, and give priority to socially sensitive activities in the provincial agricultural extension plans with regard to participation of women and ethnic minority groups. These criteria will be rigorously applied to ensure a positive impact on poverty reduction.

Other project risks may include (i) inadequate provision of counterpart resources for the project facilities, (ii) weak linkages

between agricultural research and extension, and (iii) inadequate stakeholder participation in project planning and implementation. The Government has assured ADB that it will provide adequate counterpart staff and resources to maintain sustainability of the project impact. ADB will continue its dialogue with the Government to ensure adequate financial resources for the upgraded equipment and facilities, strengthen the linkage between research and extension, and continue the project approach to promote active stakeholder participation.



I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan to the Socialist Republic of Viet Nam for the Agriculture Science and Technology Project. The design and monitoring framework is in Appendix 1.

II. RATIONALE: SECTOR PERFORMANCE, PROBLEMS, AND OPPORTUNITIES

A. Performance Indicators and Analysis

2. The gross domestic product (GDP) per capita in Viet Nam was estimated at \$622 in 2005, an increase of more than 20% from 2004. Poverty rapidly decreased during the last decade from 58% in the early 1990s to 23% in 2004.¹ Progress toward the country's Millennium Development Goals and targets has been fast; achieving poverty reduction targets ahead of schedule is making attainment of social development goals feasible. However, despite the rapid reduction in overall poverty incidence, poverty still remains a critical issue particularly in rural areas where about 75% of the country's population lives. Severe poverty exists in upland and remote areas and the gap in income between urban and rural areas is rapidly increasing. Poverty is particularly high in rural areas in the central region where increased efforts for rural development are required.

3. During 1995–2005, the agriculture sector in Viet Nam, including crops, livestock, fisheries, and forestry, expanded at an average annual rate of 4.1%. In 2005, the total production value of the sector was estimated at D175.0 trillion (\$10.9 billion) or about 21% of the national GDP.² The agriculture sector plays an important role in economic growth and poverty reduction, accounting for about 30% of the total export value and about 60% of the labor force. More than 50% of agricultural production value comes from the Red River and Mekong River deltas. Sector's growth in 2005 was estimated at about 4.0%.

4. In 2004, about 7.4 million hectares (ha) or 57% of the total cropped area of 12.9 million ha was under rice cultivation mainly in the two delta areas. Total paddy production was estimated at about 34.6 million tons with average yield of about 4.7 tons per ha. Other major crops include maize (910,000 ha), fruits (747,000 ha), vegetables (606,000 ha), cassava (372,000 ha), sugarcane (306,000 ha), and groundnuts (243,000 ha). Perennial industrial crops include coffee (514,000 ha), rubber (437,000 ha), and pepper (50,000 ha). Viet Nam was a net importer of rice in the late 1980s, but has become one of the largest rice exporters in the world, and also exports large quantities of commercial crops. This rapid growth is mainly attributed to the market-oriented reforms that recognize farm households as the key unit of production, liberalized land use rights and decision making on production and marketing, and increased investment in irrigation development and rehabilitation. Improved agriculture science and technology (AST) also played an important role, though its focus was more on increasing the quantity of production and less on the aspect of product quality and marketing.

5. With globalization, the agricultural setting is changing rapidly. Trade in agricultural products is becoming diverse, and the technological base for agriculture is increasingly built on advanced AST. Information technologies contribute to improvements in agricultural production and marketing. The private sector has taken a larger role in the generation and diffusion of new

¹ Asian Development Bank. 2006. *Country Strategy and Program (2007–2010): Viet Nam*. Manila.

² The figures for 2005 are preliminary estimates obtained from the General Statistics Office of the Government of Viet Nam.

technologies for seeds, agrochemicals, and veterinary medicines. In particular, multinational enterprises operate in various agricultural input and output markets. Under this global situation, increased production volume by itself cannot enhance the contribution of the agriculture sector to the national economy. Accompanying growth in production values through improvements in product quality and marketing is essential to ensure sustainable agricultural growth. In this context, strengthening of the country's AST system is urgently required.

6. The AST system in Viet Nam has been highly fragmented and characterized by duplication of efforts and programs. The ongoing Agriculture Sector Development Program (ASDP)³ addresses major structural weaknesses in AST, including (i) overlapping functions and uneven geographic distribution of research institutes, (ii) inadequate capacity of extension services in disseminating improved technology and research outputs, and (iii) ineffective support for agro-industrial development. In March 2003, the Asian Development Bank (ADB) assisted the Government in formulating a road map for AST,⁴ which calls for (i) detailed analysis and inventory assessments of the AST system, (ii) increased emphasis on client-oriented agricultural research and extension, (iii) coordination and partnership with key stakeholders in public and private sectors, and (iv) provision of comprehensive and quality services with increased focus on poor and disadvantaged farm households. The road map also stresses the need for increased investment in improving physical and human resources for AST. The proposed AST Project is included in ADB's country strategy and program (CSP) for Viet Nam, and fully takes into account the reform measures implemented under the ASDP and the main thrust of the road map.

7. In Viet Nam, the major contribution of AST in the 1990s was as a spillover from the accumulated benefits of agricultural research and development undertaken elsewhere. This resulted in the increased use of fertilizer and machinery. This source of growth will continue, but the need for new technology adapted to the country's specific agroecological conditions will increase. To become a significant source of agricultural growth, the national AST system needs to be modernized and become more effective. This will require capacity strengthening with improved equipment and facilities, and upgraded skills and capacity of human resources. It will also require new systems and management approaches, increasing the focus on the local needs of farmers and traders through client-oriented management of AST resources and institutions. A more detailed sector analysis is in Appendix 2.

B. Analysis of Key Problems and Opportunities

1. Government Objectives and Strategy

8. As part of the National 10-Year Socioeconomic Development Strategy (2001–2010), the Government plans to (i) foster agricultural diversification into higher value products and markets; (ii) increase factor productivity, value addition, and agroprocessing; (iii) improve product quality for domestic and export markets; (iv) facilitate technology development and dissemination through improved research and extension; (v) increase rural industries, infrastructure, and services; and (vi) reduce rural-urban income gaps. The Government strongly recognizes that more effective use of AST is required for technological advancement, which will ensure food security, promote agricultural diversification, and improve the quality of high-value agriculture

³ ADB. 2002. *Report and Recommendation of the President to the Board of Directors on Proposed Loans to the Socialist Republic of Viet Nam for the Agriculture Sector Development Program*. Manila. (Loans 1972/1973–VIE for a program loan of \$60 million, and project loan of \$30 million).

⁴ ADB. 2003. *Strategy and Road Map for Agriculture Science and Technology in Viet Nam*. Manila.

and agro-based products that are comparable with neighboring countries and trade competitors. Improvement of the national AST system is one of the highest priority policy issues.

9. MARD formulated its new 5-year plan in line with the Government's Socioeconomic Development Plan (2006-2010) to ensure sustainable and equitable growth of the agriculture sector in view of the country's rapid integration into international markets through its entry into the World Trade Organization and the implementation of the Free Trade Area Agreement of the Association of Southeast Asian Nations. The new plan will aim to (i) modernize the agriculture sector; (ii) strengthen AST; (iii) increase investment in the improvement of postharvest operations and biotechnology; (iv) promote agricultural trade and marketing; and (v) strengthen the system of sector management, thereby increasing agricultural household income, and ensuring sustainable and equitable sector growth.

10. To achieve these sector objectives, the Project will address the existing sector constraints in agricultural research, extension, and rural-based training through effective investment in the national AST system, which has been significantly low in Viet Nam (0.1% of agricultural GDP) as compared with Thailand (1.4%) and the People's Republic of China (0.4%). To promote production and marketing of high-value and high-quality agricultural products, access of farmers and agro-based enterprises to advanced AST and related knowledge and skills must be improved. In this context, the Project is critically important for strengthening the national AST system.

2. National Agriculture Science and Technology System

11. In Viet Nam, the national AST system for agricultural research, extension and training is complex, involving six ministries: MARD, Ministry of Science and Technology, Ministry of Education and Training, Ministry of Industry, Ministry of Fisheries, and Ministry of Natural Resources and Environment. This complex system is the result of various institutional changes in the agriculture sector since the 1970s. The Government fully recognizes the weaknesses of the existing AST system due to (i) complex organizational structures; (ii) old facilities and obsolete equipment; (iii) inadequate budgetary allocations for carrying out advanced AST programs and for upgrading equipment and facilities; (iv) lack of coordination among agencies and institutes, and duplication of efforts on similar topics; (v) lack of effective linkages between research and extension, and other support services; and (vi) uneven regional distribution of staff and facilities concentrated in the two delta regions. These issues often lead to a waste of scarce public resources for a variety of AST activities, weak institutional capacities, and lack of feedback from producers and traders.

12. Under the ASDP, MARD initiated policy and institutional reform measures related to the national AST system, including (i) reorganization of the national agricultural research system to rationalize the existing mandates and resources of research institutes, (ii) comprehensive revision of the Government decree on agricultural extension to institutionalize participatory and pro-poor agricultural extension services, and (iii) strengthening of provincial agricultural market information systems. The Government's approval and implementation of these measures were critical milestone events in the AST system as they actually led to the commencement of long-awaited reforms in the system. This process is still in transition, and formal ministerial circulars and regulations to institutionalize the reorganized system are being prepared with technical and advisory support of ADB technical assistance (TA).⁵ These ongoing reforms are expected to

⁵ ADB. 2005. *Technical Assistance to the Socialist Republic of Viet Nam for Strengthening Agriculture Science and Technology Management*. Manila (TA 4619-VIE).

provide an enabling environment for successful and effective implementation of the Project. A more detailed description of the issues related to the national AST system, and rationale for the proposed investment are included in the sector analysis in Appendix 2.

3. ADB's Policy and Operational Strategy

13. ADB's policy on agriculture and natural resources research⁶ aims to contribute to (i) poverty reduction, (ii) sustainable management of agriculture and natural resources, and (iii) increased agricultural productivity. The policy highlights the need for integrated farming systems with diversified crops; provision of support for farming in unfavorable environments, including upland and remote areas; and technology development and natural resources management based on stakeholder participation. The Project includes a number of features that are in line with the agenda of the ADB policy to strengthen the national AST system in Viet Nam as described in the project components (paras. 21–37).

14. The Project was formulated based on ADB's CSP for Viet Nam, approved in January 2002,⁷ and subsequent updates, which highlighted the country's need for rural development through improved agricultural productivity and diversification as an important measure to achieve the CSP's strategic objectives. The Project is included in the CSP update for 2006–2008, and in line with the new CSP (2007–2010) for Viet Nam (footnote 1), approved in October 2006, which aims at pro-poor economic growth.

4. External Assistance

15. Until the end of 2004, according to the MARD database, external funding agencies, including ADB, committed about \$2.14 billion to assist the agriculture sector in Viet Nam, of which about \$0.82 billion was in grant funds and \$1.32 billion in loans. As of 31 December 2005, ADB provided 20 loans to agriculture, irrigation, fisheries, and rural development in Viet Nam, amounting to \$892 million or 26% of the total loans to the country of about \$3.4 billion. ADB has been active in supporting policy and institutional reforms in the sector through ASDP, and in supporting projects for rural finance, and irrigation and flood control. Other external funding agencies in the sector include those of Australia, Denmark, Japan, and Netherlands; International Fund for Agricultural Development; and World Bank. ADB is active in ensuring adequate coordination with other multilateral and bilateral funding agencies through its Viet Nam Resident Mission. These external funding agencies and international research institutions will be regularly briefed on project implementation during loan review missions and regular dialogue on sector issues related to the ASDP. Appendix 3 shows recent initiatives of major external funding agencies in the agriculture sector.

5. Lessons

16. As of the end of December 2005, ADB had seven ongoing loans in the agriculture and natural resources sector. The progress of the ongoing ASDP is satisfactory with releases of the first and second tranches of the program loan despite an initial delay in the program start-up. Overall portfolio performance in Viet Nam was less encouraging in 2004 with implementation delays. Generic implementation issues in the country include lengthy decision-making processes and inadequate number of well-qualified and competent project management staff. These issues are being addressed jointly with the World Bank and other external funding

⁶ ADB. 1995. *The Bank's Policy on Agriculture and Natural Resources Research*. Manila (R253-95).

⁷ ADB. 2002. *Country Strategy and Program (2002–2004): Viet Nam*. Manila.

agencies at the time of the country portfolio review missions and during the consultative group meeting between the Government and external funding agencies.

17. ADB prepared five project performance audit reports for projects in the agriculture and natural resources sector, including three reports for projects during the 1970s. The program performance audit report for the Agriculture Sector Program loan,⁸ which was rated as successful, is very relevant and provides important lessons learned for the proposed Project, including the need for (i) better focus in the project scope for agricultural support services, and (ii) gradual sector reforms accompanied by timely provision of financial and TA assistance. These contributed to general success in introducing changes in the agriculture sector. The proposed Project is fully in line with this approach to accompany Government sector reforms.

18. Lessons from other projects of ADB and other external funding agencies mainly relate to the need for stronger linkages between research and extension, and for enhanced project readiness. These lessons are incorporated in the project design. The proposed project components will be implemented with improved linkages between agricultural research and extension and other support services at various stages through participation of key stakeholders in work planning and implementation of the Project, and in the selection of research and extension proposals to be funded under the Project. These measures will ensure that client demand is reflected in the project activities for agricultural research and extension. To enhance project readiness, advance action for consultant recruitment was taken, and the TA for strengthening managerial capacity of the staff involved in the national AST system was mobilized prior to loan approval (footnote 5).

III. THE PROPOSED PROJECT

A. Impact and Outcome

19. The Project aims to strengthen the national AST system in Viet Nam, thereby contributing to the sustainable and equitable growth of the agriculture sector and ultimately to reduced rural poverty. The Project will address critical issues involved in AST development, including the low level of linkages among key AST areas (agricultural research, extension, and training), and the gap in the capacity of physical and human resources for the national AST system. The Project will contribute to the resolution of these issues and increase the effectiveness and relevance of AST activities for clients to receive benefits of improved AST, and promote on-farm and off-farm sustainable use of natural resources. Inclusion of the three key AST areas under the Project as part of the integrated national system is vital if the full potential of AST development is to be realized.

20. The project scope will cover (i) client-oriented agricultural research and capacity strengthening, (ii) grassroots agricultural extension improvement, and (iii) rural-based technical and vocational training. The activities will be undertaken through close linkages among the components. Activities related to extension will mainly cover upland or remote areas in five provinces, including Dak Nong,⁹ Nghe An, Ninh Thuan, Quang Nam, and Thanh Hoa, while other project components have nationwide coverage. Specific project outcomes will include (i) improved capacity of physical and human resources for agricultural research, (ii) increased

⁸ ADB. 2002. *Program Performance Audit Report on the Agriculture Sector Program in Viet Nam*. Manila (PPA: VIE 25325).

⁹ The Government of Denmark is currently formulating a follow-up project to its ongoing Agriculture Sector Programme Support activities in several provinces including Dak Nong; the activities are expected to have strong synergy with the proposed ADB Project.

responsiveness of agricultural research activities to client needs, (iii) improved farmer access to participatory and pro-poor agricultural extension services, (iv) strengthened linkages between agricultural research and extension, (v) increased responsiveness of rural-based technical and vocational training to national sector goals, and (vi) strengthened capacity of rural-based agricultural training. The project scope has been carefully designed to avoid overlapping, and be technically complementary to the ongoing policy and institutional reforms under the ASDP. The design and monitoring framework for the Project is in Appendix 1.

B. Outputs

1. Client-Oriented Agricultural Research and Capacity Strengthening

21. This component will support (i) client-oriented research programs, (ii) training and postgraduate programs for staff involved in agricultural research, and (iii) upgrading of laboratory equipment of selected agricultural research institutes.

22. **Client-Oriented Research Programs.** The Project will promote agricultural research programs and timely application of research results to clients' practical uses. Prior to start-up of this activity, MARD, the Executing Agency for the Project, will establish a committee to examine and select research proposals for project funding on a competitive basis. The committee is proposed to have a total of 11 members, representing MARD's Science and Technology Council, other relevant government and non-government agencies, including agro-enterprises and rural associations.

23. The research proposals to be funded under the Project need to focus mainly on knowledge, information, and technologies relevant to the agroecological regions serviced by regional research institutes, and must be clearly in line with the selection criteria to reflect client needs, strategic relevance, and sustainability (para. 70 [ii]). A scoring system to emphasize social and pro-poor aspects, and promotion of environmentally sustainable agricultural and natural resource management systems, will be adopted. Although research subjects on upland and remote areas will be covered mainly by public institutes, private sector institutions can also apply for the program. The proposals need to involve at least one provincial agricultural extension center (PAEC) or extension advisory council as a coapplicant to ensure a linkage between research and extension.¹⁰ The maximum amount of a research proposal will be \$100,000. Reasonable laboratory or office equipment to undertake the proposed research can be included in the proposal. This activity is complementary to the ongoing Collaboration for Agriculture and Rural Development Program financed by the Government of Australia, which delivers large-scale and advanced agricultural research programs through a competitive bidding system. Coordination through the committee established for the Project will avoid the selection of repetitive and duplicative research proposals.

24. **Training of Research Staff.** To address the shortage of qualified research staff, the Project will provide on-the-job training and postgraduate and postdoctoral study programs for the staff of agricultural research institutes and other institutions of the national AST system. The purpose of the on-the-job training is to effectively utilize the existing and proposed laboratory equipment and facilities, and improve staff knowledge and skills to manage sophisticated facilities. During the first year of the Project, the Project's consultant team will conduct a needs

¹⁰ The field survey carried out during project formulation indicates farmers' strong demand for reliable information on agricultural research results and improved technology from regional and central research institutes and extension services.

assessment for on-the-job training. The assessment will build on the inventory of existing equipment and facilities compiled during project formulation under the project preparatory TA,¹¹ MARD's 2003 equipment utilization survey, and additional questionnaires to be given to selected institutions. Based on the results of the assessment, MARD will identify the subjects and formulate proposals for the type and duration of on-the-job training programs.

25. The Project will finance overseas study programs in key areas of agricultural research, including agricultural biotechnology, postharvest technology, product preservation for fruits and vegetables, economic policy and marketing, and natural resources management. No specific quota will be assigned to any of these subject areas or institutes. The application and selection processes will follow MARD's existing procedures, and a selection committee will be established with the participation of Science and Technology Council members, other relevant ministries, and key stakeholders. The specific selection of trainees is subject to ADB approval. The overseas study programs will support 20 trainees for doctoral courses for 3 years, 15 trainees for master's courses for 2 years, and 20 trainees for postdoctoral programs for 1 year. At least 10% of the total trainees will be women. To ensure that these study programs will be completed during the project period, applications will be invited in the first and second years of the Project for commencement in the following years. The Government will ensure that overseas study programs to be funded under the Project will be carried out in a manner acceptable to ADB. In particular, the Government will ensure that appropriate arrangements are developed so that the trainees will provide relevant services after returning from the programs. Such arrangements will be developed in consultation with ADB prior to implementation of the study programs. The human resource development plan for agricultural research was formulated under the ASDP and approved by MARD in October 2005. The proposed training program for researchers will contribute to implementation of the plan by providing opportunities for training and overseas study programs.

26. **Upgrading of Research and Laboratory Equipment.** The Project will provide and upgrade essential research and laboratory equipment of selected MARD agricultural research institutes to fill critical gaps in research due to outdated equipment. Institutes to be covered under the Project are indicated in Appendix 4. At the initial stage of project formulation, a total of 46 organizations involved in the national AST system, including research institutes, universities, and colleges, were surveyed and 37 organizations responded with a list of priority equipment and facilities. The Government's plan to finance new equipment and facilities, and ongoing and planned external assistance to these organizations were examined in collaboration with MARD for the screening of organizations to be funded under the Project and to avoid any overlap. During this process, MARD identified 10 high priority institutes, whose core functions and mandates comply with national sector goals and that are not covered under the ongoing and planned external assistance projects or the Government's investment plans. The equipment to be covered under the Project mainly constitutes basic equipment urgently required for the institutes' research programs.¹² This project component will not establish any new institutes or facilities, but will mainly support upgrading of existing equipment and facilities as prioritized in consultation with MARD and concerned institutes to minimize necessary incremental costs and ensure financial sustainability (para. 41). Small-scale civil works included under this component will not require land acquisition or resettlement. Based on the list of equipment prepared during project formulation, MARD (the central project management unit in collaboration with the

¹¹ ADB. 2005. *Technical Assistance to the Socialist Republic of Viet Nam for Preparing the Agriculture Science and Technology Project*. Manila (TA 4194-VIE).

¹² The detailed list of equipment and facilities for upgrading under the Project is included in the detailed cost tables (Supplementary Appendix C).

Department of Science and Technology) will conduct a detailed examination of the proposed procurement with assistance from the project implementation consultants. MARD will ensure that adequate knowledge and skills exist at the institutes for utilization of the procured equipment.¹³

2. Grassroots Agricultural Extension Improvement

27. The Project will improve farmers' access to participatory and pro-poor extension services, and strengthen linkages between agricultural research and extension services. Project activities for agricultural extension will be implemented in five project provinces (para. 20) based on selection criteria that include (i) a focus on the central region, where incidence of rural poverty is high, and synergy with other ADB-financed projects;¹⁴ (ii) existence or planned establishment of a provincial advisory council for agricultural extension, which includes as its members representatives of PAEC, regional research institutes, civil society organizations, farmer groups, and mass organizations; (iii) possible operational linkages with regional research institutes; (iv) high poverty incidence in the upland or remote districts in the province; and (v) willingness to participate in project activities. In the five provinces, the Project will promote decentralized agricultural extension systems based on a stakeholder participatory process through provincial advisory councils. Based on the performance of the project activities during the first 2 years of implementation, the Government and ADB may consider implementing extension activities under the Project in other provinces at the time of the midterm review. Under this component, the Project will support (i) strengthening of pro-poor provincial agricultural extension services, and (ii) promotion of contractual agricultural extension services.

28. **Pro-Poor Provincial Agricultural Extension Services.** The first activity to be implemented under this subcomponent will be the development of provincial plans for agricultural extension. PAECs will select priority districts in upland or remote areas, conduct farmers' needs assessments, and identify necessary training activities and potential local service providers through workshops and consultation meetings with national and local stakeholders. The individual provincial plan will be tailored to the situation and condition of each province, and provide a firm basis for the implementation of subsequent activities. The plan will have special sections for women and ethnic minorities to ensure their active participation.

29. Based on the needs assessments and the outcome of stakeholder consultations, the PAECs will prepare appropriate training programs for provincial extension staff and grassroots extension service providers with the assistance of the project implementation consultants. Priority subjects of the training programs identified during project formulation include (i) skills for farmers' business development and financial management; (ii) advanced agricultural science and technology; (iii) participatory and farmer-centered extension methodology and community organization, including experiences and lessons learned under the farmer field school approach; (iv) integrated pest management and other environmental concerns; and (v) awareness of gender mainstreaming and ethnic minority concerns.

30. The training programs for trainers will cover a total of 40 extension staff from the five project provinces. The number of staff from each province will be proportional to the size of the province. Two workshops for 20 staff each will be organized for 10 days, and promote the

¹³ The proposed implementation arrangements will not be affected by Decree No.115 issued in September 2005, which requires all research institutes of the Government to become financially autonomous by the end of December 2009. However, if different implementation arrangements are required in future, the Government and ADB will consider revising the proposed implementation arrangements, as required.

¹⁴ Including the Rural Infrastructure Project in the Central Region proposed for an ADB loan in 2007.

formation of 20 two-person teams of provincial trainers at completion of the workshops. The teams of trainers will work with resource persons and facilitate the training programs for grassroots district and commune extension service providers. These programs will require about 5 days and commence at the end of the first year of the Project. A total of about 270 programs will be organized during the project period; about 6,000 people are expected to participate in these programs, including at least 100 provincial extension staff, 400 district staff, and 5,500 commune service providers. The lessons learned and feedback from other relevant projects, including the ADB project financed under the Japan Fund for Poverty Reduction,¹⁵ will be fully taken into consideration for planning and implementing this project component.

31. In addition, the Project will support ongoing technical training programs organized by the PAECs for local extension staff and farmer groups on other priority subjects identified during the formulation of provincial plans. Training for farmers in poverty-stricken upland and remote areas will include an emphasis on food security and nutrition, particularly as an entry point for poor farmers to participate in the training programs. One overseas study tour for about 10 people to a country in Southeast Asia and a total of 34 in-country visits will be organized under the Project. The participants will be selected from the national, provincial, and district extension staff; selection will reflect the need for increased participation of women and ethnic minority population in consultation with the National Agricultural Extension Center (NAEC) and PAECs. The selection of participants in the overseas study tour is subject to ADB approval.

32. To enhance the impact of extension services, the information and communication capacity and networks of NAEC, PAECs, and district stations for agricultural extension in the project provinces will be strengthened under the Project through the procurement of basic equipment and provision of support for incremental operating costs during the first 2 years. The Project will also finance national mass media programs on subjects related to AST; this is an important part of the agricultural extension strategy to improve farmers' awareness, knowledge, and information on production and marketing. This will be implemented through contractual arrangements with radio and television stations with nationwide coverage.

33. **Promotion of Extension Contracts.** The Project will finance on-farm demonstration trials in the project provinces through contractual arrangements with regional or national research institutes to strengthen the provincial links between research and extension. Past efforts for these trials in each province should be fully considered to avoid overlapping and duplicating activities. Each contract will cover the fees for institutes, extension materials, and travel and accommodation costs. The Project will promote local contractual extension services to mobilize the trained grassroots extension service providers as a source of nongovernment extension services. These contracts will (i) cost up to the maximum of \$10,000, (ii) need to be in line with the provincial plan for agricultural extension of the respective project province (para. 28), and (iii) focus on the priority subjects included in the plan for improved knowledge and technology related to crop and livestock production and marketing.

34. To ensure pro-poor and gender-equal service delivery, the demonstration trials and extension services need to be implemented in the communes where at least 30% of households are classified as poor households in line with the national average for poverty incidence in rural areas and at least 40% of beneficiaries of these services are women. They will include efforts for community organization. The contracts to be awarded in the final year of project implementation need to ensure that at least 50% of beneficiaries are women farmers. The

¹⁵ ADB. 2005. *Grant Assistance to the Socialist Republic of Viet Nam for Community-Based Agricultural Extension and Training in Mountainous Districts*. Manila (JFPR 9071-VIE).

awarded contracts also need to specify that special considerations will be given to the participation and practices of ethnic minorities. A project-specific committee for the selection of extension proposals for funding will be established under the Project.

3. Rural-Based Technical and Vocational Training

35. The capacity of rural-based technical and vocational training schools will be strengthened by (i) improving technical knowledge, teaching and managerial skills of teachers and administrators and, curricula; and (ii) upgrading library and laboratory equipment and materials, teaching and laboratory facilities, and office equipment for school administration. Related civil works will be done on the existing compounds and will not require land acquisition and resettlement. Ten technical and vocational schools of MARD specializing in food processing technology, postharvest operations, and irrigation management have been selected based on consultations with MARD and criteria that include (i) activities focus on rural worker training in the agriculture sector, (ii) no substantial investment for rehabilitation in the past or high budgetary allocations, and (iii) no overlaps with the Vocational and Technical Education Project financed by ADB.¹⁶ Appendix 5 summarizes the training schools selected for the Project. The selected schools have significant student enrolments in agro-based technical training, postharvest, food processing, and mechanical engineering related to agriculture. Schools with student enrolments mainly in subjects like accounting and bookkeeping, and other trades that are not directly related to agro-based technical and vocational training, have not been selected for the Project.

36. To ensure that these training schools are geared toward national sector goals and priorities, necessary training programs and workshops will be provided for the teaching and administrative staff in close consultation with other relevant agencies, including the Ministry of Labor, Invalids, and Social Affairs; and Ministry of Education and Training. The subjects of these programs include (i) partnership between training institutions and agro-based industries; (ii) school planning and management; (iii) curriculum development and learner-centered teaching methods; (iv) development of teaching and learning resources, including biological demonstration models and audiovisual materials; and (v) mainstreaming of gender and ethnic minority issues. Under this component, the Project aims to improve teachers' ability to shift to learner-centered teaching methods and strengthen their technical competency and knowledge.

37. In accordance with the new curriculum guides developed under the Project, necessary equipment and materials as teaching resources and for library and laboratory purposes will be provided to the selected MARD training schools. These include (i) textbooks and other teaching materials, (ii) audiovisual equipment and materials, (iii) computer hardware and software, (iv) laboratory equipment and testing materials, and (v) food processing machines and equipment. Small-scale civil works costing less than \$500,000 per contract for renovation of classrooms, libraries, and laboratories will be carried out. These will not include buildings for school administration, student accommodation, and other facilities not directly related to teaching and learning purposes.

¹⁶ ADB. 1998. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Socialist Republic of Viet Nam for the Vocational and Technical Education Project*. Manila (Loan 1655–VIE). This loan provides support for only one school managed by MARD, Bac Giang Agricultural Secondary Technical School.

4. Project Management Support

38. Support for project management will be provided for the central project management unit (CPMU) and provincial project management units (PPMUs) in five project provinces, and to strengthen coordination between the CPMU and PPMUs. The Project will finance (i) incremental operating costs for the project staff, office utilities and supplies, vehicle operating costs, and travel expenses; (ii) project implementation consulting services; (iii) equipment for office computers, photocopiers, and communications; and (iv) one service vehicle for the CPMU. MARD will allocate its two existing vehicles to the Project, and provincial administrations will assign their existing vehicles to the project activities. No civil works will be undertaken for project management purposes.

C. Special Features

39. **Linkage with Policy and Institutional Reforms under the ASDP.** The Project was formulated in line with the national development priorities in the agriculture sector to strengthen capacity of the national AST system. It will build on the Government's past and ongoing achievements in its policy and institutional reform measures implemented under the ASDP (para. 12). The Project will fully consider appropriate feedback from the outcome of these ongoing reforms under the ASDP during the project period.

40. **Provision of Research and Extension Funds on a Competitive Basis.** The Project will support agricultural research and extension activities based on the selection of competitive proposals to ensure the implementation of client-oriented activities based on improved linkages between research and extension. This funding mechanism is relatively new for regional research activities and extension, although MARD does provide competitive grant funds for agricultural research programs. To minimize the implementation risk, ADB has provided advisory TA (footnote 5) to strengthen the capacity of AST management for improving project readiness in the national AST system. During project formulation, a series of consultation meetings were carried out with key stakeholders in the national AST system to solicit views and suggestions on the proposed competitive funding system, and to disseminate the project scope and design. Provision of contractual grassroots extension services aims to promote participatory and farmer-centered services based on Decree No. 56 introduced under the ASDP. The field survey conducted during project formulation identified strong demand for access to improved knowledge and technology among farmers, and their willingness to pay.¹⁷

41. **Measures to Ensure Sustainability of Project Impact.** The Project will not establish any new public institutions, and staff numbers and other incremental costs will not increase significantly. The Government has assured ADB that adequate counterpart funds will be provided after project completion for operation and maintenance of the equipment and facilities of research institutes, and technical and vocational schools to be upgraded under the Project (para. 70 [i]). New equipment will require consumable materials for which the Project includes provisions for initial stocks of supplies equivalent to 10% of the value of the equipment. These stocks are expected to sustain operations during the project period, and allow demonstration of effective utility of the upgraded equipment and facilities to support increased budget provision and funding through cost-recovery research contracts. The ongoing TA (footnote 5) aims to strengthen managerial capacity, and strategy and business plan development of the research institutes, thereby enhancing project sustainability.

¹⁷ In selected provinces, community veterinary workers currently provide fee-based extension services for small-scale livestock production.

42. **Land Acquisition and Resettlement.** The upgrading of facilities to be financed under the Project will be carried out on the existing compound of research institutes and training schools. Some new classrooms and laboratories will be constructed for the training schools. Such construction will have a maximum of about 1,200 square meters on the existing compounds and will not require land acquisition and resettlement.

43. **Social Considerations.** The component for grassroots agricultural extension will be implemented in the five project provinces where the incidence of rural poverty is high and ethnic minority groups constitute a high proportion of population in upland or remote districts. Individual provincial agricultural extension plans will be formulated at project inception through consultations with a wide range of key stakeholders in the provinces. Action plans have been prepared under the Project for gender mainstreaming and indigenous people's development during project formulation; their recommendations will be adopted in the project activities.

D. Project Investment Plan

44. The project investment cost is estimated at \$40.0 million equivalent, including taxes and duties of \$2.62 million, and is summarized in Table 1 and detailed in Appendix 6.

Table 1: Project Investment Plan
(\$ million)

Item	Amount ^a
A. Base Cost^b	
1. Client-Oriented Agriculture Research and Capacity Strengthening	15.74
2. Grassroots Agricultural Extension Improvement	7.80
3. Rural-Based Technical and Vocational Training	9.04
4. Project Management Support	3.24
Subtotal (A)	35.82
B. Contingencies^c	3.56
C. Financing Charges during Implementation^d	0.62
Total (A + B + C)	40.00

^a Inclusive of taxes and duties to be financed by the Government, amounting to \$2.62 million.

^b In mid 2005 prices.

^c Physical contingencies computed at 10% of the base cost for civil works, materials, training, and operating costs. No price contingency for foreign exchange costs is considered for 2006–2008 and about 0.6% per year for 2009–2010. Price increase of 5% per year is assumed for local currency costs during the project period.

^d Including interest during project implementation.

Sources: Asian Development Bank. 2005. *Technical Assistance to the Socialist Republic of Viet Nam for Preparing the Agriculture Science and Technology Project*. Manila (TA 4194–VIE); and Asian Development Bank estimates.

E. Financing Plan

45. The Government has requested a loan of \$30.0 million equivalent (75% of the total project cost) from ADB's Special Funds resources to help finance the Project. The loan will have a 32-year term, including a grace period of 8 years, and an interest charge of 1.0% per annum during the grace period and 1.5% thereafter. The Borrower will be the Socialist Republic of Viet Nam. The balance of \$10.0 million will be financed by the Government for salaries of project staff, other operating costs, part of the training costs, and taxes and duties. The financing plan is summarized in Table 2, and details are in Appendix 6. The loan will be used over 5 years.

Table 2: Financing Plan
(\$ million)

Source	Total	Percent
Asian Development Bank	30.0	75.0
Government	10.0	25.0
Total	40.0	100.0

Sources: Asian Development Bank. 2005. *Technical Assistance to the Socialist Republic of Viet Nam for Preparing the Agriculture Science and Technology Project*. Manila (TA 4194–VIE); and Asian Development Bank estimates.

F. Implementation Arrangements

1. Project Management

46. MARD, the Executing Agency for the Project, will be responsible for overall project implementation, and establish a CPMU in its Agricultural Projects Management Board. The CPMU will be headed by a project director appointed by MARD, and include at least a deputy head, planning officer, finance and accounting officer, monitoring and evaluation officer, procurement officer, and other necessary support staff on a full-time basis. The CPMU will oversee day-to-day project implementation, and ensure interdepartmental coordination within MARD at the central level under appropriate technical guidance of (i) the Department of Science and Technology for the client-oriented agricultural research and capacity strengthening component, (ii) NAEC for the grassroots agricultural extension improvement component, and (iii) the Department of Organization and Personnel for the rural-based technical and vocational training component. The CPMU will also be primarily responsible for central-level procurement, consultant recruitment, fund disbursements, and provision of support for the PPMUs.

47. A PPMU will be established under the provincial department of agriculture and rural development in each of the five project provinces before loan effectiveness. Each PPMU will be headed by a PPMU manager, and have a planning officer, monitoring and evaluation officer, accountant, and other necessary supporting staff. The PPMU will be responsible for overall management and supervision of the project activities related to agricultural extension in the province, including contractual arrangements for service delivery, finance and project accounting, procurement, monitoring and evaluation, and reporting. The PPMU will (i) maintain effective provincial coordination among the relevant provincial departments, PAEC, regional research institutes, and other key stakeholders; and (ii) ensure proper management of provincial activities according to the agreed implementation schedule. Project management units may be established at participating research institutes, and technical and vocational training schools, if required and deemed appropriate, to facilitate the Government's decentralization policy for project implementation and management.

48. Prior to loan effectiveness, the Government will establish a project steering committee (PSC) to facilitate interministerial coordination and provide overall policy guidance. The PSC will be headed by the vice minister of MARD in charge of science and technology matters, and include representatives of concerned MARD departments, Ministry of Education and Training, Ministry of Finance, Ministry of Planning and Investment, Ministry of Science and Technology, State Bank of Viet Nam, and the project provinces. The representatives of farmers' associations and other stakeholders will participate in the PSC meetings as required.

2. Implementation Period

49. The Project will be implemented over 5 years from January 2007 to December 2011. Planning for the training programs for agricultural research and extension staff, formulation of provincial plans for pro-poor extension services, and preparation of documents for procurement and staff recruitment will be initiated immediately after loan effectiveness. Appendix 7 provides the implementation schedule.

3. Procurement

50. Procurement of civil works, equipment, and materials will be mainly carried out by the CPMU in accordance with ADB's *Procurement Guidelines* and the procurement plan as agreed and amended from time to time, and will follow the relevant procedures and regulations of the Government. The CPMU will be responsible for formulating contract packages, preparing bid documents, evaluating bids, and awarding contracts satisfactory to the Government and ADB. Civil works for the Project are expected to be in small packages costing less than \$500,000, and procured under national competitive bidding procedures satisfactory to ADB. Selection and engagement of contractors will be subject to ADB's prior approval. These civil works will not require resettlement or land acquisition. Contract packages for equipment and materials are likely to be less than \$500,000. Supply contracts that are likely to exceed \$100,000 but less than \$500,000 will be procured through national competitive bidding. Universities and other specialized institutions will be directly contracted for the overseas study programs as there will be a limited number of institutions to provide post-graduate courses on the relevant specialized subjects.

51. Selection of research and extension contracts will be done by the respective selection committees to be established under the Project and assisted by the CPMU for regional research contracts, and by the PPMUs for provincial research and extension contracts. MARD will submit the evaluation reports on the selection of research contracts costing more than \$50,000 to ADB for approval. The procurement plan is in Appendix 8.

4. Consulting Services

52. The Project will require a team of consultants, including 29 person-months of international and 96 person-months of national consultants in the fields of (i) agricultural research management, (ii) agricultural extension management, (iii) agricultural vocational training, (iv) social development, (v) environmental assessment, (vi) financial management, and (vii) monitoring and evaluation. An international consulting firm will be engaged to provide these services. The international agricultural research management specialist will act as the team leader. The selection and engagement of consultants will be done in accordance with ADB's *Guidelines on the Use of Consultants* and the procurement plan as agreed and amended from time to time. The quality- and cost-based selection method will be used, and simplified technical proposals invited from the short-listed organizations. The outline terms of reference and person-months of these consulting services are in Appendix 9. To enhance project readiness, an advance action on consultant recruitment is being carried out to avoid initial delays in the start-up of project activities in the field.

5. Anticorruption Policy

53. ADB's anticorruption policy¹⁸ was explained to and discussed with the Government. Consistent with its commitment to good governance, accountability, and transparency, ADB reserves the right to investigate, directly or through its agents, any alleged corrupt, fraudulent, collusive, or coercive practices relating to the Project. To support these efforts, relevant provisions of ADB's anticorruption policy are included in the Loan Agreement and will be incorporated in the bidding documents. In particular, all contracts financed by ADB in connection with the Project will include provisions specifying the right of ADB to audit and examine the records and accounts of MARD and all contractors, suppliers, consultants, and other service providers as they relate to the Project. Loan processing missions of ADB emphasized the section on fraud and corruption added to ADB's *Procurement Guidelines*, and the need for strengthening financial control and management particularly for provinces and districts. ADB loan review missions will conduct regular verification of the project statements of expenditures.

6. Disbursement Arrangements

54. The Government will open a project imprest account at a commercial bank satisfactory to ADB immediately after loan effectiveness; it will be managed by the CPMU. An initial amount will be deposited into the account based on the projected expenditures for the next 6 months, but will not exceed \$1 million. In view of the difficulties encountered in provinces in past ADB projects, a second generation imprest account will be established at the provincial treasury of each project province to ensure proper management of the provincial accounts and the accounts of the project management units of the participating research institutes, and technical and vocational training schools, which may be established if required. Loan proceeds will be made available from the central project account to the provincial project accounts. The initial amount to each provincial account will be based on the projected expenditures for the next 6 months, but will not exceed \$50,000. The provincial imprest accounts are required for locally purchased equipment and materials, contractual services, and small-scale training activities at geographically dispersed locations in the five project provinces, and will be managed by the PPMUs. Each PPMU's expenditures are subject to endorsement by the respective provincial treasury. The imprest accounts will be established, managed, replenished, and liquidated in accordance with ADB's *Loan Disbursement Handbook* and the financial regulations of the Government. The accounts will be liquidated and replenished according to ADB's statement of expenditures procedures for payments below \$50,000 based on withdrawal applications submitted to ADB from time to time.

7. Accounting, Auditing, and Reporting

55. The CPMU and PPMUs will separately maintain records on project accounts in a manner that allows identification of expenditures under the Project, and have them audited annually by auditors acceptable to ADB and in accordance with sound auditing principles. The annual audit report should include the auditor's opinion on the imprest accounts and the statement of expenditures operations of the CPMU and PPMUs. Certified copies of the audited reports will be submitted to ADB, in English, within 6 months after the end of each fiscal year. The CPMU will prepare quarterly progress reports on overall project implementation, services provided, implementation issues, and recommended measures for improvement; and submit them to the PSC and ADB within 30 days after the end of each quarter. The format for progress reports will be agreed between the Government and ADB at project inception. The Government

¹⁸ ADB. 1998. *Anticorruption*. Manila.

will also prepare and provide to ADB a midterm review report at the end of the second year of project implementation and a project completion report within 3 months of project completion. These reports will be in a form and have details satisfactory to ADB.

8. Project Performance Monitoring and Evaluation

56. The CPMU will be responsible for setting up an appropriate system to monitor and evaluate project performance and impact as part of MARD's management information system with assistance from the project implementation consultants. Some baseline data and information on environmental and social aspects of the five project provinces have been developed through detailed field surveys during project formulation and will be used to develop the monitoring system. The social impact indicators developed and used for the Japan Fund for Poverty Reduction project (footnote 15) will be fully taken into account. These data and indicators will be disaggregated by gender and ethnicity as required.

9. Project Review

57. The Government and ADB will jointly conduct reviews of project implementation, generally on a semiannual basis. The CPMU will organize PSC meetings in conjunction with the project review. Based on the field review and consultations with the relevant agencies of the Government and key stakeholders, the Government and ADB will identify critical issues in project implementation and agree on necessary measures to resolve such implementation issues. In addition to regular project review, the Government and ADB will jointly undertake a comprehensive midterm review on project performance and impact during the third year of project implementation. The project completion review will be carried out upon project completion based on the terms of reference to be agreed between the Government and ADB.

IV. PROJECT BENEFITS, IMPACTS, ASSUMPTIONS, AND RISKS

A. Benefits

58. In addition to the strategic importance of AST for the sustainable and equitable growth of the agriculture sector, the Project is expected to generate two distinct streams of economic benefits to the sector through (i) more client-oriented agricultural research and extension services, and (ii) improved capacity of rural-based technical and vocational training. Direct beneficiaries will be farmers and the selected institutions involved in the AST activities, including agricultural research institutes, extension centers, and rural-based technical and vocational training schools.

59. The Project will provide incremental and replacement equipment and facilities that will be used in combination by researchers and other users. Since the Project will strengthen the overall capacity of the research and extension services, and does not support specific research and extension programs, attempts to disaggregate the benefit and cost streams to individual financing sources would be arbitrary. The nature of AST activities and the required time lag for the generation of benefits need to be taken into account in estimating the overall economic impact of investment for improved AST activities. Past studies indicate high returns to AST investment with a median value of 37%.¹⁹ Other studies based on adaptive research and extension activities in Viet Nam and in other countries also indicate that average rates of return

¹⁹ ADB. 2000. *Special Evaluation Study on the Policy Implementation and Impact of Agriculture and Natural Resources Research*. Manila (SST: STU 2000-17).

range from 30% to 50%. Although the quantitative estimation of direct economic benefits is difficult, highly positive economic benefits are expected from improving the national AST system with its potential economic rate of return in the range of 30–50% estimated based on a comparative and empirically grounded approach. At present, public financing is critical to promote more sustainable AST activities, such as fee-based research and extension services. Long-term sustainability of these services will depend on the demonstration and dissemination of benefits so that farmer groups, local governments, or others develop ways to fund them.

60. Under the component for rural-based technical and vocational training, the Project aims to improve the quality of graduates from 10 selected rural-based technical and vocational schools of MARD, which have substantial student enrolments in courses on agro-based technical training, postharvest operations, and agribusiness. The economic benefits of this training to society as a whole can be approximated by the private income streams received by trainees. This approach to economic analysis is the same as for the ongoing Vocational and Technical Education Project of ADB (footnote 16) and for other education projects. On the basis of assumptions about the number of new and existing graduates from the 10 institutions, their employment rates, and levels of remuneration, the economic internal rate of return for the component is estimated at 31% for the base case scenario. Sensitivity and quantitative risk-based analyses confirm that these returns are robust under a range of adverse circumstances in which costs may increase or benefits decrease.

61. The distributional aspects of the Project also need to be considered qualitatively. During project formulation, the need for special measures to incorporate poverty focus and pro-poor AST mechanisms into the project design was fully considered. The five project provinces selected for the agricultural extension activities have a high incidence of poverty and high proportions of ethnic minority population in upland and remote districts. However, that poverty focus is accomplished by more than simply selecting areas with a high incidence of poverty. Based on ADB's dialogue with key stakeholders during project formulation and in relation to the ongoing ASDP, provision of pro-poor mechanisms through the use of participatory planning approaches and strengthening of grassroots extension services has been incorporated so that the national AST system will become more responsive to farmers' demands than a simple, top-down distribution of knowledge. The project components for agricultural research and grassroots extension improvement incorporate these factors into the design. In addition, provision of a new framework for pro-poor extension services under the ongoing ASDP is expected to enhance the positive project impact on poverty reduction. A more detailed description of economic benefits and sustainability is in Appendix 10.

B. Impacts

62. A social assessment was conducted, based on existing study reports and rapid rural appraisals undertaken from December 2004 to February 2005 in the five project provinces, to examine the livelihood and farming conditions of rural households. During the rural appraisals, special attention was given to analyzing the situation of ethnic minorities and operations of local extension services. All the data and information were gathered through focus group discussions and interviews with key stakeholders in agricultural extension and village leaders. The summary poverty reduction and social strategy is in Appendix 11.

63. Traditional farming knowledge does not always allow people to move away from chronic poverty and vulnerability. The effective use of AST knowledge and skills can play a crucial role in promoting farming practices that will help smallholder farmers ensure food security and increase their household cash income. The selection criteria for the research and extension

proposals to be funded under the Project will ensure inclusive social development by selecting proposals that address the needs of the poor and disadvantaged groups of farmers in upland or remote areas. In line with the Government's Decree No. 56 issued in 2005, the Project will promote the concept of decentralized extension services and decision making for effective service delivery in upland and remote communities.

64. While women constitute half of the total agricultural labor force, the situation of women in the sector is often characterized by imbalances in the regulation of civil transactions, provision of credit, and delivery of agricultural support services. Despite the important role that women play in the agriculture sector, various disparities exist in women's access to services and productive resources. While women work in most agricultural activities, they represent about 25% of the participants in training programs for animal husbandry and 10% of those for cultivation. Women extension workers constitute about 30% of all workers. The project impact on women is expected to be positive with a gender action plan to increase awareness of gender issues and to promote women's AST knowledge and skills. The project performance and social impact will be monitored through the monitoring and evaluation system based on gender- and ethnicity-disaggregated data and information, and regularly assessed every year.

65. In Viet Nam, more than 50 ethnic minority groups can be identified, and they have a high degree of diversity in terms of language, lifestyle, kinship, belief, and farming practices. The five project provinces covered under the grassroots agricultural extension improvement component have about 15 ethnic minority groups, including Thai, Tho, H'mong, and Cham. They constitute 7–20% of the total provincial population, but make up a higher proportion in upland and remote districts. Specific measures have been identified and will be fully taken into account in each project component to ensure that the needs and practices of the ethnic minority population will be fully considered under project activities.

66. An initial environmental examination was carried out for the Project in accordance with the guidelines of the Government and ADB for environmental assessments. The environmental screening revealed that the environmental impact of any single activity is generally minor. To address any possible adverse environmental impact, the Project will ensure that environmental assessments will be carried out in line with Government regulations for the relevant categories of civil works during the design phase, and an environmental monitoring plan will be implemented. A summary environmental analysis is in Appendix 12, and a summary initial environmental examination in Supplementary Appendix F.

C. Risks

67. ADB's study (footnote 19) notes legitimate concerns that research-led technological advances in agriculture may benefit wealthy farmers at the expense of poor farmers. Wealthier farmers may in fact have more resources to apply new technologies. In this context, special measures must be included to identify farmers' needs in poor communities. Under the Project, the selection criteria for research and extension contracts and demonstration trials will have pro-poor elements to reflect local farmers' needs, and give priority to socially sensitive activities in the provincial agricultural extension plans with regard to participation of women and ethnic minority groups.

68. Other project risks include (i) inadequate provision of counterpart resources for operation and maintenance of equipment and facilities upgraded under the Project, (ii) weak linkages between agricultural research and extension, and (iii) inadequate stakeholder participation in planning and implementing AST activities under the Project. The Government has assured ADB

that it will provide adequate incremental budget to maintain sustainability of project impact. ADB will continue its dialogue with the Government to ensure adequate financial resources for the upgraded equipment and facilities.

69. To strengthen the linkage between research and extension, the selection criteria for agricultural research proposals will require the inclusion of either the PAEC or provincial advisory council for agricultural extension so that relevant local stakeholders are involved in the planning and implementation of the research activities. This will ensure that local demand is reflected in the proposed research and extension contracts. Similarly, inclusion of provincial advisory councils in the formulation of provincial agricultural extension plans will facilitate the process of stakeholder consultations in the project activities.

V. ASSURANCES

A. Specific Assurances

70. In addition to the standard assurances, the Government has given the following assurances, which are incorporated in the legal documents.

- (i) To maintain sustainability of project impact after completion, the Government will ensure that it will provide adequate counterpart staff and funds for operation and maintenance of the equipment and facilities upgraded in the selected agriculture research institutes under the Project. The Government will further ensure that such institutes will provide adequate staff and funds for operation and maintenance after their transformation into self-financed organizations in accordance with Decree No. 115, issued in 2005.
- (ii) The Government will ensure that the criteria to be applied for the selection of research proposals to be financed under the Project include (a) appropriateness to the local client needs based on the results of participatory rural assessments; (b) relevance to the national sector goals, strategies, and priorities; (c) technical and financial viability and sustainability; (d) linkage with agricultural extension and effective mechanisms for participatory technology development and dissemination; and (e) compliance with social and environmental requirements.
- (iii) The Government will ensure that overseas study programs to be funded under the Project will be carried out in a manner acceptable to ADB. In particular, the Government will ensure that appropriate arrangements are developed so that the trainees participating in the overseas study programs will provide relevant services after returning from the programs. Such arrangements will be developed in consultation with ADB prior to the implementation of the study programs. At least 10% of the total number of trainees will be women.
- (iv) To ensure pro-poor service delivery, the Government will ensure that the demonstration trials and extension services under the Project will be implemented in poor communes where at least 30% of households are classified as poor households.
- (v) The Government will ensure that the project activities will be implemented in line with the proposed gender action plan. In particular, the proposed gender action plan will be reflected in the provincial plans for agricultural extension to be developed in conjunction with the Project. The extension contracts to be funded under the Project will have provisions that at least 40% of beneficiaries of these services are women. The contracts to be awarded in the final year of project implementation will have provisions that at least 50% of beneficiaries are women.

- (vi) The Government will ensure that the project activities will be implemented in line with the proposed indigenous peoples action plan, and that the proposed indigenous peoples action plan will be reflected in the provincial plans for agricultural extension to be developed in conjunction with the Project. All extension contracts to be funded under the Project will give special consideration to the participation and practices of ethnic minority population.
- (vii) The Government will ensure that civil works to be financed under the Project will not require resettlement or land acquisition. If resettlement or land acquisition is unavoidable, the Government will prepare a resettlement plan in accordance with ADB's policy on involuntary resettlement²⁰ and submit it to ADB for approval prior to awarding the concerned civil works contract.
- (viii) To address any possible adverse environmental impact, the Government will ensure that (a) environmental impact assessments will be carried out in line with Government regulations for the relevant categories of civil works during the design phase, and (b) recommendations of the initial environmental examination and the environmental monitoring plan for the Project will be effectively implemented.

B. Conditions for Loan Effectiveness

71. A provincial project management unit (para. 47) will be established under the provincial department of agriculture and rural development in each of the five project provinces before loan effectiveness.

72. An interministerial project steering committee (para. 48) will be established with representatives of the relevant ministries and agencies as its members before loan effectiveness.

VI. RECOMMENDATION

73. I am satisfied that the proposed loan would comply with the Articles of Agreement of ADB and recommend that the Board approve the loan in various currencies equivalent to Special Drawing Rights 20,198,000 to the Socialist Republic of Viet Nam for the Agriculture Science and Technology Project from ADB's Special Funds resources with an interest charge at the rate of 1.0% per annum during the grace period and 1.5% per annum thereafter; a term of 32 years, including a grace period of 8 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft Loan Agreement presented to the Board.

Haruhiko Kuroda
President

17 November 2006

²⁰ ADB. 1995. *Involuntary Resettlement*. Manila.

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets/Indicators	Data Sources/Reporting Mechanisms	Assumptions and Risks
Impact Sustainable and equitable agricultural growth achieved	<ul style="list-style-type: none"> Aggregate value added and exports of the agriculture sector to increase at about 3.0–3.2% and 12.3–14.3% respectively per annum during 2006–2010 in line with the 5-Year Socioeconomic Development Plan Poverty incidence in rural areas decreased from 45% (2003) 	<ul style="list-style-type: none"> National accounts National agricultural statistics (annual yields, production volume and value, varieties of crops and other products, and other relevant data) Poverty assessments Monitoring by the Ministry of Agriculture and Rural Development (MARD), and Ministry of Planning and Investment (MPI) 	Assumptions <ul style="list-style-type: none"> Macroeconomic stability maintained during the project period The country's agriculture sector continues to be effectively integrated into international markets Sustainable use of on-farm and off-farm natural resources
Outcome National system of agriculture science and technology (AST) strengthened	<ul style="list-style-type: none"> Client-oriented AST system in place with improved and more effective mechanisms for technology dissemination Closer linkages established between research and extension activities Multiple extension services in place, involving various service providers 	<ul style="list-style-type: none"> Monitoring by MARD and MPI Project review missions of the Asian Development Bank (ADB) Project monitoring system and progress reports Regular dialogue with key stakeholders involved in the national AST system, including extension centers and research institutes 	Assumptions <ul style="list-style-type: none"> Continued Government commitment to the market-oriented agriculture sector in line with the national socioeconomic development plans Continued Government policies and actions to streamline AST institutions to respond to the national development goals Agriculture market information systems effectively implemented
Outputs 1. Capacity of physical and human resources for agricultural research improved	<ul style="list-style-type: none"> Efficiency and usage of laboratory equipment increased substantially Research staff with relevant postgraduate qualification increased from 20% in 2003 to 30% in 2008 in line with the human resource development plan for agricultural research 	<ul style="list-style-type: none"> Monitoring by MARD and MPI ADB review missions Project monitoring system and progress reports, including inventories of equipment and staff lists Midterm and completion reviews of the Project Regular dialogue with key stakeholders involved in the national AST system 	Assumptions <ul style="list-style-type: none"> The Government's plan for research institute reorganization implemented Skilled staff retained in the national AST system Adequate financial resources for proper operation and maintenance Risk <ul style="list-style-type: none"> Inappropriate intervention into procurement and selection of trainees

Design Summary	Performance Targets/Indicators	Data Sources/Reporting Mechanisms	Assumptions and Risks
2. Agricultural research activities made more responsive to client needs	<ul style="list-style-type: none"> • Research and technology transfer contracts undertaken in provinces of different agroecological regions • Not less than 40% of the value of research contracts addressing needs of upland or remote communities 	<ul style="list-style-type: none"> • Monitoring by MARD and MPI • ADB review missions • Project monitoring system and progress reports, including contract awards • Midterm and completion reviews of the Project • Regular dialogue with key stakeholders involved in the national AST system 	Assumptions <ul style="list-style-type: none"> • Government procedures and regulations improved for the client-oriented AST system of the country • Increased awareness among the stakeholder agencies about the need for client-oriented agricultural research activities
3. Farmers' access to participatory and pro-poor agricultural extension improved	<ul style="list-style-type: none"> • Needs-based provincial planning systems for agricultural extension established • Project extension activities implemented in upland and remote areas of the five project provinces • Not less than 40% of the value of extension contracts addressing needs of upland or remote communities 	<ul style="list-style-type: none"> • Monitoring by MARD and MPI • ADB review missions • Project monitoring system and progress reports, including assessment of poverty incidence and evaluation of training and seminar programs conducted under the Project • Midterm and completion reviews of the Project • Regular dialogue with key stakeholders involved in the national AST system 	Assumptions <ul style="list-style-type: none"> • Active participation of key stakeholders in local communities in planning and implementation of grassroots extension services • Effective linkage between research and extension maintained Risk <ul style="list-style-type: none"> • Inadequate finance made available for the extension services
4. Improved linkage of agricultural extension services with research strengthened	<ul style="list-style-type: none"> • Participation of provincial extension centers in regional research activities, including provincial research programs and field research trials • Practical linkages between farmer groups, extension service providers, and research institutes formalized • Effective mechanisms for increased stakeholder participation in extension services established 	<ul style="list-style-type: none"> • Monitoring by MARD and MPI • ADB review missions • Project monitoring system and progress reports • Midterm and completion reviews of the Project • Regular dialogue with key stakeholders involved in the national AST system 	Assumptions <ul style="list-style-type: none"> • Government procedures and regulations improved for effective linkages between research and extension • Increased awareness among local extension workers about the need to strengthen linkages with research activities

Design Summary	Performance Targets/Indicators	Data Sources/Reporting Mechanisms	Assumptions and Risks
5. Rural-based technical and vocational training made more responsive to national sector goals	<ul style="list-style-type: none">• Effective systems to link between schools and industries in place• Appropriate curriculum guidelines introduced to reflect national sector goals	<ul style="list-style-type: none">• Monitoring by MARD and MPI• ADB review missions• Project monitoring system and progress reports• Midterm and completion reviews of the Project• Regular dialogue with key stakeholders involved in the national AST system	Assumptions <ul style="list-style-type: none">• National curriculum guides developed in line with the national sector goals• School-industry councils provide effective guidance to schools• Labor market information effectively communicated to technical and vocational schools
6. Capacity of rural-based technical and vocational training strengthened	<ul style="list-style-type: none">• Average usage of school and laboratory equipment in the schools selected under the Project increased substantially• Average of about 90% of the graduates of the targeted schools enter into full-time employment	<ul style="list-style-type: none">• Monitoring by MARD and MPI• ADB review missions• Project monitoring system and progress reports• Midterm and completion reviews of the Project• Regular dialogue with key stakeholders involved in the national AST system	Assumptions <ul style="list-style-type: none">• Adequate financial resources provided for operation and maintenance of upgraded equipment and facilities
Activities with Milestones 1.1 Provision of laboratory facilities and equipment for research 1.2 Provision of training programs for staff and researchers of research institutes 1.3 Provision of the agricultural research fund 2.1 Establishment of formal linkages between farmer groups, extension service providers, and research institutes 2.2. Provision of training facilities and equipment for provinces and districts 2.3 Development of national and provincial extension contract systems with local service providers 3.1 Provision of school facilities and equipment 3.2 Revision of school curriculum guidelines			Inputs <ul style="list-style-type: none">• ADB \$30.0 million• Government \$10.0 million Procurement commenced by December 2007 Training programs to be initiated by December 2007 Establishment of the fund by December 2007 Issuance of circulars by June 2007 Procurement commenced by September 2007 Systems developed by December 2007 Procurement commenced by December 2007 Revisions to be completed by December 2008

SECTOR ANALYSIS

A. Current Issues in the Agriculture Sector

1. In Viet Nam, crops constitute about 59% of the total production value of the agriculture sector, followed by fisheries (19%), livestock (17%), and forestry (5%). Although more than half of the total cropped area is dominated by rice cultivation, production of agricultural crops is being rapidly diversified with increased production and export of commercial crops. The trend to diversify from food crop monoculture is expected to continue as the country's economy increasingly integrates with the world market through accession to the World Trade Organization and regional free trade agreements among the countries in Southeast Asia.

2. The growth of the agriculture sector over the past decade is the result of a combination of (i) market-oriented economic policy launched in 1986, (ii) public investment in irrigation systems, and (iii) increased land and labor inputs. The market-oriented reforms led to the progressive decontrol of prices and market functions, recognition of farm households as the key unit of production and marketing, and liberalized land-use rights. The recent sector growth was attained by the country essentially catching up with international and regional standard practices. However, continued agricultural growth will increasingly require new farming systems and more locally driven, productivity-based improvements for increased value of agricultural production.

3. To address this sector issue, the Government recognizes an urgent need for the effective use and application of advanced agriculture science and technology (AST) in agricultural production and marketing. Strengthening of the national AST system is required now for technological advancement to ensure food security, promote agricultural diversification; and improve the quality of high-value crop, livestock, and fishery products that are comparable with neighboring countries and trade competitors. This will address the needs of farmers and industries for better quality standards and delivery of agricultural and agro-based products,¹ thereby contributing to higher value-added in the agriculture sector and improved rural income.

4. Several policy constraints still limit the emergence of an open land market. Limitations on land transfers and land size constrain the availability and flexible use of agricultural land. Despite active lending by state-owned commercial banks, access to formal credit is limited in rural areas. A large proportion of farmers and small-scale enterprises still depend on informal financial sources for their funds. Improved rural access to reliable and effective financial services is urgently required. Capital investment in irrigation development absorbs more than half of the national budget for the agriculture sector. Huge losses of irrigation management companies, which thus underfund operation and maintenance activities, result in the deterioration of the existing irrigation systems and further losses in the state budget. Continued policy and institutional reforms are required to improve access to these critical resources for agricultural production.

5. As Viet Nam will be integrated into international markets, future growth of the agriculture sector will increasingly depend on postproduction activities (storing, processing, and marketing) and measures to fulfill more stringent market requirements. Agro-industries will play a vital role

¹ In Viet Nam, improved capacity of the national AST system would substantially improve product quality and safety, product differentiation, postharvest operations, and marketing. The recent growth in production and exports of various commercial crops (coffee, rubber, tea, pepper, groundnuts, and cashews) needs to be accompanied by improved research, extension, and training programs to strengthen the competitiveness of the country's agricultural and agro-based products in international markets.

in this aspect, and can lead to the development of export markets, which will then lead to the progressive diversification of industries and expansion of other sectors. However, trade, marketing, and processing of agricultural products are still heavily affected by underperforming state-owned enterprises (SOEs). The Government has gradually introduced measures to improve the performance of SOEs under the SOE Law, but favorable treatment of SOEs in terms of access to finance and other resources constitutes a serious obstacle for promoting viable private business opportunities in the country. Implementation of continued reforms for SOEs and market liberalization are required to strengthen the integration of improved postharvest systems in the agriculture sector. SOE issues will continue to be addressed through regular policy dialogue between the Government and Asian Development Bank (ADB) for updating ADB's country strategy and program, and for SOE reforms and improved corporate governance.

B. AST System and Funding

6. The AST system in Viet Nam has focused on high and sophisticated technology, often imported from outside and adapted in a way inappropriate to local practices and agroecological conditions. Even though this approach has generated increased production benefits, it has often been unable to adequately address the client needs of local farmers and traders, particularly in upland and remote areas. During the consultative process for project formulation, the importance of effective management and coordination of the national AST system was emphasized by key stakeholders at informant interviews, focus group meetings, and participatory workshops. At present, the Science and Technology Council of the Ministry of Agriculture and Rural Development (MARD) has general responsibility for overall management and coordination of the AST system. The council consists of more than 40 eminent researchers selected from major institutes and universities, and from different regions of the country.² As an increasing number of enterprises in agriculture and agro-based industries will constitute a major share in the Vietnamese economy, agricultural research and extension will have to respond to the needs of not only farmers but also of these agroenterprises. Thus, it will be essential to integrate research and extension with agro-based industries; the corporate sector is also expected to contribute to financing a share of the research and extension budget.

7. Agriculture constitutes about 6% of the total state budget. Beginning in the late 1990s, the Government embarked on an extensive decentralization program in public expenditures based on the 1996 State Budget Law.³ The 2002 State Budget Law provides provincial governments with considerable discretion in fiscal management. The share of provincial governments in total public expenditures increased from 26% in 1992 to 48% in 2002, and decentralization continues. Provincial governments appear to have reasonable capacity for fiscal management, particularly in the provinces where provincial people's committees have effective systems for monitoring and supervision. In line with this overall trend, the share of agriculture sector expenditures for local implementation increased from 43% in 1997 to 79% in 2002. Most of the agricultural extension services are being implemented and delivered by provinces. The new decree for agricultural extension (para. 18) is expected to increase provincial financial flexibility by promoting more cost-effective extension services and possible user fee contributions from local farmers.

² ADB. 2005. *Technical Assistance to the Socialist Republic of Viet Nam for Strengthening Agriculture Science and Technology Management*. Manila (TA 4619–VIE). This TA provides MARD with technical and advisory support to improve managerial skills of various AST institutions, including the Science and Technology Council of MARD.

³ The Government of Viet Nam and the World Bank. 2005. *Vietnam: Managing Public Expenditure for Poverty Reduction and Growth*. Hanoi.

8. With respect to agricultural research, the state budget is provided in various channels through central agencies like MARD and the Ministry of Science and Technology, provinces, and agricultural research institutes. Part of the budget is also provided for research programs and institutes through competitive bidding systems, contributing to improved program budgeting in agricultural research and providing opportunities for involving nongovernment research institutions in the national AST system. Underfunding of recurrent expenditures for staff salaries, operation, and maintenance is a problem for all AST areas, including agricultural research, extension, and training. This will need to be addressed in the regular dialogue on implementation of the proposed Project and on ADB's overall sector portfolio management review.

C. Ongoing Reforms in the National AST System

1. Agricultural Research

9. Since the late 1960s, the country's agricultural research system developed rapidly, and a relatively complete set of institutes was created and endowed with a large pool of experienced researchers, educated mainly in Eastern Europe. The main agenda for research included contributions to food security, production of diverse commodities, and increased exports. However, efficiency and effectiveness of agricultural research activities have been affected by a number of institutional and resource issues.

10. Viet Nam has a complex system of agricultural research, involving six ministries. In 2005, MARD alone had 25 research institutes with 113 subinstitutes and centers, and 6 universities. The annual budget for administration and regular operation of the MARD research institutes amounted to about D101.7 billion (\$6.3 million). The Government attempted to streamline the system in 1996 by merging several institutes, shifting the control of some institutes to SOEs, and converting other institutes to self-financing entities. However, this policy encountered difficulties as some research institutes and SOEs were reluctant to accept the proposed changes.

11. The Government fully recognizes the weaknesses of the existing system of agricultural research, which often results in a dispersal of scarce public resources, duplication of research efforts, weak capacity of research staff, and lack of feedback from producers and traders. The high concentration of the institutes in the two large delta regions (Red River and Mekong) has also resulted in an uneven distribution of research institutes and their stations, and limited the relevance of research results in other agroecological regions. A lower level of research activities has been undertaken for upland farming systems, which constitute more than three quarters of the country's land area. Furthermore, uncertainty surrounding the structure of the national agricultural research system has long made it difficult for research institutes to formulate their medium- to long-term plans, and undertake effective investment.

12. Most research institutes, established in the 1960s and 1970s, have not received adequate support for upgrading of facilities and equipment. While the proportion of government budget allocated to the national AST system has slightly increased in the last few years, many of the research institutes still suffer from insufficient state budget allocations. Outputs of research programs are often the results obtained from experiments or small-scale pilot activities. Extending them to large-scale production faces several difficulties due to the shortage of human and financial resources. During the survey carried out for project formulation, many MARD agricultural research institutes and laboratories commented that they urgently required

resources to upgrade facilities and replace obsolete equipment, and to improve institutional capacity to conduct more effective research programs to meet client needs.

13. Within the next 10 years, the agricultural research system is expected to face human resource constraints in terms of staff capacity. A large number of qualified senior scientists will leave the research system while the cadre of well-qualified scientists to take over their positions will be relatively small. Under the ongoing Agriculture Sector Development Program (ASDP),⁴ MARD formulated a detailed plan to implement the reorganization of the national agricultural research system, which was approved by the Government in September 2005. The plan aims to (i) ensure focused research activities through effective coordination among research institutes; (ii) carry out regionally oriented research programs, which are suitable for the respective agroecological regions; and (iii) make research activities more responsive to national sector goals and demands of producers and traders.⁵ MARD also stated in its Science and Technology Plan (2004) that its priority areas for research would include (i) plant and animal breeding, (ii) product preservation, (iii) agricultural policy and marketing, and (iv) natural resources management.

14. The Government's approval of the detailed plan was a significant step toward further rationalization of the agricultural research system and development of a more client-oriented system. Several institutes involved in crop research and genetic engineering were officially merged into the Viet Nam Academy of Agricultural Sciences. Under the ASDP, the Government promoted a competitive grant funding mechanism to finance agricultural research programs suited to the needs of different agroecological regions and client needs. Building on these reform efforts under the ASDP,⁶ the AST Project will provide financial support for the provision of competitive research grants and strengthening of institutional capacity and human resources for improved agricultural research.

2. Agricultural Extension

15. Development of agricultural extension services in Viet Nam is relatively new. The Government Decree No. 13 on the establishment of provincial, district, commune, and village public sector extension services was issued in March 1993, and provided implementation guidelines for the extension services in the field. In July 2003, the Government established the National Agricultural Extension Center (NAEC) to create an agency solely responsible for public agricultural extension services and ensure effective service delivery and coordination by concentrating scarce financial and human resources. At present, NAEC supervises about 3,200 specialized central, provincial, and district staff members, and employs part-time contractual workers, including about 7,500 commune extension workers and more than 100,000 village assistants. On average, there is one specialized extension staff member for every 3,650 farm households in the country. Public mass organizations such as women's, farmers' and youth unions contribute to the provision of extension support for local communities in the field. In addition, commodity-specific producer associations for coffee, tea, and cotton provide training on production technology and other services for farmers.

16. Accurately assessing the contribution of agricultural extension to farmers' adoption of improved agricultural knowledge and technology is difficult as the feedback from farmers during

⁴ ADB. 2002. *Report and Recommendation of the President to the Board of Directors on Proposed Loans to the Socialist Republic of Viet Nam for the Agriculture Sector Development Program*. Manila (Loans 1972/1973–VIE).

⁵ MARD. 2005. *Proposal on Reorganization of Science and Technology System under MARD*. Hanoi.

⁶ ADB. 2005. *Progress Report on the Agriculture Sector Development Program: Release of Second Tranche*. Manila (Loan 1972–VIE).

stakeholder consultations varied by region and province. However, access to advanced knowledge and technology is one of farmers' critical concerns. Other issues related to public agricultural extension services include (i) inadequate coverage due to the shortage of human and financial resources; (ii) dispersal of scarce financial resources due to continued use of high input subsidies; (iii) need for improved understanding about farmers' concerns related to agricultural knowledge and technology; (iv) weak technical capacity of grassroots extension service providers; and (v) need for appropriate modality and services suited to poor farmers, particularly in upland and remote areas. MARD recognizes that the past extension approaches were suited to the needs of relatively better-off farmers, who were able to afford increased agricultural inputs. Provision and visibility of extension services in poor communities and upland and remote areas was low, and pro-poor extension delivery needs to be promoted through more participatory and farmer-centered approaches. Technical and managerial capacity of provincial agricultural extension services and grassroots extension agents must be strengthened.

17. Under the ASDP, NAEC of MARD formulated and issued a ministerial circular to its provincial departments to assist provinces in forming advisory councils to increase participation of local stakeholders in planning and implementing agricultural extension services. The purpose was to promote more client-oriented extension services. Advisory councils for extension were established in about 40 provinces by October 2006, involving key provincial stakeholders such as representatives of farmers' associations and cooperatives, women's unions, regional research institutes, provincial agricultural extension centers, nongovernment organizations (NGOs), and private traders.

18. NAEC also initiated the comprehensive revision of the Government decree on agricultural extension to institutionalize participatory and pro-poor agricultural extension services. Decree No. 56 on agricultural and fishery extension, approved and issued by the Government in April 2005, (i) emphasizes the need for client-oriented services with an increased focus on economically disadvantaged areas, (ii) recognizes the role of grassroots agricultural extension service providers in communes and villages, and (iii) includes a provision for contractual arrangements for extension services. It is also expected to facilitate decentralization of extension service delivery and increase participation of farmers and other stakeholders, including mass organizations and nongovernment service providers, in planning and implementing extension activities. Decree No. 56 was formulated through a series of consultations with a wide range of stakeholders, including the relevant government agencies and a group of NGOs involved in agricultural extension. The NGOs highly commended the open and transparent process of consultations initiated by NAEC. In line with the new decree, the Project aims to promote pro-poor extension services and strengthen the technical capacity of grassroots extension service providers.

3. Rural-Based Technical and Vocational Training

19. The secondary technical and vocational schools of MARD in the agriculture sector provide an important opportunity to develop a competitive work force for agriculture and agro-based industries in Viet Nam. The agricultural training programs tend to be specified within the national qualifications frameworks that are closely related to tasks and skills required in the work force. The Education Law of 1998 provides an overall framework for reforming the education system in the country. Particular areas of focus include a general policy for decentralized decision-making related to the planning and implementation of rural-based training programs, and the improvement of teaching and learning quality. Significant renovation of curricula has occurred at the primary level, and ongoing improvements are being carried out at the secondary and higher levels with ADB assistance under ADB's ongoing loan for the Vocational and

Technical Education Project.⁷ These are expected to impact on the delivery of rural-based training through improved coordination within the national framework.

20. Viet Nam has about 300 secondary technical schools, of which one third is under the control of the national Government, and the rest belong to provincial and city management. In the agriculture sector, 31 of the 54 secondary technical schools are managed by MARD and the remaining schools belong to the provinces. In addition to secondary technical schools, the country has 226 vocational training schools, of which 102 are managed by the national Government and the rest by provinces and cities. These schools provide technicians and skilled workers with enrollments generally coming from lower secondary school graduates; the duration of training ranges from 1 to 3 years. In agricultural vocational training, MARD manages 17 schools, 10 are under provincial control. According to the assessment during project preparation, the quality of technical and vocational training schools varies in the agriculture sector. Some provincial institutions are funded and managed well with highly trained teachers, while others are poorly resourced and require substantial renovation.

21. Key issues evident among technical and vocational schools in the agriculture sector include (i) slow improvements in curriculum development to achieve effective competency-based training methods; (ii) lack of systematic flow of information on labor market demand in agriculture and agro-based industries, and weak school–industry linkages; (iii) inadequate teaching, learning, and library resources in AST; and (iv) lack of financial resources to maintain the quality of training programs. As agricultural training institutions are under the jurisdiction of various ministries, they lack a cohesive management structure and consistent curriculum development.

22. At present, the agricultural technical and vocational training schools do not have any formalized mechanisms to determine labor market demand for various technical skills related to agriculture and agro-based industries. Systematic labor market information gathering, being developed under ADB's ongoing Vocational and Technical Education Project, has the potential to contribute to determining labor market demand in the agriculture sector or can be a model for a similar system in the sector. The focus group meetings conducted during project formulation indicated increased efforts are required to strengthen school–industry partnerships to meet the demand from industries for school graduates.

23. Investment to date on the AST areas of technical and vocational agricultural training, and, in particular, the areas of postharvest and food processing have been minimal. The Project aims to contribute to filling gaps in these areas, and ensuring improved institutional capacity of the schools. The proposed improvement of school facilities and curricula under the Project is expected to address the critical needs of the schools to respond more effectively to industry demands. Efforts will be made to ensure progress toward the institutionalization of critical reforms that can be seen within the national technical and vocational education system.

4. Agricultural Market Information Services

24. The agricultural market information system (AMIS) is complex and heterogeneous. Various public AMIS operations are ongoing and overlapping in area, scope, and responsibility. At present, five AMIS activities are ongoing across 24 provinces. AMIS information usually flows

⁷ ADB. 1998. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Socialist Republic of Viet Nam for the Vocational and Technical Education Project*. Manila (Loan 1655–VIE). This loan supports only one school managed by MARD: Bac Giang Agricultural Secondary Technical School.

from farmers and traders in local markets to district and provincial offices in charge of information collection. At the provincial level, the information is collated, and some rudimentary analyses conducted. The summarized information is then transmitted by fax, telephone, or Internet to provinces and MARD for dissemination to the public through mass media. At the central level, the Information Technology and Statistics Center of MARD is responsible for AMIS activities and has six departments and units with 69 staff members. In addition, the Institute of Policy and Strategy for Agriculture and Rural Development of MARD handles part of AMIS information collection and analysis, particularly in the areas of market projection and trade analysis and promotion.

25. The effectiveness of the present AMIS operations is constrained due to (i) limited channels of information dissemination, (ii) inadequate budgetary allocations, (iii) poor local access to updated market information, (iv) shortage of trained personnel, and (v) weak linkages with extension services. To address these issues, the Government plans to strengthen the AMIS activities of the Information Technology and Statistics Center with the use of part of the counterpart funds generated under the ASDP program loan (about \$2.4 million), through the establishment of AMIS in 20 selected provinces. Other external funding agencies, including the World Bank and the governments of Australia and Canada, plan to support the improvement of AMIS operations in the country through the development of market information services that are more responsive to the needs of client farmers and traders, and strengthening of analytical capabilities of staff involved in AMIS activities. ADB considers these ongoing and proposed support activities to be adequate for addressing the existing needs of AMIS.

D. Need to Strengthen Agriculture Science and Technology

26. As Viet Nam's agriculture sector is increasingly liberalized in line with the country's economic policy and integrated into competitive international markets, the trend for diversification into higher value agricultural and agro-based production is expected to continue in the next decade. The policy focus needs to shift from increasing production volume to promoting higher product value and income. In this context, rapid improvement of the national AST system is required to address the needs of client farmers and enterprises for benefiting from (i) improved product quality, (ii) better skills to deal with complex supply chains and sophisticated markets, (iii) efficient processing and postharvest operations and innovative marketing skills, and (iv) improved collaboration between private and public sectors.

27. The importance of strengthening the national AST system through continued policy and institutional reforms and increased investment is fully recognized by the Government in its national development plans and strategy for the agriculture sector. In line with the country strategy and program for Viet Nam and in close coordination with other external funding agencies involved in the sector, ADB will continue to provide support for the Government to maintain its sustainable sector growth by addressing issues related to productivity, access to resources, agro-industry development, and science and technology.

EXTERNAL ASSISTANCE

Title	Duration	Source	Objectives	Amount (\$million)
Agriculture Sector Development Program	2002–2007	ADB	Support the Government's policy and institutional reforms to develop a favorable environment for market-based agricultural growth and agro-industry development.	90.0 (Loan)
Tea and Fruit Development Project	2000–2006	ADB	Increase farm income and raise the value of agricultural production through tea and fruit development.	40.2 (Loan)
Vocational and Technical Education Project	Ongoing from 1998	ADB	Help with the reform of vocational and technical education system in line with the Government's market-oriented industrialization policy.	54.0 (Loan)
Agriculture Sector Programme Support	Ongoing from 2000	Danida	Provide integrated assistance for agricultural and rural development through capacity-building activities at the Ministry of Agriculture and Rural Development. A second phase is being formulated.	46.5 (Grant)
Agriculture Diversification Project	1998–2005	World Bank	Help diversify and intensify agricultural production, thereby increasing farm income and rural employment through promotion of rubber smallholders and improved livestock production.	66.9 (Loan)
Northern Mountains Poverty Reduction Project	Ongoing from 2001	World Bank/ DFID	Promote community-based development activities through improvement of social and rural infrastructure.	132.5 (Loan/Grant)
Collaboration for Agriculture and Rural Development	Ongoing from 2004	AusAID	Increase productivity and competitiveness of smallholder agriculture and rural enterprises through support for agricultural research and development.	7.0 (Grant)
Strengthening of the National Institute of Veterinary Research	Ongoing from 1999	JICA	Support for the resolution of animal health issues and contribute to improved veterinary research.	1.9 (Grant)
Support to Public Administration Reform Program	Ongoing from 2001	UNDP/ Netherlands	Improve public administration in the Ministry of Agriculture and Rural Development through capacity strengthening in the use of information and communications technology.	3.9 (Grant)
Rural Income Diversification Project in Tuyen Quang Province	Ongoing from 2002	IFAD	Support villages with ethnic minority populations in upland areas to improve their access to rural infrastructure, health services, and finance.	20.9 (Loan)

ADB = Asian Development Bank; AusAID = Australian Agency for International Development; Danida = Danish International Development Assistance; DFID = Department for International Development; IFAD = International Fund for Agricultural Development; JICA = Japan International Cooperation Agency; UNDP = United Nations Development Programme.

Sources: Ministry of Agriculture and Rural Development, the Government of Vietnam; and Asian Development Bank.

LIST OF SELECTED AGRICULTURAL RESEARCH INSTITUTES

Institutes	Remarks
A. Crop Production and Biotechnology	
Cuu Long Rice Research Institute	Rice research institute established in 1977, and located in Cantho Province in the Mekong Delta region with about 300 staff and an annual budget of D5.5 billion (\$0.34 million). Its research laboratories for breeding and variety improvement of rice and other crops cultivated in the southern region require substantial upgrading.
Viet Nam Academy of Agricultural Science	The academy was established through a merger with the crop research institute, established in 1968 and located in Hai Duong Province in the Red River Delta region. It has about 280 staff and an annual budget of D4.7 billion (\$0.30 million) and requires upgrading of equipment for crop breeding, varieties evaluation, and seed production.
Institute of Agricultural Science of Southern Viet Nam	Main research institute in the southern region located in Ho Chi Minh City with about 430 staff in 10 research departments with an annual budget of D18.7 billion (\$1.17 million). It was established in 1925, and is engaged in both crop and livestock research programs. The Project will provide support for its laboratories for variety and seed testing, and for soil and plant protection in the acid-sulfate soils.
Southern Fruit Research Institute	New institute established in 1994, and located in Tien Giang Province near Ho Chi Minh City, with about 130 staff and an annual budget of D4.4 billion (\$0.27 million). Its research programs focus on the selection and breeding of main fruit crops; fruit processing, storage and packaging; and fruit crop diseases. Procurement of cold storage and biotechnology equipment is required.
B. Livestock and Biotechnology	
Institute of Agricultural Science of Southern Viet Nam—Binh Thang Training and Research Center	Binh Thang Training and Research Center of the Institute of Agricultural Science is engaged in livestock research, including equipment and facilities for meat quality assessment, pig breeding, and environment control in livestock production. Equipment for microorganism incubation, meat storage, and soil analysis need upgrading.
C. Postharvest Handling, Agriculture Engineering, and Product Quality	
Viet Nam Academy of Agricultural Science (formerly National Institute of Plant Protection)	The institute for plant protection research, mainly industrial crops, was established in 1968, and located in Hanoi with about 150 staff and an annual budget of D4.0 billion (\$0.25 million). It is also engaged in tea cultivation and processing. Its laboratory facilities for analyzing pesticide residues and for preserving pests and disease samples need upgrading of equipment.

Institutes	Remarks
Western Highland Agroforestry Science and Technology Institute	The institute was established in 1983, and engages in research programs on forestry and agroforestry, agro-industries, and postharvest operations. It is located in Daklak Province in the central highlands region, and has about 250 staff and an annual budget of D2.2 billion (\$0.14 million). Laboratory equipment and facilities for analysis of agricultural and forestry products and feeds, and plant protection in the central highlands region need to be improved.
D. Natural Resources—Land, Forest, and Water Management	
Viet Nam Academy of Agricultural Science (formerly National Institute of Soils and Fertilizers)	The institute for research on soils and agrochemicals was established in 1969. It has about 170 staff and an annual budget of D3.6 billion (\$0.22 million). Its laboratory equipment for soil, plant, and fertilizer analysis needs upgrading.
Forest Science Institute of Viet Nam	The primary institute for forestry research was established in 1961, and located in Hanoi with about 480 staff in 10 research units and six laboratories, including facilities for forestland studies (soil, plant, and water analysis), and forest soil fertility management. Its annual budget is about D13.3 billion (\$0.83 million). Laboratory equipment for plant photosynthesis and soil analyses needs to be improved.
E. Economics, Strategies, and Market	
Institute for Agriculture Economics	The institute for agricultural policy planning was established in 1977, and located in Hanoi with about 60 staff in 4 research divisions with an annual budget of D1.1 billion (\$0.07 million). It carries out research programs on agriculture strategies, policies, and market issues. Computers and other basic equipment for geographic information systems need upgrading.

Sources: Ministry of Agriculture and Rural Development, Government of Vietnam; and Asian Development Bank. 2003. *Technical Assistance to the Socialist Republic of Viet Nam for Preparing the Agriculture Science and Technology Project* (Financed by the Japan Special Fund). Manila (TA 4194–VIE).

LIST OF SELECTED TECHNICAL AND VOCATIONAL TRAINING SCHOOLS

Training Schools	Remarks
Food College (Da Nang)	The Food College, located in Da Nang Province in the south central coast region, has a large student enrolment with about 2,300 full-time secondary students studying postharvest processing, and 400 college students. The equipment and facilities of its practice food processing plants and library are obsolete, and need to be improved to meet the demand of local agro-based industries.
Secondary Technical and Vocational School (Lam Dong)	The school, located in Lam Dong Province in the central highlands region, has about 34% of its 1,200 students enrolled in the subject areas of agricultural cultivation, animal husbandry, veterinary studies, and land management. It is an important institution for rural-based technical and vocational training in the central highlands, where poverty incidence and ethnic minority population are high. As the school was established in the 1960s, most of the library, laboratory, and classroom facilities are run down and require upgrading.
Secondary Technical, Vocational, and Agriculture and Rural Development School (Ha Tay)	This school is located in Ha Tay Province in the Red River Delta region in the north of Viet Nam, and focuses on rural worker training programs in agriculture and livestock, horticulture, and land management. About 60% of the 1,500 students are enrolled in these programs with the majority of students coming from the upland and remote areas with a high proportion of students from ethnic minorities. Seven of the 11 laboratories, library facilities, and about half of the 26 classrooms require renovation.
Agricultural and Rural Development Secondary Technical School (Tien Giang)	This rural-based training school has a high percentage of enrolments (about 70%) in agriculture, animal husbandry, plant protection, and irrigation management. The school is located in Tien Giang Province in the Mekong River Delta region, where only 4% of rural workers have received any formal training. Local demand for graduates of technical and vocational training schools is increasing because of the increasing number of agro-based and food processing industries in the province (20 companies), and nearby provinces of Can Tho (100 companies), Soc Trang (75 companies), and Ca Mau (60 companies). These companies range from small-scale to large enterprises employing between 10 and 100 workers in each processing plant. The school plans to respond more to this local industry demand for training in agro-based postharvest processing. The teaching staff is relatively young with about 40% under 35 years. The school requires adequate laboratory equipment and facilities for the delivery of postharvest training programs.
Secondary School for Mechanics, Agricultural Technique and Rural Development (Can Tho)	Located in Can Tho Province in the Mekong River Delta region, this vocational school has about 58% of students enrolled in agriculture, covering animal husbandry and veterinary studies, crop and plant protection, and sugarcane production and processing. The school is near an export processing zone, where a large number of agro-based enterprises are engaged in processing pineapples, aquaculture products, and mushrooms. However, the school needs adequate laboratory equipment and facilities dedicated to agriculture and the practice of postharvest processing operations. The school

Training Schools	Remarks
	has a relatively young teaching staff with 52% under 35 years.
Secondary Technical School for Food and Foodstuff Management (Hai Phong)	This technical school is located in Hai Phong Province in the Red River Delta region. About 52% of the students are enrolled in food processing and preservation, and salt processing. MARD recognizes the need to increase the teaching capacity of the school in offering postharvest training through staff development and improvements in library and laboratory equipment and facilities. Though a large proportion of managerial staff are senior staff, the teaching staff of the school are relatively young with about 39% under 35 years.
Secondary Technical School for Food Processing (Ho Chi Minh City)	This school is located in Ho Chi Minh City in the southeastern region of Viet Nam. About 56% of the students are enrolled in agro-based postharvest processing, significantly contributing to technical and vocational training in the subject. Its training programs include food technology, microbiology, and quality control of food products. The school needs to upgrade laboratory and library equipment and facilities, and renovate some classrooms.
Agricultural Materials and Food Secondary Technical School (Hanoi)	This secondary technical school has about 55% of students enrolled in postharvest processing, mostly at the upper secondary education level. The school requires upgrading of laboratory equipment and facilities for practice product processing activities, as the quality of teaching programs are severely limited by old and obsolete machines and library facilities. The school also indicated its strong need for capacity strengthening of teaching and administrative staff.
Water Resources Secondary Technical and Vocational School No. 1 (Ha Nam Province)	Located in Ha Nam Province in the Red River Delta region, this vocational school is mainly engaged in agricultural training, irrigation management, and related mechanical works. About 90% of the total enrolments of 1,482 students are at the upper secondary level. The school needs urgent upgrading of materials and facilities for its library and laboratory facilities, and capacity strengthening of teaching and administrative staff in labor market information systems and program curriculum development skills.
Water Resources Secondary Technical and Vocational School No. 2 (Quang Nam Province)	This vocational school is located in Quang Nam Province in the south central coast region with about 6,000 students, mostly at the upper secondary level. The school's technical and vocational programs focus on irrigation management and technology, rural water supply and drainage, and land management. The school requires support for upgrading materials and facilities for its library and laboratory facilities, and capacity strengthening of teaching and administrative staff in labor market information systems and program and curriculum development skills.

Sources: Ministry of Agriculture and Rural Development, Government of Vietnam; and Asian Development Bank. 2003. *Technical Assistance to the Socialist Republic of Viet Nam for Preparing the Agriculture Science and Technology Project* (Financed by the Japan Special Fund). Manila (TA 4194-VIE).

DETAILED COST ESTIMATES

Table A6.1: Detailed Cost Estimates by Expenditure and by Project Component
(\$'000)

Item	Client- Oriented Agricultural Research and Capacity Strengthening	Grassroot Agricultural Extension Improvement	Rural- based Technical and Vocational Training	Project Management Support	Total
A. Investment Costs					
Civil Works	53	0	1,549	0	1,602
Equipment	3,380	221	6,338	151	10,090
Vehicles	0	0	0	72	72
Materials	1,811	142	843	33	2,829
Training	4,994	2,814	315	0	8,123
Research and Extension Contracts	5,500	4,582	0	0	10,082
Consulting Services	0	0	0	982	982
Subtotal (A)	15,738	7,759	9,045	1,238	33,780
B. Recurrent Costs					
Incremental Staff	0	17	0	1,140	1,157
Operating Costs	0	19	0	865	884
Subtotal (B)	0	36	0	2,005	2,041
Total Base Cost	15,738	7,795	9,045	3,243	35,821
C. Contingencies					
Physical Contingencies	785	757	271	204	2,017
Price Contingencies	345	400	529	272	1,546
Subtotal (C)	1,130	1,157	800	476	3,563
D. Financing Charge during Implementation	0	0	0	616	616
Total Project Costs	16,868	8,952	9,845	4,335	40,000

Source: Asian Development Bank (ADB). 2003. *Technical Assistance to the Socialist Republic of Viet Nam for Preparing the Agriculture Science and Technology Project* (Financed by the Japan Special Fund). Manila (TA 4194–VIE); and ADB estimates.

Table A6.2: Detailed Cost Estimates by Financier



Item	ADB		The Government		Total	
	Amount (\$'000)	FR (%)	Amount (\$'000)	FR (%)	Amount (\$'000)	PR (%)
A. Investment Costs						
Civil Works	1,201	75	401	25	1,602	4
Equipment	7,609	75	2,481	25	10,090	25
Vehicles	36	50	36	50	72	0
Materials	2,122	75	707	25	2,829	7
Training	6,352	78	1,771	22	8,123	20
Research and Extension Contracts	7,894	78	2,188	22	10,082	26
Consulting Services	982	100	0	0	982	2
Subtotal (A)	26,196		7,584		33,780	
B. Recurrent Costs						
Incremental Staff Salaries	0	0	1,157	100	1,157	3
Other Operating Costs	663	75	221	25	884	2
Subtotal (B)	663		1,378		2,041	
Total Base Cost	26,859		8,962		35,821	
C. Contingencies	2,525		1,038		3,563	9
D. Financing Charge during Implementation	616	100	0	0	616	2
Total Project Costs	30,000	75	10,000	25	40,000	100

ADB = Asian Development Bank, FR = financing ratio, PR = proportion of category to the total disbursements.

Source: ADB. 2003. *Technical Assistance to the Socialist Republic of Viet Nam for Preparing the Agriculture Science and Technology Project* (Financed by the Japan Special Fund). Manila (TA 4194–VIE); and ADB estimates.

PROJECT IMPLEMENTATION SCHEDULE

Item	2007				2008				2009				2010				2011			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
A. Client-oriented Agricultural Research and Capacity Strengthening																				
Client-oriented agricultural research programs																				
- Identification of research needs																				
- Procurement of needed materials and equipment																				
- Use of research funds for selected programs																				
Training and post-graduate programs																				
- Preparation of programs																				
- Application and selection																				
- Program implementation																				
Upgrading of equipment																				
- Equipment specification and tendering																				
- Procurement and installation																				
- Training for equipment use and maintenance																				
B. Grassroots Agricultural Extension Improvement																				
Provincial plans for pro-poor agricultural extension services																				
Training programs for trainers, extension staff, and grassroots service providers																				
- Extension module development																				
- Preparation of programs																				
- Application and selection																				
- Program implementation																				
Provision of on-farm demonstration trials																				
Contractual agricultural extension services																				
- Establishment of a contractual management system																				
- Extension contracts																				
Capacity strengthening of local extension centers																				
- Equipment specification and tendering																				
- Procurement and installation																				
C. Rural-based Technical and Vocational Training																				
Training programs for teaching and administrative staff																				
- Preparation of programs																				
- Application and selection																				
- Program implementation																				
- Support for developing curriculum guides																				
Upgrading of library and laboratory facilities																				
- Equipment specification and tendering																				
- Procurement and installation																				
- Training for equipment use and maintenance																				
D. Project Management Support																				
Establishment of provincial project management units																				
Recruitment of implementation consultants																				
Procurement of vehicles and equipment																				
Appointment of incremental project staff																				
Establishment of a project steering committee																				
Monitoring of project activities																				
Financial auditing																				
Quarterly progress reporting																				
Midterm review																				
Project completion review																				

 Timing of project activities.
 Intermittent or continuous activities.

Source: ADB. 2003. *Technical Assistance to the Socialist Republic of Viet Nam for Preparing the Agriculture Science and Technology Project* (Financed by the Japan Special Fund). Manila (TA 4194-VIE); and ADB estimates.

PROCUREMENT PLAN

Project Information

Country	Viet Nam
Name of Borrower	Socialist Republic of Viet Nam
Project Name	Agriculture Science and Technology Project
Loan or TA Reference	To be determined (tbd)
Date of Effectiveness	tbd
Amount \$ (total from all financiers):	\$40 million
Of which Committed, \$	\$30 million
Executing Agency	Ministry of Agriculture and Rural Development
Approval Date of Original Procurement Plan	tbd
Approval of Most Recent Procurement Plan	tbd
Publication for Local Advertisement ^a	tbd
Period Covered by this Plan	2006 – 2011

Procurement Thresholds, Goods & Related Services, Works and Supply & Install

Procurement Methods	To be used above/below (\$)
ICB works	At least \$1,000,000
ICB goods	At least \$500,000
NCB works	Less than \$1,000,000 but more than \$100,000
NCB goods	Less than \$500,000 but more than \$100,000
Shopping Works	Less than \$100,000
Shopping Goods	Less than \$100,000

Procurement Thresholds, Consultants Services

Procurement Methods	To be used above/below (\$)
Quality- and Cost-Based Selection (QCBS)	At least \$200,000
Consultants Qualifications Selection (CQS)	Less than \$200,000
Least Cost Selection (LCS)	Less than \$100,000

List of Major Contract Packages, Goods, Works and Consulting Services

Ref	Contract Description	Estimated Costs (\$)	Procurement Methods	Expected Date of First Advertisement	Prior Review Y/N	Comments
Client-Oriented Agricultural Research and Capacity Strengthening						
1	Equipment and Materials ^b	6,955,000 (100 packages)	NCB/SP	4th Quarter 07	Y	Financed by ADB
2	Research Contracts	5,500,000 (80 packages)	NCB	1st Quarter 08	Y	Financed by ADB
3	Training – University ^c	3,555,000 (90 packages)	DC	4th Quarter 07	Y	Financed by ADB
4	Training – Non-university ^c	440,000 (20 packages)	DC	1st Quarter 09	Y	Financed by ADB

Grassroots Agricultural Extension Improvement						
5	Equipment and Materials	349,000 (15 packages)	NCB/SP	3rd Quarter 07	Y	Financed by ADB
6	Extension Service Contracts	4,175,000 (1,338 packages)	NCB	2nd Quarter 08	Y	Financed by ADB
Rural-Based Technical and Vocational Training						
7	Civil Works ^d	1,333,000 (10 packages)	NCB	1st Quarter 08	Y	Financed by ADB
8	Equipment and Materials ^e	6,289,000 (31 packages)	NCB	4th Quarter 07	Y	Financed by ADB
Project Management Support						
9	Equipment, Materials and Vehicle	178,000 (6 packages)	NCB/SP	3rd Quarter 07	Y	Financed by ADB
10	Consulting Services	982,000	QCBS	2nd Quarter 07	Y	Financed by ADB

DC = direct contracting; NCB = national competitive bidding; QCBS = quality- and cost-based selection; SP = shopping.

^a General procurement notice, invitations to pre-qualify and to bid, calls for expressions of interest.

^b The total of over 500 line items, often with multiple units and types of specialized equipment, are assumed to be combined into about 100 packages at an average value about \$70,000.

^c Training activities include overseas postgraduate study and post-doctoral programs.

^d Assumes one contract per school, some over 3 years.

^e Assumes one initial contract for office equipment, and then three contracts per school for laboratory equipment, processing machinery, and library materials.

Source: ADB. 2003. *Technical Assistance to the Socialist Republic of Viet Nam for Preparing the Agriculture Science and Technology Project* (Financed by the Japan Special Fund). Manila (TA 4194–VIE); and ADB estimates.

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

1. The Project requires a team of consultants (Table A9). The consultants will carry out their tasks under the general supervision of the central project management unit (CPMU) of the Ministry of Agriculture and Rural Development (MARD). The team leader will be the international agricultural research management specialist.

Table A9: Breakdown of Consultant Inputs
(person-months)

Consultant	International	National	Total
Agricultural Research Management	16	34	50
Agricultural Extension Management	5	22	27
Agricultural Vocational Training	1	11	12
Social Development	2	6	8
Environmental Assessment	2	11	13
Financial Management	1	8	9
Monitoring and Evaluation	2	4	6
Total	29	96	125

Sources: Asian Development Bank. 2003. *Technical Assistance to the Socialist Republic of Viet Nam for Preparing the Agriculture Science and Technology Project* (Financed by the Japan Special Fund). Manila. (TA 4194-VIE); Ministry of Agriculture and Rural Development, the Government of Viet Nam.

A. Agricultural Research Management and Team Leadership

2. The agricultural research management specialists should have an advanced degree in the fields related to agriculture science and technology (AST) with extensive experience in the management and organization of competitive research funding systems, and preferably familiarity with agricultural research in Viet Nam. The specialists will undertake the following:

- (i) Provide necessary technical and management support to MARD for effective project implementation.
- (ii) Develop a detailed work plan for project implementation in consultation with the relevant departments of MARD, including the Department of Science and Technology, National Agricultural Extension Center, Department of Organization and Personnel, Department of Agriculture, and other key stakeholders.
- (iii) Help develop, establish, and institutionalize a mechanism for competitive research funding by leading the consultant team in view of the lessons learned and experiences in Viet Nam and other countries in East and Southeast Asia.
- (iv) Assist in ensuring coordination among the relevant central, provincial, and district agencies; regional research institutes; and other stakeholders for the implementation of the competitive research funding system under the Project.
- (v) Assist in establishing an appropriate project management and monitoring system.
- (vi) Carry out a training needs assessment for researchers during the first year of the Project, and formulate detailed in-country on-the-job training and overseas study programs in consultation with the Department of Science and Technology and Department of Organization and Personnel, and based on MARD's approved human resource development plan for agricultural research.
- (vii) Help establish a detailed mechanism for the selection of trainees and candidates.

- (viii) Examine the priority needs for upgrading equipment and facilities based on the list prepared during project formulation, and help prepare detailed technical specifications through consultation with the relevant institutes and the Department of Science and Technology of MARD.
- (ix) Provide or arrange for necessary training on the knowledge and skills for the use of existing sophisticated equipment installed at research institutes.
- (x) Assist in the procurement of equipment, materials, and civil works required for the Project, in accordance with the *Procurement Guidelines* of the Asian Development Bank (ADB).
- (xi) Lead the preparation of consultants' technical working papers and progress reports, and assist the CPMU in preparing quarterly progress reports on the Project to be submitted to the project steering committee and ADB.

B. Agricultural Extension Management

3. The agricultural extension management specialists should have adequate work experience, preferably in Viet Nam, and expertise in the development and implementation of pro-poor and client-oriented extension delivery systems, including those of a contestable extension delivery system. In close consultation with the National Agricultural Extension Center of MARD, the specialists will undertake the following:

- (i) Assist the CPMU and provincial project management units (PPMUs) of the project provinces in establishing appropriate project management systems and mechanisms for local stakeholder participation.
- (ii) Assist the CPMU and PPMUs in implementing the central and provincial contestable extension funding mechanisms.
- (iii) Develop systems and procedures for financial management and auditing of extension funds, including the potential for nongovernment contributions to the costs of extension delivery.
- (iv) Facilitate the development of central and provincial extension program priorities, including those with a commodity, thematic, and targeted community focus, and the development of provincial extension investment portfolios.
- (v) Help improve the management, monitoring and evaluation, and reporting skills of the PPMUs and other relevant provincial agencies.
- (vi) Prepare and test the extension program guidelines, which incorporate (a) eligibility and selection criteria for extension contracts and service providers; (b) development of appropriate terms of reference for contracts and job description for service providers; (c) monitoring and evaluation; and (d) financial management, accounting, auditing, and reporting systems.
- (vii) Develop extension service provider training modules for low-cost and participatory extension methodology, and farmer group business development and management.
- (viii) Organize and facilitate training of trainers workshops for provincial extension service provider trainers from target provinces.
- (ix) Assist in establishing an appropriate system for conducting demonstration trials on a contractual basis in the project provinces.
- (x) Help with the procurement of equipment and materials related to the project activities for agricultural extension and on-farm demonstration trials.

C. Agricultural Vocational Training

3. The agricultural vocational training specialists should have adequate work experience, preferably in Viet Nam, and relevant expertise in vocational and technical training in the agriculture sector and in curriculum planning and development. In close consultation with MARD, the responsibilities of the specialists will include the following:

- (i) Ensure effective coordination among MARD; Ministry of Labor, Invalids, and Social Affairs; and other relevant agencies, including the Ministry of Education and Training, with respect to implementation of the project component for rural-based technical and vocational training.
- (ii) Assist MARD in formulating the work plans for staff development and strengthening of institutional capacity of the selected technical and vocational schools covered under the Project.
- (iii) Assist MARD and the technical and vocational schools selected for the Project in effectively adopting the national curriculum guide and the program accreditation system in close consultation with the General Department of the Ministry of Labor, Invalids, and Social Affairs.
- (iv) Help formulate, in collaboration with the agricultural extension management specialists and in consultation with the Ministry of Education and Training, detailed curricula for the 10 selected technical and vocational training schools of MARD to provide a basis for identifying and specifying classroom and laboratory equipment and facilities.
- (v) Help strengthen the linkage of MARD and the agricultural technical and vocational schools with the relevant industry representatives in relation to the labor market in the agriculture sector.
- (vi) Provide other necessary technical and advisory support for the CPMU and PPMUs in the area of technical and vocational training in the agriculture sector.

D. Social Development

4. The social development specialists should have an advanced degree in the relevant social sciences, and adequate experience in social development activities preferably in Viet Nam. The specialists will undertake the following:

- (i) Formulate detailed work plans for the social development aspects of the Project based on the gender and indigenous people's action plans prepared during project formulation with any revisions, if necessary.
- (ii) Provide technical support and guidance for the CPMU and PPMUs on implementation of the gender and indigenous people's action plans, and help develop an appropriate mechanism to ensure that the social development aspects are fully addressed.
- (iii) Ensure that socially adverse impacts of the Project are avoided and properly addressed during implementation.
- (iv) Help provide capacity strengthening support for project staff and other key stakeholders through participatory workshops and training courses in consultation with the CPMU and PPMUs.
- (v) Ensure a mechanism for appropriate social monitoring activities for the Project.

E. Environmental Assessment

5. The environmental assessment specialists should have an advanced degree in environmental sciences or agriculture; and adequate experience working in environmental

assessment under projects of external funding agencies. Tasks of the specialists will include the following:

- (i) Conduct a detailed review of the project environmental monitoring plan (EMP), developed during project formulation, and prepare an appropriate work plan and schedule to implement the EMP in consultation with the CPMU and PPMUs.
- (ii) Provide technical support and guidance for the CPMU and PPMUs on EMP implementation, and help develop an appropriate mechanism in project management to ensure that appropriate environmental assessments are carried out and environmental aspects are fully addressed.
- (iii) Help formulate necessary environmental assessment reports in accordance with the guidelines of the Government and ADB in carrying out civil works included in the Project.
- (iv) Assist the CPMU and PPMUs in ensuring the procurement works are done in line with the environmentally responsible guidelines included in ADB's *Environmental Assessment Guidelines* (2003).
- (v) Assist the CPMU and PPMUs in developing an appropriate environmental monitoring system and institutionalizing the system in project management.

F. Financial Management

6. The financial management specialists should have a degree in finance and other relevant fields; and adequate practical experience in projects funded by external funding agencies in developing countries, preferably in Viet Nam. The specialists will undertake the following:

- (i) Conduct a detailed review of the existing procedures of MARD for accounting and financial reporting at the central level and in the five project provinces within 1 month of project inception, and make specific recommendations on the means to resolve potential issues in financial management.
- (ii) Assess the staff capability, particularly at the PPMUs, the participating research institutes, and technical and vocational training schools, as required, and identify needs for training on financial management.
- (iii) Assist the CPMU, PPMUs, the participating research institutes, and technical and vocational training schools, as required, in establishing an appropriate uniform financial system for accounting, monitoring, and reporting acceptable to ADB and the Government.
- (iv) Provide the CPMU and PPMUs with necessary advice and training in accordance with the relevant financial regulations of the Government, and ADB's *Loan Disbursement Handbook* and statement of expenditure procedures.
- (v) Assist the CPMU and PPMUs in identifying implementation issues related to financial management, and resolving them in close consultation with the Ministry of Finance, State Bank of Viet Nam, provincial treasuries, and ADB.

G. Monitoring and Evaluation

7. The monitoring and evaluation specialists should have an advanced degree in relevant fields; and adequate experience in project monitoring and evaluation in developing countries, preferably in Viet Nam. The specialists will have the following responsibilities:

- (i) Develop an appropriate methodology to assess financial impact of extension programs.
- (ii) Develop appropriate methodologies for evaluating the economic, social, and environmental impact of the Project.

- (iii) Prepare a monitoring and evaluation training manual, and train provincial and district staff in target provinces in the conduct and reporting of project monitoring and evaluation with close reference to the Government regulations on monitoring and evaluation of externally financed projects.
- (iv) Prepare an annual implementation timetable for monitoring and evaluation, including data collection and analysis.
- (v) Provide advice to the CPMU and PPMUs on the consolidation of project monitoring and evaluation, and the development of procedures to monitor, and evaluate provincial and national impact.
- (vi) Assist the CPMU to develop performance indicators and measures for the development of institutional capacities to plan and manage contestable extension delivery systems to ensure effective project activities in terms of its impact.
- (vii) Manage the ongoing project monitoring and impact evaluation process.
- (viii) Provide project and program reports to the National Agricultural Extension Center and provincial administrations on the national and provincial impact of the extension program.

ECONOMIC ANALYSIS

A. Project Economic Rationale

1. Since the introduction of market-oriented policy and institutional reforms, Viet Nam's agricultural growth has largely depended on increased land, labor and fertilizer inputs, and higher investment in irrigation development and rehabilitation. This factor accumulation was largely a result of state expenditures in agriculture inputs and infrastructure. However, the scope for continued growth based on such investment is limited in the medium to long term. The Government fully recognizes the need for a shift in the sector strategy to increased production value and diversification into higher-value products and innovative marketing. The Project aims to support this new sector strategy by strengthening the national agriculture science and technology (AST) system, and by supporting effective pro-poor delivery of improved AST. Other factors that strengthen the case for the provision of AST by the public sector include (i) the role of the public sector to adapt research results to local needs, and extend research findings to a large number of smallholder and poor farmers through the nationwide public extension network; (ii) poverty-reduction dimensions that need to be included in any AST efforts in Viet Nam, particularly in upland and remote areas; and (iii) strategic importance of AST for sustainable and equitable growth of the agriculture sector.

2. Accurately estimating the economic impact of a specific investment in AST activities is difficult due to the existence of various external benefits and costs, spillover effects, and long time lags. However, rigorous efforts have been undertaken to evaluate overall economic benefits generated from investment in the AST activities. A special evaluation study conducted by the Asian Development Bank (ADB) summarizes past studies and the results of its assessment of case studies selected from the past ADB projects.¹ This special study highlights high returns to investment in AST activities, including agricultural research and extension, with internal rates of return ranging from 20–60% with a few exceeding 100%. The estimated median value was about 37%. The study indicates that the more disaggregated the analysis, the higher the variation expected in the rates of return. Similar studies conducted by the International Food Policy Research Institute and the United States Department of Agriculture estimate high economic benefits from investments in AST activities with average rates of return of 30–50%. The economic justification for the Project based on the assessment of national economic benefits directly attributed to the project activities is difficult due to the nature of AST activities. However, highly positive economic benefits are expected from the proposed activities to strengthen the national AST system.

3. In view of the nature of benefits generated from AST activities, the distributional aspects of the Project also need to be considered qualitatively. The lack of access to improved AST is only one aspect of multidimensional rural poverty. Access to improved technology alone cannot overcome poverty as the role of technology in poverty reduction is both indirect and partial. Legitimate concerns focus on the fact that rich farmers have more resources to apply new technologies and that technology-led change in agriculture has favored better-off farmers in the past. Stakeholder consultations for project formulation identified the need for special measures and efforts to incorporate poverty focus and engineer pro-poor AST mechanisms into the project design. The five project provinces selected for the agricultural extension activities have high incidence of poverty and high proportions of ethnic minority population in upland and remote districts (Appendix 11). However, the poverty focus is more than simply selecting areas with a

¹ ADB. 2000. *Special Evaluation Study on the Policy Implementation and Impact of Agriculture and Natural Resources Research*. Manila (SST: STU 2000-17).

high incidence of poverty. Simply choosing poor provinces and districts does not provide effective poverty focus as no area is wholly poor and the relatively better-off farmers will always be better able to secure benefits often at the expense of poor farmers.

4. ADB's dialogue with key stakeholders during project formulation and in relation to the ongoing Agriculture Sector Development Program (ASDP)² indicate that pro-poor agricultural growth will require provision of mechanisms for the AST demand of poor farmers to become effective and for the national AST system to be restructured to be responsive to farmers' demands rather than a simple, top-down distribution of knowledge. The project components for client-oriented agricultural research and for grassroots agricultural extension improvement have incorporated these factors into the design through improved linkages between research and extension and through the process of stakeholder participation. These measures aim to ensure that the local needs and pro-poor aspects are reflected in the detailed planning and implementation of project activities. In addition, provision of a new framework for pro-poor extension services under the ongoing ASDP and provision of technical and advisory support for continued reforms and increased project readiness³ are expected to enhance the positive impact of the Project on poverty reduction.

B. Project Alternatives

5. In line with the AST road map⁴ prepared in conjunction with the ongoing ASDP, the Project stresses the importance of increased investment in upgrading physical and human resources to strengthen the country's AST system. The capacity and quality of the national AST system and institutions are expected to continue to deteriorate in the absence of the proposed Project. ADB has emphasized during dialogue with the Government that the increased investment needs to be undertaken within the framework of the ongoing reform measures being implemented under the ASDP and build on the ASDP's major achievements in policy and institutional strengths related to agricultural research, extension, training, and market information systems.

6. ADB's country strategy and program (CSP) for Viet Nam (2002–2004) and its subsequent updates highlighted the need for improved AST in facilitating the country's sustainable growth and geographically focused support for the central region. Under this framework, the Project's approach for capacity strengthening of existing institutions and human resources has been developed and is considered the most cost-effective option in comparison with other alternatives. This approach is also in line with ADB's new CSP (2007–2010) approved in October 2006, which aims at pro-poor economic growth.

7. Under the proposed approach, selection of alternative methods has been made through a series of participatory consultations, where stakeholders (i) determined priorities for investments in research institutes in view of the existing stock of equipment and facilities, capacity of research staff, and proposed investment plans with the Government's own resources; and (ii) included the technical and vocational training schools of the Ministry of Agriculture and Rural Development (MARD) with substantial student enrolments in target subject areas on agro-based technical training and postharvest operations. This process was adopted to identify the specific needs to help the country's agriculture sector move in rapid

² ADB. 2002. *Report and Recommendation of the President to the Board of Directors on Proposed Loans to the Socialist Republic of Viet Nam for the Agriculture Sector Development Program*. Manila (Loans 1972/1973–VIE).

³ ADB. 2005. *Technical Assistance to the Socialist Republic of Viet Nam for Strengthening Agriculture Science and Technology Management*. Manila (TA 4619–VIE).

⁴ ADB. 2003. *Strategy and Road Map for Agriculture Science and Technology in Viet Nam*. Manila.

transition from subsistence production to a sector with diversified, higher-value products oriented to competitive markets.

C. Economic Benefits

8. The Project will generate two distinct economic benefits to the agriculture sector through (i) more client-oriented agricultural research and extension services, and (ii) improved capacity of rural-based technical and vocational training schools to upgrade the quality of their graduates to meet the labor demand of agriculture and agro-based industries. Direct beneficiaries will be farmers and the selected institutions involved in the AST activities, including agricultural research institutes, extension centers, and rural-based technical and vocational training schools.

1. More Client-Oriented Agricultural Research and Extension Services

9. The Project will not create any entirely new facilities from which clear streams of future benefits can be derived. The Project will provide incremental and replacement equipment that will complement existing equipment and facilities previously financed by the Government and external funding agencies. This equipment and facilities will be used in combination by researchers and other users. Attempts to disaggregate the benefit and cost streams to individual financing sources would be arbitrary. The use to which the resources will be put and the benefits derived cannot be predicted due to the participatory, demand-driven nature of the research and extension activities proposed under the Project. In addition, the Project will not support specific research and extension programs but aims to strengthen the overall capacity of research and extension services to meet the needs of farmers, traders, and enterprises. Thus, taking a comparative, empirically grounded approach to estimate economic benefits of the components for client-oriented agricultural research and grassroots extension improvement is reasonable.

10. Studies on the investment in general improvement of the AST system estimate the rates of return in the range of 30–50% (para. 2). These figures can indicate some magnitude of the rates of return expected from the project components related to agricultural research and extension. The rates of return claimed for sample projects cannot be an accurate guide to estimate the returns expected from the broad-based AST support proposed under the Project. These rates of return also vary widely. However, for the purpose of comparison, the postevaluation of some research programs actually conducted in Viet Nam with funds from external funding agencies indicate a range of economic internal rates of return at 26–47%. More details of these comparative and empirical studies are included in Supplementary Appendix D.

2. Improved Capacity of Technical and Vocational Training Schools

11. The Project aims to improve the quality of graduates from 10 selected rural-based technical and vocational schools of MARD, which have substantial student enrolments in the courses on agro-based technical training, postharvest operations, and agribusiness. Project support will be provided to strengthen these subject areas of the 10 schools.

12. The Project will strengthen the linkages among the technical and vocational training schools, colleges, and the agricultural and agro-based industries in the respective regions, particularly private sector employers. In partnership with industries, 15 new curricula will be developed to provide modern and market-oriented courses and enable the schools to provide courses for an increased number of students. To ensure that the new curricula can be effectively taught, the Project will (i) provide necessary training for teachers and administrative

staff; (ii) renovate or construct their classrooms, libraries, and laboratories; and (iii) provide equipment and materials.

13. Upgrading 10 rural-based technical and vocational training schools, introducing new and relevant curricula, and improving teaching and learning resources will contribute to providing better qualified graduates, who will be readily employable in the agricultural and agribusiness enterprises. With the present enrolment of about 11,600 students in agricultural and postharvest disciplines, about 5,800 better qualified graduates are estimated to enter into the skilled job market each year. The increase in classroom capacity will allow student enrolments to increase by 10%, adding a further 580 graduates per year.

14. Following the methodology adopted for ADB's ongoing Vocational and Technical Education Project,⁵ the flows of incremental incomes of the existing student enrolment level (5,800 graduates per year) and of the increased enrolment facilitated by the Project (580 graduates per year) may be quantified. Accordingly, the flows of incremental incomes can be assumed to reflect the increased contribution of the graduates, and thus of the Project, to the overall economy. In practice, this is rather arbitrary and conservative as the graduates will be unable to secure the entire productivity increase attributed to the Project. Based on the past data and information, and assumptions of (i) working life of graduates of 20 years, (ii) course length of 2 years, (iii) incremental annual earning of a graduate with improved capacity at \$250 and that of an extra graduate at \$500, (iv) a drop-out rate of 20% and employment rate of the graduates at 90%, and (v) the domestic price numeraire with a shadow exchange rate factor of 1.11, the economic internal rate of return is estimated at about 31%.

15. Major assumptions of the base case scenario have been subjected to the sensitivity analysis to identify the range and nature of critical risks. Based on the results of the sensitivity analysis, the project component for rural-based technical and vocational training is not considered to be sensitive to adverse changes in major sources of benefits or costs, and the component is highly viable. More details are included in Supplementary Appendix D.

D. Financial and Institutional Sustainability

16. The Project will not establish any new public institutions, and staff numbers and other incremental operating costs will not increase significantly. As some new equipment is likely to require additional consumable supplies, the Project includes a provision for initial stocks of such supplies equivalent to 10% of the equipment value. These stocks are expected to sustain operations during the project period and initial post-project use. This will allow demonstration of the utility of the new facilities to support increased budget provision or funding through cost recovery research contracts.

17. A field survey was conducted during project formulation to examine the willingness to pay for improved scientific knowledge and technology among farmer beneficiaries. About 85% indicated they were willing to pay for improved AST. This indicates potential for cost recovery and fee-based nongovernment services with acceptable quality. A variety of sources provide improved AST and related services on a commercial or voluntary basis as well as by public agencies. In future, training provided for extension service providers is likely to be sustainable at charge rates that are affordable to farmers.

⁵ ADB. 1998. *Report and Recommendation of the President to the Board of Directors on Proposed Loan to the Socialist Republic of Viet Nam for the Vocational and Technical Education*. Manila (Loan 1655-VIE).

18. The proposed village, commune, and district extension contracts are new in Viet Nam, and mainly practiced now by a few international nongovernment organizations. Under the ongoing ASDP, the Government issued the revised Decree No. 56 in April 2005 on agricultural extension, which provides the basis for promoting various forms of nongovernment extension services. At present, public financing is critical to promote these fee-based extension services, which, as its benefits are demonstrated, may develop into a sustainable model in the longer term. Sustainability of the extension contracts then depends on the demonstration and dissemination of benefits so that individual farmers, farmer groups, local government, enterprises, or others develop ways to fund them.

19. Under the component of rural-based technical and vocational training schools, the upgraded staff will be the existing teaching and administrative staff trained under the Project rather than new staff recruited to increase payrolls. In 6 of the 10 schools, the number of classrooms or students will not increase, so no subsequent increase in the number of teachers is expected. Under the Project, the total number of classrooms, concentrated in expansion of two schools, will be increased from 201 to 215 with a probable need for a comparable 7% increase in teaching staff. The new curricula and supporting equipment and facilities may require certain increases in recurrent costs beyond the needs of the old curricula, but these requirements can only be accurately estimated when the curriculum development processes are completed.

20. The Government has assured ADB that it will provide adequate counterpart budget for the AST activities proposed under the Project. In 2005, the state budget (including both central and provincial budget allocations) for agricultural research was D262.7 billion (\$16.4 million) and for agricultural extension D308.6 billion (\$19.2 million). To ensure longer term sustainability of project impact after completion, the Government has also assured ADB that it will provide adequate funds for operation and maintenance of the equipment and facilities upgraded under the Project. The annual incremental cost for the 10 research institutes is estimated at about \$230,000, and the annual cost for the 10 technical and vocational schools at about \$360,000.

SUMMARY POVERTY REDUCTION AND SOCIAL STRATEGY

A. Linkages to the Country Poverty Analysis

Is the sector identified as a national priority in country poverty analysis? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is the sector identified as a national priority in country poverty partnership agreement? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Contribution of the sector or subsector to reduce poverty in Viet Nam: <p>The agriculture sector accounts for about 21% of the national gross domestic product (GDP), 60% of the total labor force, and 30% of the country's exports. Because many of the poor engage in agriculture as their livelihood and income source, it is the key sector to reduce poverty in the country.</p> <p>While poverty incidence was halved during 1993–2002, the pace and rate of poverty reduction varies among regions. Poverty incidence remains high in upland and remote areas and in pockets of densely populated deltas and river basins. Among ethnic minorities in particular, who have benefited little from economic growth in the past decade, the incidence of poverty is almost static. Lessening disparities and inequality remains an emerging challenge in poverty reduction in Viet Nam.</p> <p>The country's 5-year Socioeconomic Development Plan (2006–2010) continues to underscore investment in the agriculture sector as one of the means to make economic growth socially inclusive and environmentally sustainable.</p> <p>Strengthening agriculture science and technology will contribute to poverty reduction through sustainable economic growth by reforming agricultural research and extension, and increased private investment in agricultural processing. Major opportunities exist for increasing agricultural productivity and product improvement, and ensuring food security and job opportunities. Specific provisions in improving the access and usage of extension services by the poor, women, and ethnic minorities will address the need for improving their rural livelihood.</p>	

B. Poverty Analysis

Targeting Classification: General intervention

What type of poverty analysis is needed?

A comprehensive poverty analysis was conducted during project preparatory technical assistance, with the review of existing documents complemented by rapid rural appraisals (RRAs) in the five project provinces (Dak Nong, Nghe An, Ninh Thuan, Quang Nam, and Thanh Hoa) to investigate the farming practices and livelihoods of remote rural households. Special care was given to analyze the situation of ethnic minorities and their access to and usage of extension services.

Viet Nam's achievements in terms of social development and poverty reduction have been remarkable. Almost one third of the total population was lifted out of poverty in less than 10 years. Economic growth underpinned the rapid poverty reduction.

On the other hand, rural poverty is widespread, particularly in upland and remote areas. The country's overall poverty incidence was estimated at about 23% in 2004; more than 80% of the poor live in rural areas. The pace of poverty reduction in upland and remote areas is much slower than the national average.

Low agricultural productivity, monocropping, and weak competitiveness in markets are major explanatory factors for rural poverty in Viet Nam. The poor in rural areas have limited access to productive resources and improved knowledge and technology, and are more vulnerable to natural disasters such as flood and drought. The most common cause of rural poverty is the lack of productive resources, namely capital, knowledge, and land. A detailed poverty analysis identifies a number of issues that need attention:

- access to and control of land (including forest and forest products), capital, information, and knowledge are limited;
- rural women have proportionally less access to productive resources than men; and
- ethnic minority groups are proportionally much poorer than Vietnamese (Kinh) groups, in particular those living in the remote districts.

Other important issues are

- access to training, health, and sanitation facilities,
- community participation in decision making, and
- recognition of cultural and environmental diversity.

Agriculture science and technology, including research, extension, and training, have an important role to play in poverty reduction. However, the current approach and lowland-biased views in agricultural production is not effective or functional to meet the unmet demand. This was one of the main findings of the RRAs conducted during project formulation. One of the thrusts of the Project is to make agricultural research, extension, and training services more relevant to poor farmers' existing needs and priorities, thereby improving their skills and knowledge and reducing rural poverty.

C. Participation Process

Is there a stakeholder analysis?

☒ Yes

☐ No

The formulation of the Agriculture Science and Technology Project has involved comprehensive consultations and discussions with a wide range of stakeholders. Stakeholder opinions and inputs have been sought through a number of modalities, including key informant interviews, participatory workshops, focus group discussions, surveys and questionnaires, and the RRAs. Stakeholders have been consulted at all levels, including ministries, departments, research institutes, extension centers, universities, provincial people's committees, districts, communes, and farmer groups. Consultations have also included representatives of international nongovernment organizations (NGOs) and external funding agencies operating in the agriculture sector in Viet Nam.

RRA surveys were conducted in the five project provinces to identify farmers' needs and priorities in information, knowledge, and extension advice and those of the poor, women, and ethnic minorities. This consisted of an extensive RRA in 17 districts. The RRA was complemented by informant interviews, which included the managers of factories, entrepreneurs, and NGO staff.

Is there a participation strategy?

☐ Yes

☒ No

The Project will adopt a participatory approach during the implementation phase. In particular, provincial agricultural extension plans will be formulated through an extensive consultative process with the provincial extension advisory councils, which include a wide range of key stakeholders in the respective project provinces. To increase the participation of the poor so that they benefit from the Project, special care will be given to enhance participation of potential women and ethnic minority group beneficiaries through intense dissemination activities and focused awareness campaigns. For this purpose, the Project will develop the capacity of associations, farmer groups, and local NGOs. NGOs are expected to play a crucial role in fostering social mobilization in the field and reach the most vulnerable and excluded groups such as ethnic minority communities and poor farmers in upland and remote areas.

D. Gender Development

Strategy to maximize impacts on women:

Gender is fully integrated in the country's socioeconomic development plan, which supports actions to reduce gender disparities and ensure empowerment. The Government is committed to gender equality through policies, strategies, and actions. The National Strategy for the Advancement of Women in Viet Nam by 2010 is in place with discrete targets for 2010, which relate to equal rights for women in labor, employment, education, and health care; and an increase in the number of woman candidates for leadership positions at all levels and in all sectors. The Strategy calls for increased participation of women so that women will account for 50% of all participants in technical training programs and beneficiaries of public services.

In accordance with the Government strategies and commitments, the Project has mainstreamed gender in its scope. The impact on women will be positive as the Project will incorporate specific means to increase awareness of gender issues and promote women's knowledge and participation in advanced agriculture science and technology. Negative impacts are not expected. A gender action plan was prepared using the mainstreaming approach to ensure a positive impact and mitigate the potential risk of exclusion.

Has an output been prepared? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No A social assessment of the Project was prepared, including a gender assessment and strategy with an action plan. From the assessment, the overall impact on gender is considered to be positive.

E. Social Safeguards and Other Social Risks

Item	Significant/ Not Significant/ None	Strategy to Address Issues	Plan Required
Resettlement	<input type="checkbox"/> Significant <input type="checkbox"/> Not significant <input checked="" type="checkbox"/> None	The Project will include small-scale civil works mainly for rehabilitation of laboratory and library facilities of rural-based technical and vocational training schools. These facilities will be built in the compound of the existing institutions. Land acquisition and resettlement will not be required.	<input type="checkbox"/> Full <input type="checkbox"/> Short <input checked="" type="checkbox"/> None
Affordability	<input type="checkbox"/> Significant <input type="checkbox"/> Not significant <input checked="" type="checkbox"/> None	No impact on affordability. One of the objectives of the Project is to improve the access of poor farmers to quality and affordable extension services at the grassroots level.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Labor	<input type="checkbox"/> Significant <input type="checkbox"/> Not significant <input checked="" type="checkbox"/> None	Positive impact is expected through an increased number of better-qualified graduates from rural-based technical and vocational training schools. The creation of employment opportunities from agricultural diversification and increased production as a result of better access to extension services and improved agricultural research.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Indigenous Peoples	<input checked="" type="checkbox"/> Significant <input type="checkbox"/> Not significant <input type="checkbox"/> None	The Project will have a significantly positive impact on indigenous people to reduce economic and social gaps through extension services and research. The indigenous people's action plan was prepared to include the full participation of the indigenous people in project activities and to ensure that indigenous people in upland and remote areas will benefit from the Project.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Other Risks and/or Vulnerabilities	<input type="checkbox"/> Significant <input type="checkbox"/> Not significant <input checked="" type="checkbox"/> None	No other risks or vulnerabilities are anticipated.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

SUMMARY ENVIRONMENTAL ANALYSIS

A. Screening of Potential Environmental Impacts and Mitigation Measures

1. The Project was screened for environmental impacts through an initial environmental examination with the use of (i) matrices developed in consultation with stakeholders, and (ii) impact significance criteria consistent with the *Environmental Assessment Guidelines of the Asian Development Bank* (2003). The screening revealed that potential environmental impacts of project activities are generally minor, and that the project scope to support the strengthening of the national agriculture science and technology (AST) system would have mainly indirect positive impacts on agricultural production.

B. Environmental Impacts Associated with Civil Works

2. The research and training components will involve minor upgrading and new construction at a research institute (the Viet Nam Academy of Agricultural Science) and 10 selected technical and vocational training schools. A likely scope of upgrading and new construction work covers small-scale civil works for \$20,000–\$30,000 per contract at the research institute (a greenhouse and a pilot tea plantation); and \$100,000–\$200,000 per contract for each school for libraries, classrooms, and laboratories. The total amount of civil works for the whole Project is about \$1.6 million excluding contingencies. Related civil work will be done on the existing compounds and will not require land acquisition and resettlement.

3. The small-scale civil work may cause potential negative impacts such as noise, dust, and demolition waste. These negative impacts are likely to be minor and short term, and can be mitigated with the proposed mitigation measures including restricted hours for work and transportation of materials and appropriate waste disposal and management. Old insulation materials and pipes may contain asbestos and lead, and an on-site environmental monitoring plan will be required as part of overall project management to ensure appropriate disposal of hazardous wastes. Chemical management at the laboratories of the selected 10 training schools will be strengthened through developing and implementing the laboratory management manuals to improve laboratory operation. During the design phase, any environmental work will be done prior to civil works in order to obtain certification from the provincial department of natural resources and environment, if necessary, and comply with the Government's regulations.

C. Environmental Impacts Associated with Procurement

4. All components include the procurement of equipment and materials. The research component will procure essential laboratory equipment for the selected agricultural research institutes in the areas of crop production, livestock, postharvest technology, natural resources management, and agricultural policy planning. The extension component will procure audio-visual and office equipment for training activities. The rural-based training component will mainly procure equipment and materials used for classrooms, libraries, and laboratories. The procured equipment and materials are unlikely to cause adverse environmental impacts. Environmental criteria will be included as part of the procurement criteria to ensure that (i) procured goods are not listed in the prohibited items in the national laws and regulations, and do not include luxurious, military, or extremely hazardous items not related to the project activities; and (ii) energy conservation, and reuse and recycling considerations for new office equipment will be taken into account as appropriate.

D. Environmental Enhancement Measures

5. The environmental screening did not find any significant negative impacts generating from the proposed project activities. The Project includes numerous opportunities to introduce environment enhancement measures. Minor or significantly positive impacts can be expected when increased attention on environmental issues is made during project implementation. Under the research component, minor positive environmental impacts are expected with the inclusion of environmental criteria in funding research proposals and staff training. Under the extension component, integrating environmental considerations into the training programs for extension staff, farmers, and service providers can contribute to improved understanding of sustainable agricultural practices. Increased attention to environmental issues in the curriculum development for training schools can promote improved knowledge on the close relationship between agriculture and environment, and facilitate application of gained skills in the agriculture sector. The scope of environmental enhancement measures will be determined during the detailed design.

E. Institutional Requirements and Environmental Monitoring Plan

6. The Ministry of Agriculture and Rural Development (MARD) will be the Executing Agency for the Project and be responsible for overall project implementation. MARD will establish a central project management unit (CPMU) in its Agricultural Projects Management Board. The CPMU, headed by a project director, will ensure overall project implementation and coordination within MARD and with other relevant agencies of the Government, including the Ministry of Natural Resources and Environment. A provincial project management unit will be established under the provincial department of agriculture and rural development in each of the five project provinces and be responsible for overall management and supervision of the project activities related to agricultural extension in the province. In addition, project management units may be established at participating research institutes, and technical and vocational training schools. Table A12 describes the overall environmental responsibilities.

Table A12: Institutional Responsibilities for the Environmental Monitoring Plan

Institution	Responsibility
Project steering committee	Facilitate interministerial coordination and provide overall guidance for project implementation
Ministry of Agriculture and Rural Development (Executing Agency)	Provide overall project supervision, including the environmental monitoring plan (EMP)
Central project management unit (CPMU)	Obtain any necessary environmental certification from the Ministry of Natural Resources and Environment (MONRE); (ii) supervise the EMP, coordinating with MONRE, and report to the interministerial project steering committee (assisted by the international consultant)
Provincial project management unit, and project management units of participating research institutes and training schools as deemed appropriate	Implement the EMP and report progress to the CPMU (assisted by international and national consultants)
Ministry of Natural Resources and Environment	Provide overall guidance for project implementation (advisory role)
Provincial Department of Natural Resources and Environment	Oversee and issue environmental certificate for upgrading work of 10 technical and vocational training schools if necessary and provide guidance on the EMP

Sources: Asian Development Bank. 2003. *Technical Assistance to the Socialist Republic of Viet Nam for Preparing the Agriculture Science and Technology Project* (Financed by the Japan Special Fund). Manila. (TA 4194-VIE); Ministry of Agriculture and Rural Development, the Government of Viet Nam.

7. Implementation of the environmental monitoring plan (EMP) will be a key responsibility of the CPMU. The EMP will focus on (i) procurement of civil works, equipment, and materials; and (ii) implementation of environmental enhancement measures. International (2 person-months) and national (11 person-months) environmental consultants will assist the CPMU and provincial project management units to develop site-specific EMP and monitor EMP progress on a regular basis. The total cost for implementing the EMP for the Project is tentatively estimated at about \$140,000, including expenses for (i) environmental assessment works for classrooms, school laboratories, and libraries (\$20,000); (ii) required staff and consultants (\$110,000); and (iii) miscellaneous costs for equipment and field trips (\$10,000). The cost of implementing the EMP represents about 0.3% of the total project cost, and mainly consists of expenditures for human resources.

F. Public Consultation and Information Disclosure

8. Extensive consultation was conducted from April 2004 through February 2005. During the first phase, the consultant team carried out the task of sector review, issue identification, and draft component design based on a multistakeholder participatory approach. This involved an extensive series of consultative activities including key informant interviews, rapid rural appraisals, requests for comments, workshops, focus group meetings, and surveys with more than 400 individuals, ranging from the ministries to grassroots stakeholders in farm households.

9. In addition, a market information needs survey was carried out during project formulation in eight agroecological zones in nine provinces. This is the first of its type undertaken in Viet Nam. The objective of the survey was to obtain information from farmers and traders on (i) the current sources of market information, (ii) preferred sources of information, (iii) importance of different information types, (iv) frequency of information needs, (v) willingness to pay for information, and (vi) content of user-pay information services.

10. Environment and natural resources management was an integral part of the project formulation exercise. During project implementation, close consultations particularly with farmers will continue in relation to the introduction of improved AST information and knowledge, and any concerns among farmers and other key stakeholders will be adequately incorporated into the project activities.

G. Conclusion

11. The Project will contribute to sustainable and equitable growth of the agriculture sector and poverty reduction through strengthening of the national AST system. It will facilitate technology development and dissemination, and improve the quality of agriculture and agro-based products for domestic and export markets. The Project will complement the ongoing and planned activities of external funding agencies and NGOs, and will be implemented based on the investment needs of the relevant agricultural research institutes, organizations involved in agricultural extension, and technical and vocational training schools.

12. The environmental screening of the Project yielded (i) no significant negative impacts, (ii) some minor negative impacts that can be mitigated, (iii) some neutral impacts, (iv) some minor positive impacts that can be enhanced, and (v) some potentially significant positive impacts. Specific recommendations are included in the EMP. The initial environmental examination concluded that no further preparatory environmental studies were required.