

ASIAN DEVELOPMENT BANK

TAR:REG 38020

TECHNICAL ASSISTANCE
(Financed by the Japan Special Fund)

FOR

STRENGTHENING CAPACITY AND REGIONAL COOPERATION IN

ADVANCED AGRICULTURAL SCIENCE AND TECHNOLOGY

IN THE

GREATER MEKONG SUBREGION

December 2004

ABBREVIATIONS

ADB	–	Asian Development Bank
ASEAN	–	Association of Southeast Asian Nations
Codex	–	Codex Alimentarius Commission
ESCAP	–	United Nations Economic and Social Commission for Asia and the Pacific
FAO	–	Food and Agriculture Organization of the United Nations
GMO	–	genetically modified organism
GMS	–	Greater Mekong Subregion
IARC	–	international agricultural research center
IPR	–	intellectual property right
TA	–	technical assistance
UNEP	–	United Nations Environment Programme
WGA	–	Working Group on Agriculture
WTO	–	World Trade Organization

TECHNICAL ASSISTANCE CLASSIFICATION

Targeting	–	General intervention
Classification	–	
Sector	–	Agriculture and natural resources
Subsector	–	Agriculture sector development
Themes	–	Regional cooperation, Sustainable economic growth
Subtheme	–	Developing rural areas

NOTE

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

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I. INTRODUCTION

1. The countries in the Greater Mekong Subregion (GMS)—comprising Cambodia, Lao People's Democratic Republic, Myanmar, Thailand, Viet Nam, and Yunnan Province of the People's Republic of China—established a Working Group on Agriculture (WGA) in January 2003 to facilitate consultations on common issues in the agriculture sector and identify opportunities for increased regional cooperation. On the basis of discussions at the meetings of the WGA in 2002 and 2003, the Asian Development Bank (ADB) conducted a rapid assessment of agricultural biotechnology in GMS in November 2003.¹ As a result of the assessment and subsequent consultations, ADB and GMS countries reached an understanding on the objective, scope, financing plan, and implementation arrangements for this Technical Assistance (TA).² The TA is included in ADB's regional cooperation strategy and program (2004–2008) for GMS. The TA framework is in Appendix 1.

II. ISSUES

2. GMS countries had an average rate of gross domestic product growth of more than 5% per annum during the last 5 years, and fully recognize the need for sustainable agricultural growth to maintain economic strength and reduce poverty in the region, where about 62 million or 25% of the total population live below the poverty line. In addition, there are growing concerns in GMS about (i) widening gaps between rural and urban areas, and between rich and poor people; (ii) unsustainable management of the environment, which provides livelihood for rural communities; and (iii) special needs of vulnerable ethnic minorities in rural areas. Providing increased economic opportunities in rural areas will be crucial in addressing these concerns. Due to increased globalization of trade in agricultural and agro-based commodities as reflected in the recent entry of some GMS countries in the World Trade Organization (WTO), more effective use of advanced agricultural science and technology is required to ensure food security, and promote agricultural diversification and commercialization. Use of advanced science and technology will also increase the access of GMS products to international markets through improvement of food safety and quality standards, and lead to higher production values through identification of innovative products and marketing.

3. Advanced agricultural science and technology, in particular agricultural biotechnology,³ offers an opportunity, largely untapped, to sustainably increase productivity and food supply, and will contribute to addressing food security issues and reducing poverty in GMS. The use of technology has the potential to increase plant and animal productivity, improve product and nutritional quality, enhance crop resistance to pesticides and herbicides, and increase crop capacity to grow in difficult soil conditions. Researches into molecular genetics resulted in new techniques for more precise and rapid improvements in economically important strains of crops. Other biotechnology applications like micropropagation form the basis for large-scale multiplication of improved plant varieties.

4. However, diverse views on agricultural biotechnology still exist often because of limited access to accurate knowledge and scientific information. The public is concerned about potential health and environmental risks related to the use of agricultural biotechnology, for

¹ ADB. 2004. *Agricultural Biotechnology in the Greater Mekong Subregion* (Working Paper). Manila. The study was carried out by Cornell University.

² The TA first appeared in *ADB Business Opportunities* (Internet edition) on 9 September 2004.

³ Broadly defined as application of any agricultural technology that uses biological systems, living organisms, or derivatives thereof, to make or modify products for specific use. This definition is used in the Convention on Biological Diversity adopted at the 1992 Earth Summit.

example, creation of super weeds, increased antibiotic resistance, and occurrence of allergies. Appropriate policy and regulatory frameworks are also required to ensure that such technology is used safely and potential risks are minimized. Improved policy and regulatory frameworks will promote public-private partnerships for advanced research and development, and enhance knowledge and skills to benefit smallholders, increase productivity, and upgrade food safety and product quality standards.

5. ADB conducted a comprehensive study of agricultural biotechnology in 2000 to explore its potential in food security and poverty reduction.⁴ The study highlighted the need for continued public and private investment in biotechnology development as a means to facilitate poverty reduction and food security in Asia, and to strengthen the extension services and the regulatory framework to deliver the benefits of advanced technology to small farmers. In November 2003, ADB also carried out a rapid assessment of the situation of agricultural biotechnology in GMS. The assessment highlighted the urgent need to (i) increase understanding and knowledge of biotechnology issues in all GMS countries, (ii) ensure that appropriate policies and regulatory frameworks are in place, and (iii) strengthen the technical capacity of relevant agencies and research institutes in agricultural science and technology. The assessment also indicated that inequalities that currently exist in the level of technology and private enterprise development and in preparedness in terms of legal and regulatory frameworks among GMS countries should be considered in formulating assistance programs suitable for the situation of each country.

6. Inadequate understanding and knowledge will substantially limit the use of advanced agricultural science and technology, and may result in inappropriate systems for technology development and unregulated flows of uncertified crop seeds and products, which may cause ecological and health problems. As of August 2004, all GMS countries had either signed or ratified the Cartagena Protocol on Biosafety, agreeing to protect biological diversity from the potential risks posed by genetically modified organisms (GMOs) resulting from modern biotechnology, including agricultural crops that have been genetically modified for greater productivity or for resistance to pests or diseases.⁵ The Protocol encourages the participating countries to establish rules and procedures for the transfer, handling, and use of GMOs under conditions of safety, particularly for their cross-border movement. At present, GMS countries are at various stages of formulating relevant laws and regulations to implement the Protocol.

7. Establishment of the legal framework for protecting intellectual property rights (IPRs) relating to biotechnology is also being debated globally in view of the need for ensuring appropriate returns for private investment in biotechnology research and development, and for facilitating access of resource-poor farmers to improved technology and its benefits. These factors need to be taken into account in the discussion on the regulatory framework for IPR protection in collaboration with other agencies, including WTO and the United Nations Environment Programme (UNEP).

8. In relation to the use of advanced agricultural science and technology, appropriate systems to ensure food safety need to be established and strengthened to make food products free from possible health risks from GMOs, insecticide residues, harmful synthetic agents and adulteration. The quick analysis of these substances, whose use is becoming rampant in Asia, is urgently required with effective enforcement measures. In addition, the methods for post-harvest preservation of fresh foods need to be constantly upgraded to meet stringent product

⁴ ADB. 2001. *Agricultural Biotechnology, Poverty Reduction, and Food Security* (Working Paper). Manila.

⁵ Convention on Biological Diversity. 2000. *Cartagena Protocol on Biosafety* (Supplementary Agreement). Montreal.

standards in international markets. Disseminating correct information and upgrading analytical skills for detection of harmful substances and GMOs are urgently needed in GMS countries.

9. Other international and regional agencies provide GMS countries with technical and financial assistance programs for improving national systems to ensure biosafety and food safety standards. Since June 2001, UNEP, under the Global Environment Facility, has assisted countries to develop national frameworks to effectively regulate and administer activities for biosafety. The Association of Southeast Asian Nations (ASEAN) assists ASEAN countries in facilitating the safe cross-border movement and use of GMOs through harmonization of national regulations and guidelines. The United Nations Food and Agriculture Organization (FAO) provides capacity-building support to enhance food security and increase farmers' income based on safe and judicious use of modern biotechnology. In the area of food safety, ASEAN collaborates with the European Union and the Government of Japan to support regional activities in ASEAN to upgrade and harmonize food standards and control enforcements, and reduce technical barriers to trade of food products. FAO and the World Health Organization, which help implement the activities of the Codex Alimentarius Commission (Codex) relating to international food safety standards, will support some GMS countries to increase awareness about food safety issues and improve technical capacity in food analysis. As there are similar initiatives by bilateral agencies and international agricultural research centers (IARCs), this TA will hold special efforts like joint seminars and workshops to ensure effective coordination and complementarity with the activities of other agencies.

10. The long-term cooperation framework of GMS countries emphasizes that a series of infrastructure projects should be closely linked with agriculture development at the national level, and that regional issues in the agriculture sector should be effectively addressed. The TA is in line with this long-term framework to realize the potential of GMS countries, and ensure equitable and sustainable development processes through increased regional cooperation. The TA will also help promote private sector participation in the agriculture sector, and improve farmers' access to advanced agricultural science and technology. The TA is strongly supported by GMS countries, and will further promote the WGA work program.

III. THE TECHNICAL ASSISTANCE

A. Purpose and Output

11. The TA will strengthen capacity and regional cooperation for the safe use of advanced agricultural science and technology and for the related food safety in GMS countries, thereby contributing to sustainable agricultural growth in the region. At TA completion, it is expected that (i) basic awareness about advanced agricultural science and technology and related food safety issues will be increased among key stakeholders in GMS countries, (ii) the technical capacity of the relevant institutions in GMS will be strengthened, and (iii) appropriate policy and regulatory frameworks will be enhanced in GMS countries.

B. Methodology and Key Activities

12. The TA will have the following components:

- (i) **Basic awareness-raising activities.** This component will aim at disseminating accurate information and knowledge about the benefits and risks in the use of agricultural biotechnology and agrochemicals. Representatives of agricultural producers and consumers will be the primary targets of these activities. Use of

mass media and web sites for wider public campaigns may be considered to increase general awareness.⁶

- (ii) **Advanced technical training programs.** Training programs on advanced technical subjects will be provided for staff of the relevant government agencies, and research and academic institutions. Provision of practical hands-on experience in tissue culture, molecular breeding, food microbiology, and GMO detection with the use of well-equipped laboratory facilities in GMS will be considered for the regional training programs. Since the appropriate use of biotechnology requires adequate capacity and knowledge of conventional plant breeding techniques, priority may be given to training programs on conventional techniques in some GMS countries. Balanced gender representation will be considered in selecting participants for the awareness-building activities, and the training programs.
- (iii) **Regional dialogue on common strategy and country action plans.** In coordination with the discussions of the WGA, the TA will enhance their regular policy dialogue on relevant topics such as informal cross-border flow of GMOs, enforcement of biosafety regulations, and IPR protection.
- (iv) **Support for enhanced policy and regulatory frameworks.** The TA will assist GMS countries in organizing necessary workshops to establish and strengthen appropriate policy and regulatory frameworks for biosafety, IPR protection, and food safety. This activity will be carried out in close consultation with WTO, UNEP, and IARCs. In relation to this, necessary technical and advisory support for strengthening and institutionalizing information and monitoring systems will be provided to GMS countries.

13. A longer-term framework for collaboration between GMS countries and ADB on the region's common issues in the agriculture sector is being established. Improved capacity in advanced agricultural science and technology is one of the high-priority issues in the region as indicated during the WGA meetings. Under the TA, advanced technical knowledge and expertise, and well-equipped facilities existing in GMS countries will be fully utilized to achieve a sustainable framework for cooperation in GMS. As the training and awareness-building programs to be implemented under the TA cover a wide range of specialized subjects, the TA programs will feature resource persons with highly technical and specialized knowledge from the relevant research institutes, academic institutions, and other organizations in GMS and countries of other regions.

C. Cost and Financing

14. The total cost of the TA is estimated at \$1,200,000 equivalent, comprising \$726,000 in foreign exchange and \$474,000 equivalent in local currency. ADB will provide \$1,000,000 equivalent to finance the entire foreign exchange cost and part of the local currency cost, amounting to \$274,000 equivalent. The TA will be financed on a grant basis by the Japan Special Fund, funded by the Government of Japan. The balance of the local currency costs, amounting to \$200,000 equivalent, will be met by GMS governments in kind to cover counterpart staff support, training and seminar facilities, and office and administrative expenses. The Government of Thailand indicated it would consider financing part of the local currency cost of the TA, and selected training programs proposed under the TA. Detailed cost estimates are in Appendix 2.

⁶ In this context, the proposed use of mass media and web sites under the TA can be linked to the establishment of an agricultural cooperative network in GMS proposed by the Government of the People's Republic of China.

D. Implementation Arrangements

15. ADB will be the Executing Agency for the TA. All six GMS countries will be participating in the TA. Their governments will designate their implementing agencies from the relevant ministries, research institutes, or academic institutions.⁷ The WGA coordinators, who are nominated by their respective GMS governments as national focal points for implementing WGA activities, will be fully involved in the TA to ensure close coordination among stakeholder agencies. To involve a wide range of stakeholders in the respective countries, GMS governments will establish a national task force or committee at TA inception to formulate or strengthen biosafety policy and regulatory frameworks, or use the existing national committee for this purpose.

16. The TA will be implemented over 2 years from April 2005. The TA will require 28 person-months of international and 42 person-months of domestic consulting services. The international specialists (person-months are given in parenthesis) will have expertise in agricultural biotechnology and team leadership (20), biosafety policy (2), food safety (3), and information and monitoring systems (3). The domestic specialists from GMS countries will have expertise in agricultural biotechnology (16), food safety (9), information and monitoring systems (9), environment (4), and social analysis (4). An academic institution, an international or regional research center, or other organizations, which are technically well-qualified to implement the tasks of the TA, will provide the specialist services required under the TA. The TA will also use technical resource persons and facilities available in GMS. A team of specialists will be selected and engaged in accordance with ADB's *Guidelines on the Use of Consultants* and other arrangements satisfactory to ADB for engaging domestic specialists. The quality- and cost-based selection method will be used, and simplified technical proposals invited from the short-listed institutions. Necessary office and laboratory equipment will be purchased in accordance with ADB's *Guidelines for Procurement*.

17. Regional tripartite review meetings involving GMS government representatives, the specialists engaged under the TA, and ADB will be organized at least three times during the TA period to discuss the inception, midterm, and draft final reports to review the progress and outputs of the TA, and resolve any implementation issues. ADB will field TA review missions in conjunction with these tripartite review meetings. The specialist team will prepare (i) an inception report including a detailed work program, to be submitted within 1 month of the start of the TA; (ii) a midterm report on the TA activities during the first year and any revisions of the TA work program, to be submitted at the end of the first year; (iii) a draft final report about 2 months before TA completion; and (iv) a final report upon completion of the TA. The specialist team of the TA will also prepare brief quarterly progress reports based on the format agreed upon at TA inception, and technical working papers as required under the TA. The final report will be translated into the respective languages of GMS countries as required. The TA outputs will also be reviewed by ADB's sector committee for agriculture and natural resources. The outline terms of reference for the specialists are in Appendix 3.

IV. THE PRESIDENT'S DECISION

18. The President, acting under the authority delegated by the Board, has approved the provision of technical assistance not exceeding the equivalent of \$1,000,000 on a grant basis for Strengthening Capacity and Regional Cooperation in Advanced Agricultural Science and Technology in the Greater Mekong Subregion, and hereby reports this action to the Board.

⁷ The specialist team engaged under the TA will be stationed mainly at the National Science and Technology Development Agency of Thailand during the TA period.

TECHNICAL ASSISTANCE FRAMEWORK

Design Summary	Performance Indicators and Targets	Monitoring Mechanisms	Assumptions and Risks
<p>Goal</p> <p>Sustainable agricultural growth in the Greater Mekong Subregion (GMS) accelerated</p>	<ul style="list-style-type: none"> • Increase in average agricultural growth rate, currently estimated at about 2.4% per annum in GMS (during 1998–2002 except for Myanmar and Yunnan Province of the People's Republic of China) • Reduction in poverty incidence, currently estimated in the range of 10–40% in GMS countries 	<ul style="list-style-type: none"> • National accounts in GMS countries • Household income surveys and poverty assessments for GMS countries • Sector and economic studies of the Asian Development Bank (ADB) 	
<p>Purposes</p> <p>Strengthen the capacity for the safe use of advanced agricultural science and technology and related food safety in GMS</p>	<ul style="list-style-type: none"> • Relevant laws, regulations and policies for biosafety and related food standards increasingly being practiced in GMS countries • Reduction in incidence of illegal use or sale of information and products related to agricultural biotechnology 	<ul style="list-style-type: none"> • Dialogue with the country focal points of GMS Working Group on Agriculture (WGA) and with other key stakeholders in GMS, including international agricultural research centers (IARCs), and the private sector • Information from the Codex Alimentarius Commission (Codex) • Agriculture sector studies of ADB and other agencies in GMS 	<p>Assumptions</p> <ul style="list-style-type: none"> • Commitment of GMS governments to carrying out awareness-building activities about the safe use of agricultural biotechnology and related food products • Active cooperation of IARCs and the private sector involved in agricultural biotechnology • Effective mechanisms for enforcing the relevant laws, regulations, and policies
<p>Outputs</p> <p>Increased basic awareness about the benefits and risks of advanced agricultural science and technology and related food products among key stakeholders in GMS</p>	<ul style="list-style-type: none"> • Correct information and knowledge about risks widely disseminated • Issuance of internationally recognized certificates increased 	<ul style="list-style-type: none"> • Dialogue with WGA focal points and other key stakeholders • Information from Codex • Agriculture sector studies of ADB and other agencies in GMS 	<p>Assumptions</p> <ul style="list-style-type: none"> • Active participation of key stakeholders in the awareness-building activities

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Design Summary	Performance Indicators and Targets	Monitoring Mechanisms	Assumptions and Risks
<p>Adequately trained technical staff of agencies and research institutes involved in advanced agricultural science and technology in GMS countries</p> <p>Appropriate policy and regulatory frameworks enhanced with relevant information and monitoring systems for biosafety and related issues in line with the framework adopted for other countries of the Association of Southeast Asian Nations (ASEAN)</p> <p>Strengthened regional cooperation on subregional strategies and country action plans among GMS countries on agricultural biotechnology, and related intellectual property rights and food safety issues</p>	<ul style="list-style-type: none"> • At least 3 persons from each GMS country participating in the regional technical training programs organized under the technical assistance (TA) • Adequate number of in-country technical training programs organized in some GMS countries • Necessary policy and regulatory frameworks being finalized or practiced in GMS countries • Compatibility with ASEAN guidelines being ensured • Related strategies, action plans, and agreements among GMS countries developed • Relevant discussions of WGA increased 	<ul style="list-style-type: none"> • Dialogue with the WGA focal points and other key stakeholders • Information from Codex • Agriculture sector studies of ADB and other agencies in GMS • Dialogue with the WGA focal points and other key stakeholders • Information from Codex • Agriculture sector studies of ADB and other agencies in GMS • Dialogue with the WGA focal points and other key stakeholders • Information from ASEAN, the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), and Codex 	<ul style="list-style-type: none"> • Active participation of technical staff involved in agricultural science and technology in the training programs • Effective coordination with training programs of other international and bilateral agencies and IARCs • Continued commitment of GMS countries to increased regional collaboration in the agriculture sector
<p>Key Activities</p> <p>Assist the establishment of national task forces or committees for appropriate regulatory and policy frameworks</p> <p>Support national information and monitoring systems on agricultural biotechnology and related food safety</p>	<ul style="list-style-type: none"> • Task forces or committees established within 3 months of TA inception • Review of the existing information and monitoring systems completed within 6 months of the TA 	<ul style="list-style-type: none"> • Dialogue with the WGA focal points and other key stakeholders • Information from ASEAN, ESCAP, and Codex • Dialogue with the WGA focal points and other key stakeholders • TA progress reports 	<p>Assumptions</p> <ul style="list-style-type: none"> • Commitments of GMS governments to strengthen regulatory and policy frameworks for the use of agricultural biotechnology and food safety standards • Effective coordination mechanisms for information collection and dissemination

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Design Summary	Performance Indicators and Targets	Monitoring Mechanisms	Assumptions and Risks
<p>Conduct seminars, and awareness-building campaigns through mass media</p> <p>Provide advanced technical training programs, and regional study visits</p> <p>Organize senior-level dialogue for subregional strategies and country action plans within GMS for agricultural biotechnology and related food safety</p>	<ul style="list-style-type: none"> • First seminars within 3 months of the TA • Arrangements with mass media within 6 months of the TA • Training needs assessments within 3 months of the TA • Training programs initiated within 6 months of the TA • First senior-level dialogue organized within 6 months of the TA 	<ul style="list-style-type: none"> • Dialogue with the WGA focal points and other key stakeholders • External funding agencies • TA progress reports • Dialogue with the WGA focal points and other key stakeholders • TA progress reports • Dialogue with the WGA focal points and other key stakeholders • Information from ASEAN, ESCAP, and Codex 	<ul style="list-style-type: none"> • Active participation of key stakeholders • Close cooperation from the relevant IARCs • Timely provision of counterpart support • Close collaboration of other relevant training programs • Continued commitments of GMS countries to increased subregional cooperation
<p>Inputs</p> <p>Consulting services</p> <p>ADB Financing</p> <p>Government Financing</p>	<p>28 person-months of international specialists 42 person-months of domestic specialists in GMS countries</p> <p>\$1,000,000</p> <p>\$200,000</p>	<ul style="list-style-type: none"> • Dialogue with the WGA focal points and other key stakeholders • ADB missions • TA progress reports 	<p>Assumption</p> <ul style="list-style-type: none"> • Timely provision of counterpart support

COST ESTIMATES AND FINANCING PLAN
(\$'000)

Item	Foreign Exchange	Local Currency	Total Cost
A. Asian Development Bank Financing^a			
1. Specialists			
a. Remuneration and Per Diem			
i. International Specialists	560.0	0.0	560.0
ii. Domestic Specialists	0.0	126.0	126.0
b. International and Local Travel ^b	18.0	24.0	42.0
c. Reports and Communications	8.0	0.0	8.0
2. Materials and Equipment ^c	11.0	0.0	11.0
3. Training, Seminars, and Workshops ^d			
a. In-country Training Programs	0.0	70.0	70.0
b. Regional Training Programs	45.0	0.0	45.0
c. Seminars and Workshops	25.0	0.0	25.0
4. Studies, and Media and Computer Services ^e	0.0	12.0	12.0
5. Miscellaneous Administrative Costs	0.0	20.0	20.0
6. Representative for Contract Negotiations ^f	4.0	0.0	4.0
7. Contingencies	55.0	22.0	77.0
Subtotal (A)	726.0	274.0	1,000.0
B. Government Financing			
1. Office Accommodation	0.0	36.0	36.0
2. Remuneration and Per Diem of Counterpart Staff	0.0	96.0	96.0
3. Training and Seminar Facilities	0.0	44.0	44.0
4. Other Administrative Expenses	0.0	24.0	24.0
Subtotal (B)	0.0	200.0	200.0
Total	726.0	474.0	1,200.0

^a Financed by the Japan Special Fund, funded by the Government of Japan.

^b Domestic airfare, in-city transportation, and vehicle hire.

^c Office materials, computer equipment, and materials and equipment for laboratories. The equipment purchased under the TA and installed at the counterpart agencies will be transferred to these agencies at TA completion.

^d Costs of materials for training programs, seminars and workshops, and travel expenses of participants.

^e Expenses for local subcontracts.

^f The Government of Thailand may be invited to contract negotiations to confirm the details of counterpart support.

Source: Asian Development Bank estimates.

OUTLINE TERMS OF REFERENCE FOR SPECIALISTS

1. The specialists recruited under the proposed technical assistance (TA) will undertake the following assignments. The team leader will be the international agricultural biotechnology specialist.

A. Agricultural Biotechnology Specialists (international, 20 person-months; domestic, 16 person-months)

2. The specialists will
- (i) formulate a detailed work program based on the past assessments of agricultural biotechnology by the Asian Development Bank (ADB) and in close consultation with ADB, the governments of the Greater Mekong Subregion (GMS), and other stakeholders in the region, including the private sector and civil society organizations;
 - (ii) design, organize, and facilitate activities raising awareness of current issues, benefits, and risks in the use of advanced agricultural science and technology, and prepare relevant materials to be used for these activities;
 - (iii) design and conduct technical training programs, taking into account the participants' varied backgrounds, needs, and different levels of technology and private enterprise development in the agriculture sector in their home countries;
 - (iv) assess and select appropriate regional research institutes and laboratory facilities to be used for advanced technical training programs relating to methods and techniques in tissue culture, micropropagation and molecular breeding;
 - (v) in collaboration with other specialists, provide support in establishing and strengthening biosafety policy and regulatory frameworks, and information and monitoring systems for agricultural biotechnology and related food safety issues;
 - (vi) assist the representatives of GMS countries in conducting regional dialogue on a common strategy and country action plans on such topics as informal cross-border flow of genetically modified organisms (GMOs), enforcement of biosafety regulations, participation of the private sector in research and development, and protection of intellectual property rights (IPRs) in agricultural biotechnology;
 - (vii) identify, in collaboration with the information and monitoring systems specialists, appropriate indicators for monitoring and impact of the use of agricultural biotechnology;
 - (viii) identify and recommend measures to improve the management of national systems for advanced agricultural science and technology and related food safety in GMS countries;
 - (ix) liaise with multilateral and bilateral funding agencies and international agricultural research centers in connection with TA activities, and ensure close coordination and complementarity with their programs;
 - (x) help organize the regional tripartite review meetings for the TA among GMS governments, the specialist team engaged under the TA, and ADB;
 - (xi) make necessary arrangements for the use of media and computer services for wider public campaigns about the use of advanced agricultural science and technology and related food safety issues;
 - (xii) procure materials and equipment for offices and laboratories required for the TA activities in accordance with ADB's *Guidelines for Procurement*; and
 - (xiii) prepare inception, midterm, draft final, and final reports of the TA in collaboration with other specialists.

B. Biosafety Policy Specialist (international, 2 person-months)

3. The specialist will

- (i) determine the exact status of the development of biosafety policy and regulations to implement the Cartagena Protocol of Biosafety and protect IPRs in agricultural biotechnology based on ADB assessments and in close consultation with the World Trade Organization and the United Nations Environment Programme;
- (ii) formulate action plans for GMS countries in establishing and strengthening biosafety policy and regulations to be carried out under the TA;
- (iii) review the biosafety policy and regulations of other countries ratifying the Cartagena Protocol based on the Biosafety Information Clearinghouse of the Convention on Biological Diversity, and also incorporate into the TA activities lessons and experiences of other countries that are applicable to GMS countries; and
- (iv) advise GMS governments on the resource requirements for effective implementation of the biosafety policy and regulations, and help identify possible sources of external financing for such activities.

C. Food Safety Specialists (international, 3 person-months; domestic, 9 person-months)

4. The specialists will

- (i) design and facilitate awareness-raising activities on current issues in food safety related to the use of advanced agricultural science and technology in GMS, including possible health risks of GMOs, inappropriate ingredients and residues in food, systems for food safety management, and the standards of Codex Alimentarius Commission (Codex);
- (ii) design and facilitate technical training programs on methods, techniques, and traceability for improved detection of GMOs and analysis of harmful substances in food, considering the different food safety management systems among GMS countries;
- (iii) select appropriate food laboratory facilities in GMS countries to be used for technical training programs under the TA;
- (iv) plan a series of food laboratory experiments, which can be adequately incorporated into the awareness-raising and training programs organized under the TA; and
- (v) help prepare appropriate materials for awareness-raising activities and technical training programs, and recommend useful reference laboratory manuals to be used by GMS participants on their return to their home countries.

D. Information and Monitoring Systems Specialists (international, 3 person-months; domestic, 9 person-months)

5. The specialists will

- (i) assess GMS national information and monitoring systems for agricultural biotechnology and related food safety issues, including the available financial and human resources;
- (ii) provide necessary technical and advisory support for strengthening and institutionalizing these systems to improve general access to accurate knowledge and scientific information on the subject;

- (iii) examine the possibilities of direct linkages with relevant international and regional information networks and databases, including the Biosafety Information Clearinghouse of the Convention on Biological Diversity;
- (iv) help identify appropriate items of information and specific indicators to be incorporated in the national information and monitoring systems; and
- (v) help make necessary arrangements for the use of media and computer services for awareness-raising activities for a wider audience.

E. Environment Specialist (domestic, 4 person-months)

6. The specialist will

- (i) review the environmental aspects and issues relating to the use of advanced agricultural science and technology in GMS countries, including the policy and regulatory framework for improved biosafety to implement the Cartagena Protocol of Biosafety, and other relevant national systems for sound environmental management;
- (ii) help design materials for the awareness-raising and technical training programs, incorporating relevant information on the environmental regulations and requirements of GMS countries in relation to the use of advanced agricultural science and technology and the related food safety standards;
- (iii) help strengthen the programs and activities of the TA in addressing environmental concerns in line with ADB's environmental policy approved in November 2002 and environmental assessment guidelines introduced in 2003; and
- (iv) provide necessary technical and advisory support for GMS governments to improve the environmental aspects when introducing advanced agricultural science and technology and the related food safety standards.

F. Social Analysis Specialist (domestic, 4 person-months)

7. The specialist will

- (i) review critical social concerns and issues in the use of advanced agricultural science and technology and the related food safety standards in GMS countries, including access of women, indigenous peoples, and poor farmers to improved technology, and advanced knowledge and information;
- (ii) ensure that important social features of GMS countries are adequately taken into consideration in the awareness-raising activities and technical training programs to be implemented under the TA, in view of ADB's social safeguard policies;
- (iii) ensure that adequately balanced gender participation is realized in TA activities, and examine possible measures to promote women's participation in the use of advanced agricultural science and technology; and
- (iv) provide support for GMS governments in improving social aspects when using advanced agricultural science and technology and applying related food safety standards.