



# Technical Assistance Report

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Project Number: 42037  
Capacity Development Technical Assistance (CDTA)  
June 2009

**Kingdom of Cambodia: Tonle Sap Technology  
Demonstrations for Productivity Enhancement**  
(Cofinanced by the Government of Finland and the Republic of  
Korea e-Asia and Knowledge Partnership Fund)

Asian Development Bank



## CURRENCY EQUIVALENTS

(as of 21 May 2009)

Currency Unit	–	riel/s (KR)
KR1.00	=	\$0.000241
\$1.00	=	KR4,141

## ABBREVIATIONS

ADB	–	Asian Development Bank
CeC	–	community-based e-center
ICT	–	information and communication technology
MAFF	–	Ministry of Agriculture, Forestry and Fisheries
M&E	–	monitoring and evaluation
NGO	–	nongovernment organization
NIDA	–	National Information Communications Technology Development Authority
PRC	–	People's Republic of China
TA	–	technical assistance
TASF	–	Technical Assistance Special Fund
TCC	–	TA coordinating committee
VIC	–	village information center

## TECHNICAL ASSISTANCE CLASSIFICATION

<b>Type</b>	–	Capacity development technical assistance (CDTA)
<b>Targeting classification</b>	–	General intervention
<b>Sector (subsector)</b>	–	Agriculture and natural resources (agriculture and rural sector development, fishery, forestry, livestock, information and communication technology)
<b>Theme (subtheme)</b>	–	Economic growth (knowledge, science, and technological capacities)
<b>Location impact</b>	–	Rural and regional (high)
<b>Partnerships</b>	–	Government of Finland Republic of Korea e-Asia and Knowledge Partnership Fund

## NOTES

- (i) The fiscal year (FY) of the Government and its agencies ends on 31 December. FY before a calendar year denotes the year in which the fiscal year ends, e.g., FY2009 ends on 31 December 2009.
- (ii) In this report, "\$" refers to US dollars.

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## I. INTRODUCTION

1. During fact-finding for the project preparatory technical assistance to prepare the Tonle Sap Poverty Reduction and Smallholder Development Project (the Project), the Government of Cambodia requested the Asian Development Bank (ADB) to provide complementary capacity development technical assistance (TA) for technology demonstrations and information and communication technology (ICT) application for accelerated growth and diversification of agricultural production and improved access to markets. The ADB TA fact-finding mission visited Cambodia from 25 February to 7 March 2008, and discussed the proposed TA for Tonle Sap Technology Demonstrations for Productivity Enhancement. The TA is included in ADB's 2009 assistance program for Cambodia.<sup>1</sup> The TA design and monitoring framework is in Appendix 1.

## II. ISSUES

2. Agriculture is one of the most important economic sectors in Cambodia. The sector contributed 30% to the country's gross domestic product (GDP) in 2008 and grew at an average rate of 7.7% per annum during 2005–2008. Although the sector's share in GDP has declined from an average of 38% over the past 4 years and the annual growth rate declined from 15.7% in 2005 to 5.0% in 2008, agriculture remains the primary source of employment and income for the vast majority of the rural population, which makes up about 85% of the country's population. The sector is particularly significant for the Tonle Sap Basin, which is home to one-third of the country's population and covers 42% of the land area in Cambodia.

3. In the mid-1990s, the Government started to reform the agriculture sector, when the country was transitioning from a centrally planned to a market economy. The sector's important role in the national economy was enshrined in the Government's Rectangular Strategy<sup>2</sup> that emphasizes (i) enhancement of the agricultural sector, covering improved productivity and diversification of agriculture, land reform and clearing of mines, fisheries reform, and forestry reform; together with (ii) continued rehabilitation and construction of physical infrastructure; (iii) private sector growth and employment; and (iv) capacity building and human resource development. Sustainable agriculture and rural sector development has been at the core of poverty reduction and economic growth in Cambodia and is in line with ADB's long-term strategic framework 2008–2020 (Strategy 2020<sup>3</sup>) and Operation Plan for Agriculture and Rural Development under Strategy 2020<sup>4</sup>, which support inclusive economic growth and environmentally sustainable growth.

4. The reforms have, so far, helped Cambodia to achieve food self-sufficiency, price liberalization, and an improved land law. The ongoing agriculture sector reform and development aim at promoting sustainable growth of market-based agriculture, improving agricultural productivity, and divesting state-owned enterprises in the sector. However, the agriculture sector is still lagging behind because of interlinked binding constraints: (i) lack of secure and clear property rights (land titles, rule of law, and policy transparency); (ii) limited access to good practices in agricultural production, markets, and timely and relevant information; and (iii) absence of proper irrigation and extension services. To intensify the agriculture sector, these constraints must be addressed in the medium and long term.

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<sup>1</sup> The TA first appeared in the business opportunities section of ADB's website on 17 March 2008.

<sup>2</sup> Government of Cambodia. 2004. *The Rectangular Strategy for Growth, Employment, Equity and Efficiency in Cambodia*. Phnom Penh (revised in 2008 by the Supreme National Economic Council).

<sup>3</sup> ADB. 2008. *Strategy 2020: The Long-Term Strategic Framework of the Asian Development Bank, 2008–2020*. Manila.

<sup>4</sup> ADB. 2008. *Operational Plan for Agriculture and Rural Development under Strategy 2020*. Manila.

5. The TA addresses constraints in accessing good practices in agricultural production, markets, and information. Traditional farming and production are carried out at the household level because of limited access to good practices in agricultural production, markets, as well as timely and relevant information that provide a useful incentive for investment. Together with the Government's initiatives to enhance agricultural productivity from various perspectives, as enshrined in the Rectangular Strategy, improving access of rural households to production technologies and increasing access to information on technology, markets, socioeconomic, health, and environmental concerns through application of rural ICT will contribute to unleash the potential of smallholders and marginal farmers. In addition, these will help optimize economic and financial benefits of current and future investment originating from both the public and private sectors, including rural households.

6. **Limited Access of Rural Households to Production Technologies.** A significant part of the rural poverty is caused by low agricultural productivity. This is being reinforced by the recent soaring food, energy, and input prices that have further reduced the viability of the smallholder and marginal farmers who are also net food buyers.<sup>5</sup> Rural households continue to use low levels of production and processing technology that are familiar to them. Rural households' links with markets are weak. Farmers' knowledge of diversified farming technologies is also limited. The Cambodia Agricultural Research and Development Institute; the Ministry of Agriculture, Forestry and Fisheries (MAFF); and nongovernment organizations (NGOs) and several other public and private organizations are the main source of rural technologies. Weak capacity and lack of resources have hindered the dissemination of many new technologies, so rural areas have not kept pace with the changing demand and market environment. Farmers' limited and poor knowledge, in the absence of modern means of accessing information such as ICT, has hindered agricultural and rural growth and the advancement of Cambodian farmers compared with most of the neighboring countries. The need to accelerate technology adoption is urgent to improve production and post-harvest management, covering new seed technology, cropping patterns, land and soil fertility management, water management, pesticide and fertilizer management, and product processing and marketing.

7. **Lack of Access to Rural ICT.** Best practices in rural ICT development and application—in countries such as the People's Republic of China (PRC), India, Malaysia, Viet Nam, and elsewhere in the world—have documented that improved access to ICT has been an important tool to alleviate poverty, especially for rural areas, where a very small percentage of the population can enjoy its services. Through the use of ICT services, rural communities can find new income-earning opportunities, improve the delivery of basic services, and enhance their participation in decision-making processes. Experiences in the PRC, Malaysia, and Viet Nam have indicated that application of rural ICT using the model of community-based e-centers (CeCs) has been extremely productive as public-access facilities providing electronic communication services, especially in marginalized or remote areas where ICT is not prevalent. They serve as avenues for providing universal access communications and multimedia services to rural communities since they provide access to telephones, faxes, computers, the internet, photocopiers, and other equipment and services.

8. Access of Cambodian farmers and rural people to information is essential to benefit from knowledge-intensive production, processing, and marketing systems; and to improve their competitive advantage. By accessing timely and quality information, the entire production process could be planned better based on market demand, thereby minimizing the risk of market failures. Effectively, the total cost of production could be minimized and competitive advantage achieved.

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<sup>5</sup> ADB. 2008. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Asian Development Fund Grant to the Kingdom of Cambodia for the Emergency Food Assistance Project*. Manila.

Development of rural ICT networks and support for rural people's access to ICT will, however, require involvement by a number of agencies, including NGOs and the private sector. The National Information Communications Technology Development Authority (NIDA), established in August 2000, coordinates ICT policy development and application. Mobile phone and internet access have shown impressive growth, although most ICT infrastructure is concentrated around the capital city of Phnom Penh; the provinces of Battambang, Kratie, and Kampong Cham; and rural areas along the Thailand and Viet Nam borders. The Government recognizes the importance and the need to support rural Cambodia access to ICT. The private sector and other development partners have pilot tested various initiatives to bridge the rural–urban digital divide. The Ministry of Post and Telecommunications is implementing a World Bank-supported pilot ICT project to bring voice telephone services to low-income families in remote areas of Banteay Meanchay, Odor Meanchay, and Preah Vihear provinces. All of these are expected to provide valuable learning experiences. However, productive use of ICT in rural Cambodia can only happen when (i) availability and access to digital technologies and voice and data communication infrastructure are ensured; (ii) information contents are enhanced; and (iii) training, mobilization, and awareness building are implemented through sound and viable partnerships among the public sector, private sector, and communities.

### III. THE PROPOSED TECHNICAL ASSISTANCE

#### A. Impact and Outcome

9. The main impact of the TA is diversified and improved income of smallholders, marginal farmers, and poor households in the Tonle Sap Basin. The expected outcome of the TA will be increased access of smallholders, marginal farmers, and poor households to good agricultural practices, technologies, and information.

#### B. Methodology and Key Activities

10. The TA is expected to produce two main outputs: (i) good agricultural practices and technologies demonstrated and training provided; and (ii) physical rural ICT facilities established for pilot testing. The TA covers four provinces—Banteay Meanchay, Kampong Cham, Kampong Thom, and Siem Reap—since they play a significant role in economic development of the Tonle Sap Basin and the national economy. The upcoming Project<sup>6</sup> will target these same provinces in its community interventions to improve rural livelihoods in the Tonle Sap Basin. Operational and economic synergies, therefore, provide a strong rationale for the TA to cover the same provinces as the Project. In operational terms, the TA will put technologies in place for replication and scaling up under the Project. Detailed TA activities and criteria for selection of demonstration sites are in Supplementary Appendix A.

11. **Output 1: Good Agricultural Practices and Technologies Demonstrated and Training Provided.** The TA will support demonstrations and training of good practices and technologies in agricultural production for (i) selected food crops, including long bean, mung bean, and tomato; (ii) energy crops (Jatropha); (iii) selected livestock, including cattle, buffalo, pigs, and poultry; (iv) selected fisheries, including rice fish together with pond aquaculture of tilapia, silver carp, common carp, and a small endogenous nutritive species; and (v) water management technologies (e.g., for farmer-owned and managed small-scale irrigation scheme).

12. **Output 2: Physical Rural ICT Facilities Established for Pilot Testing.** The TA will support pilot application of ICT in rural areas by establishing physical facilities, including e-kiosks

<sup>6</sup> The Project will be submitted for consideration by ADB's Board of Directors in the third quarter of 2009.

and CeCs and/or village information centers (VICs) with connectivity and content in selected communes.

13. The TA support to rural ICT application will complement the first output, and facilitate access to updated information and technologies—including updates on new varieties; techniques on crops, livestock, and aquaculture; disease outbreaks and prevention; and other socioeconomic, health, and environmental concerns. Moreover, the TA support to rural ICT application will promote universal access to communications and multimedia services for rural communities, and trigger the development of the rural ICT market in the medium and long term. At the full-fledged development stage, physical facilities such as community e-kiosks, CeCs, and/or VICs will serve as virtual roads or communication highways that can benefit the rural communities as a whole.

14. The TA will develop and pilot test innovative approaches to public, private, and community partnerships in agricultural technologies and rural ICT development, with potential for replication and scaling up.<sup>7</sup> The TA will review and incorporate lessons learnt from past and ongoing ADB assistance, including the Agriculture Sector Development Program<sup>8</sup> to ensure appropriate selection of technologies and their sustainability. The TA will also support monitoring and evaluation (M&E) activities covering (i) collection of baseline data on performance indicators and their monitoring; (ii) documentation of lessons during TA implementation; and (iii) an impact evaluation survey at the end of the TA. The executing agency is responsible for the M&E activities and will ensure the M&E results provide relevant lessons and experiences for replication and scaling up. The executing agency will also ensure that the M&E results complement design and implementation of the (i) subprojects under the Project; (ii) regional TA on Rural ICT Policy Advocacy, Knowledge Sharing, and Capacity Building;<sup>9</sup> (iii) other projects in the ADB pipeline; and (iv) subsequent dissemination in other provinces. The TA will seek complementary assistance and alliance with NGOs and private sector entities, especially in the rural ICT development and bioenergy (Jathropa) technology demonstration.

### **C. Cost and Financing**

15. The TA is estimated to cost an equivalent of \$3,650,000, of which \$250,000 equivalent will be financed on a grant basis by ADB's TA funding program (TASF-IV). The TA will be cofinanced on a grant basis by the Government of Finland<sup>10</sup> (\$2,700,000 equivalent) and the Republic of Korea e-Asia and Knowledge Partnership Fund (\$500,000 equivalent), and administered by ADB. The Government of Cambodia will provide in-kind contribution of \$200,000 through provision of office accommodations, counterpart staff support, facilities for meetings, and part of local transport costs. The cost estimates and financing plan are in Appendix 2.

### **D. Implementation Arrangements**

16. The TA will be implemented over 36 months from September 2009 to August 2012. The MAFF, the executing agency, will be responsible for overall coordination, reporting of the TA and implementation of Output 1. NIDA will be the implementing agency for Output 2. An interagency TA coordinating committee (TCC), chaired by a designated MAFF secretary of state, will be established and will convene quarterly to provide overall policy guidance on the TA

<sup>7</sup> A number of private ICT companies have shown interest in participating in the Government's effort to develop rural ICT services.

<sup>8</sup> ADB. 2003. *Report and Recommendation of the President to the Board of Directors on Proposed Loans and Technical Assistance Grant to Cambodia for the Agriculture Sector Development Program*. Manila.

<sup>9</sup> ADB. 2008. *Technical Assistance for Rural Information and Communication Technology Policy Advocacy, Knowledge Sharing, and Capacity Building*. Manila.

<sup>10</sup> Through the Channel Financing Agreement (Technical Assistance Program) between the Government of Finland and the Asian Development Bank.

implementation. A national TA coordinator assigned by MAFF will coordinate implementation of the entire TA. Technical staff from MAFF will implement technology demonstration activities, including selection of sites and types of demonstrations. Technical staff from NIDA will implement rural ICT activities, including selection of sites and modalities of rural ICT pilots. The TA implementation diagram is in Appendix 3.

17. The TA will develop the capacity of MAFF and NIDA to replicate the demonstrated technologies during and after TA completion. To ensure the ownership of MAFF and NIDA over demonstrated technologies, technical staff from MAFF and NIDA will be engaged on a full-time basis for the entire TA implementation period. It is estimated that the TA will require 864 person-months of technical staff inputs, including 432 person-months for technology demonstrations and 432 person-months for rural ICT application. Outline terms of reference for technical staff are in Appendix 4 and details are in Supplementary Appendix B.

18. The TA will require 137 person-months of consulting services, including 45 person-months of international and 92 person-months of national consultants to assist MAFF and NIDA in conducting technology demonstrations and piloting rural ICT application. For technology demonstrations, required expertise will include (i) a technology transfer and extension expert, (ii) a biofuel development expert, and (iii) a social development and institutional specialist. The international technology transfer and extension expert will assume the role of the team leader, and the national technology transfer and extension expert will be the national deputy team leader for the TA. For rural ICT application, required expertise will include (i) an ICT planning and evaluation expert; (ii) an ICT business development expert; (iii) an ICT engineering and design expert; and (iv) an ICT web developer, content management, and training specialist. The international ICT planning and evaluation expert will supervise the rural ICT application activities. Outline terms of reference for consulting services are in Appendix 4 and details are in Supplementary Appendix C.

19. One or more international consulting firms will be engaged using the quality- and cost-based selection method (quality–cost ratio 80:20 with a simplified technical proposal) to provide the consulting expertise for the TA. The consultants will be engaged by ADB in accordance with its *Guidelines on the Use of Consultants* (2007, as amended from time to time). All equipment and training services will be procured in accordance with ADB's *Procurement Guidelines* (2007, as amended from time to time). Equipment procured under the TA will be handed over to the Government upon TA completion. Disbursements under the TA will be done in accordance with ADB's *Technical Assistance Disbursement Handbook*.<sup>11</sup>

#### IV. THE PRESIDENT'S RECOMMENDATION AND DECISION

20. The President recommends that the Board approve ADB administering a portion of technical assistance not exceeding the equivalent of \$2,700,000 to the Government of Cambodia for the Tonle Sap Technology Demonstrations for Productivity Enhancement, to be financed on a grant basis by the Government of Finland. If the Board approves ADB administering the technical assistance, the President, acting under the authority delegated by the Board, will approve (i) ADB administering a portion of technical assistance not exceeding the equivalent of \$500,000 to be financed on a grant basis by the Republic of Korea e-Asia and Knowledge Partnership Fund, and (ii) ADB providing the balance not exceeding the equivalent of \$250,000 on a grant basis, to the Government of Cambodia for the Tonle Sap Technology Demonstrations for Productivity Enhancement.

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<sup>11</sup> ADB. 2008. *Technical Assistance Disbursement Handbook*. Manila.

### DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets/Indicators	Data Sources/Reporting Mechanisms	Assumptions and Risks
<p><b>Impact</b></p> <p>Income of smallholders, marginal farmers, and poor households in the Tonle Sap Basin diversified and improved</p>	<p>Contribution to increase average farm household income in the four provinces from an estimated \$380 per annum in 2008 to \$480 per annum by December 2015</p>	<p>Official national income statistics classified by province</p> <p>Baseline surveys and impact assessment surveys for the four provinces by MAFF and NIDA</p>	<p><b>Assumptions</b></p> <p>No major political, economic or natural disaster shocks during and after TA implementation</p> <p>Government and development partners' commitment to implement follow-on investment projects remain firm</p> <p><b>Risks</b></p> <p>Slowdown in policy and institutional reforms</p> <p>Slow progress in implementation of complementary projects, especially in development of rural livelihoods and rural ICT</p>
<p><b>Outcome</b></p> <p>Increased access of smallholders, marginal farmers, and poor households in the Tonle Sap Basin to good agricultural practices, technologies, and information</p>	<p>The number of farm households in the four provinces adopting good agricultural practices and technologies increases from 0% in 2008 to 10% by August 2012</p>	<p>Baseline surveys and impact assessment surveys by MAFF and NIDA</p> <p>Reports of all demonstrated good agricultural practices and technologies in the field</p> <p>Reports of all piloted rural ICT models in the field</p> <p>TA progress reports by MAFF and NIDA</p>	<p><b>Assumption</b></p> <p>Minimum required market and transport infrastructure are in place to encourage farm households to adopt good agricultural practices and technologies</p> <p><b>Risks</b></p> <p>Farm households resist changes and continue to favor traditional production methods</p> <p>Rural ICT models are not financially sustainable</p>
<p><b>Outputs</b></p> <p>1. Good agricultural practices and technologies demonstrated and training provided</p>	<p>Development and approval of selection criteria for at least five models of each crop (food and biofuel), livestock, and fishery technologies by November 2009</p> <p>At least five models of each crop (food and biofuel), livestock, and fishery technologies are designed, demonstrated, and trained in the four provinces by January 2011</p> <p>Profiles of at least five models of each crop (food and biofuel), livestock, and fishery technologies and associated soil and land maps</p>	<p>Baseline surveys and impact assessment surveys by MAFF and NIDA</p> <p>TA progress reports by MAFF and NIDA</p> <p>Reports of all demonstrated good agricultural practices and technologies in the field</p> <p>Interviews with key informants, farmer representatives, and focus</p>	<p><b>Assumption</b></p> <p>Strong support and cooperation of the subnational authorities (e.g., provincial, district, and commune councils)</p> <p><b>Risk</b></p> <p>Input price shocks discourage farm households from adopting demonstrated good agricultural practices and technologies</p>

Design Summary	Performance Targets/Indicators	Data Sources/Reporting Mechanisms	Assumptions and Risks
	<p>are prepared and disseminated by January 2011</p> <p>Two farmer-designed small-scale irrigation schemes are developed, constructed, managed and operationalized by January 2011</p> <p>At least 60 staff from MAFF, NIDA, and relevant national agencies, and 160 staff from provincial, district agencies, and commune councils, are trained to master technical demonstrations and replication management by July 2011</p> <p>At least 400 farmers of demonstration sites (communes) are trained to use and replicate demonstrated technologies by July 2011</p>	group discussions	
<p>2. Physical rural ICT facilities established for pilot testing</p>	<p>A total of 20 e-kiosks or VICs are established in selected communes, and at least three operated exclusively by women for women and one by an ethnic minority for their group by July 2011</p> <p>Rural ICT contents are developed and installed in all 20 e-kiosks or VICs with information on agricultural production technologies and markets by July 2011</p> <p>At least 60 staff from NIDA, MPTC, MAFF, and relevant national agencies, and 120 staff from provincial, district agencies, and commune councils are trained to understand rural ICT application, development, management, and promotion of piloted ICT models by July 2011</p> <p>At least 10 people in each pilot commune are trained in management and use of ICT application by July 2011</p>	<p>Baseline surveys and impact assessment surveys by MAFF and NIDA</p> <p>TA progress reports by MAFF and NIDA</p> <p>Reports of all pilot tested rural ICT models in the field</p> <p>Interviews with key informants, farmer representatives, and focus group discussions</p>	<p><b>Assumption</b></p> <p>Ministry of Posts and Telecommunications—in collaboration with other public, private, and civil society organizations—ensures fiber optic and/or wireless broadband connectivity of e-kiosks or VICs with signals, and appropriate frequency</p> <p><b>Risks</b></p> <p>Lack of interest from the private sector in development of rural ICT</p> <p>Power supply problems undercut ICT implementation</p>
<p><b>Activities with Milestones</b></p> <p><b>1. Technology Demonstrations</b></p> <p>1.1. Preparation of an implementation plan for technology demonstrations and training by October 2009.</p> <p>1.2. Preparation of complete soil and land zoning maps for selected areas by January 2010.</p>			<p><b>Inputs</b></p> <p><b>Total Costs: \$3,650,000</b></p> <p><b>A. ADB Financing</b></p> <p>Equipment: \$60,000</p>

<p>1.3. Establishment of baseline data and impact indicators for pilot technologies by January 2010.</p> <p>1.4. Development of selection criteria and selection mechanism for the choice of location for pilot technology demonstration by January 2010.</p> <p>1.5. Development of selection criteria and selection mechanism for the choice of pilot technologies for demonstration by January 2010.</p> <p>1.6. Selection of location and technologies for pilot demonstration by January 2010.</p> <p>1.7. Pilot testing and demonstration of selected crops, livestock, fisheries, and small-scale water management technologies in selected locations by January 2011.</p> <p>1.8. Compilation of information and communication materials on successful technologies (user manuals, messages, and other forms) for dissemination to farmers in Tonle Sap Basin area by July 2011.</p> <p>1.9. Development of a replication strategy in connection with the Project by January 2011.</p> <p>1.10. Replication and transfer of the demonstrated technologies to the Project by June 2012.</p>	<p>Miscellaneous Administrative Support Costs: \$160,000 Contingencies: \$30,000 <b>Subtotal (A): \$250,000</b></p> <p><b>B. Government of Finland Financing</b> Consultants: \$1,240,000 Equipment: \$60,000 Training, Workshops, Seminars and Conferences: \$750,000 Miscellaneous Administrative Support Costs: \$388,800 Contingencies: \$261,200 <b>Subtotal (B): \$2,700,000</b></p>
<p><b>2. Rural ICT Application</b></p> <p>2.1. Assessment of capacity of agricultural institutions to modernize service delivery through use of ICT, including assessment of private sector role by January 2010.</p> <p>2.2. Establishment of baseline status of rural ICT application and impact indicators by January 2010.</p> <p>2.3. Identification and finalization of public, private, and NGO partners in implementation of rural ICT application by September 2009.</p> <p>2.4. Development of selection criteria and selection mechanisms for the choice of location of e-kiosks, CeCs, and/or VICs by January 2010.</p> <p>2.5. Selection of location of e-kiosks, CeCs, or VICs, and conduct of feasibility studies in the identified sites through focus group and stakeholder meetings, and community need assessment workshops by January 2010.</p> <p>2.6. Selection of modules (structure, equipment, materials, and skills) for e-kiosks, CeCs, or VICs by January 2010.s</p> <p>2.7. Development of ownership, operation, management, and business model for e-kiosks, CeCs, or VICs by April 2010.</p> <p>2.8. Establishment of networking infrastructure and establishing e-kiosks, CeCs, or VICs by July 2010.</p> <p>2.9. Selection of candidates for rural e-development groups, and development and implementation of training program for e-development groups and users (including women and ethnic minorities) in phases by June 2012.</p> <p>2.10. Development and implementation of a plan for operating e-kiosks, CeCs, or VICs by January 2011.</p> <p>2.11. Assessment, selection, and establishment of broadband fiber optics and/or wireless network connectivity, web design, content development, and training by July 2010.</p> <p>2.12. Development of a replication strategy in connection with the Project by January 2011.</p> <p>2.13. Replication and transfer of the piloted rural ICT models to the Project by June 2012.</p>	<p><b>C. Republic of Korea e-Asia and Knowledge Partnership Fund</b> Equipment: \$60,000 Training, Workshops, Seminars and Conferences: \$260,000 Surveys: \$130,000 Contingencies: \$50,000 <b>Subtotal (C): \$500,000</b></p> <p><b>D. Government of Cambodia Financing (in kind)</b> Office Accommodation and Transport: \$70,000 Remuneration and Per Diem of Counterpart Staff: \$80,000 Others: \$50,000 <b>Subtotal (D): \$200,000</b></p>

ADB = Asian Development Bank; CeC = community-based e-center, ICT = information and communication technology; MAFF = Ministry of Agriculture, Forestry and Fisheries; MTPC = Ministry of Posts and Telecommunications; NGO = nongovernment organization; NIDA = National Information Communications Technology Development Authority; TA = technical assistance; VIC = village information center.

## COST ESTIMATES AND FINANCING PLAN

(\$'000)

Items	Total
<b>A. Asian Development Bank (ADB) Financing<sup>a</sup></b>	
1. Equipment <sup>b</sup>	60.0
2. Miscellaneous Administrative Support Costs <sup>c</sup>	160.0
3. Contingencies	30.0
<b>Subtotal (A)</b>	<b>250.0</b>
<b>B. Government of Finland Financing<sup>d</sup></b>	
1. Consultants	
a. Remuneration and Per Diem <sup>e</sup>	1,040.0
(i) International Consultants	810.0
(ii) National Consultants	230.0
b. International and Local Travel	150.0
c. Reports and Communications	50.0
2. Equipment <sup>f</sup>	60.0
3. Training, Workshops, Seminars and Conferences <sup>g</sup>	750.0
4. Miscellaneous Administrative Support Costs <sup>h</sup>	388.8
5. Contingencies	261.2
<b>Subtotal (B)</b>	<b>2,700.0</b>
<b>C. Republic of Korea e-Asia and Knowledge Partnership Fund<sup>i</sup></b>	
1. Equipment <sup>j</sup>	60.0
2. Training, Workshops, Seminars and Conferences <sup>k</sup>	260.0
3. Surveys <sup>l</sup>	130.0
4. Contingencies	50.0
<b>Subtotal (C)</b>	<b>500.0</b>
<b>D. Government of Cambodia Financing (in-kind)</b>	
1. Office Accommodation and Transport	70.0
2. Remuneration and Per Diem of Counterpart Staff	80.0
3. Others	50.0
<b>Subtotal (D)</b>	<b>200.0</b>
<b>Total (A+B+C+D)</b>	<b>3,650.0</b>

<sup>a</sup> Financed by ADB's TASF-IV funding source.

<sup>b</sup> Equipment and office supply for TA implementation (including computers and printers): \$30,000 for technology demonstrations and \$30,000 for rural information and communication technology (ICT) application.

<sup>c</sup> Includes office operation, translation costs, and equipment maintenance costs: \$80,000 for technology demonstrations and \$80,000 for rural ICT application.

<sup>d</sup> Through the Channel Financing Agreement (Technical Assistance Program) between the Government of Finland and the Asian Development Bank, and administered by ADB.

<sup>e</sup> Includes \$557,000 for technology demonstrations and \$483,000 for rural ICT application.

<sup>f</sup> Covers cost of equipment for technology demonstrations.

<sup>g</sup> Includes (i) training costs of \$45,000 for technology demonstrations and \$45,000 for rural ICT application; (ii) input for technology demonstration: \$110,000 for biofuel demonstration, \$90,000 for selected crops, \$90,000 for fisheries, \$90,000 for livestock, and \$80,000 for water management technologies; (iii) \$100,000 for training modules for e-agriculture targeting National Information Communications Technology Development Authority (NIDA), Ministry of Agriculture, Forestry and Fisheries (MAFF), and other subnational agencies; and (iv) \$100,000 for content development support.

<sup>h</sup> Covers salary supplements and allowance for seconded technical staff from MAFF and NIDA (\$194,400 for technology demonstrations and \$194,400 for rural ICT application).

<sup>i</sup> Administered by ADB.

<sup>j</sup> Covers equipment for pilot application of rural ICT.

<sup>k</sup> Covers cost of inputs for pilot application of rural ICT.

<sup>l</sup> Covers (i) \$90,000 for baseline and impact evaluation surveys (\$45,000 for technology demonstrations and \$45,000 for rural ICT application); and (ii) \$40,000 for institutional assessments of agricultural institutions to modernize service delivery.

Source: Asian Development Bank estimates.



## OUTLINE TERMS OF REFERENCE

### A. Technical Staff from MAFF and NIDA

#### 1. General Requirements

1. The technical assistance (TA) will develop the capacity of the Ministry of Agriculture, Forestry and Fisheries (MAFF) and the National Information Communications Technology Development Authority (NIDA) to replicate the demonstrated technologies during and after the TA. To ensure the technologies are transferred to the respective ministries, the TA will engage technical staff from relevant departments and offices of MAFF and NIDA on a full-time basis for the entire period of TA implementation. One of the agronomists will assume the role of the national TA coordinator. It is estimated that the TA will need to mobilize 864 person-months of technical staff inputs, including 432 person-months for technology demonstrations, and 432 person-months for rural information and communication technology (ICT) application. The schedule of technical staff expertise is in Table A4.1. The TA will support remuneration supplements for engagement of the technical staff based on the Government's prevailing regulations. The staff should have (i) a bachelor's degree or equivalent qualification; (ii) worked for respective agencies (MAFF and NIDA) for at least 5 years; (iii) extensive knowledge and experience in the relevant fields; (iv) experience in working and interacting with government institutions, donor organizations, and international consultants; and (v) be fluent in written and spoken English. Besides the above qualifications, staff appointments will be conditional upon (i) commitment to work for the respective agencies (MAFF and NIDA) for at least 3 years after TA completion; and (ii) willingness to sign binding agreements with respective agencies (MAFF and NIDA) to reflect such commitments. Copies of such binding agreements must be sent to the Asian Development Bank (ADB) for concurrence. Outline terms of reference are presented below and details are in Supplementary Appendix B.

**Table A4.1: Schedule of Technical Staff Expertise**  
(person-months)

Expertise	No. of Staff	Person-Month	Total
<b>Technology Demonstrations</b>	<b>12</b>	<b>144</b>	<b>432</b>
1. Agronomist <sup>a</sup>	3	36	108
2. Livestock Expert	3	36	108
3. Aquaculture Expert	3	36	108
4. Participatory Irrigation and On-Farm Water Management Expert	3	36	108
<b>Rural ICT Application</b>	<b>12</b>	<b>144</b>	<b>432</b>
5. ICT Planning and Evaluation Expert	3	36	108
6. ICT Business Development Expert	3	36	108
7. ICT Engineering and Design Expert	3	36	108
8. ICT Web Developer, Content Management, and Training Expert	3	36	108
<b>Total</b>			<b>864</b>

ICT = information and communication technology.

<sup>a</sup> One agronomist will be the national coordinator for the whole TA.

Source: Asian Development Bank estimates.

#### 2. Duties and Responsibilities for Technical Staff Experts

##### a. Technology Demonstrations

2. **Agronomists** (3 persons, 36 person-months each). Under the supervision of the national TA coordinator and in cooperation with the TA consultant team, the agronomists will

plan, implement, and lead the pilot crop technology demonstration subprojects. Among others, the staff experts will (i) undertake a rapid assessment of the crop sector in selected provinces; (ii) carry out in-depth analysis of land and water resources in selected provinces; (iii) review farming systems in selected provinces; (iv) develop selection criteria and selection mechanisms for the choice of pilot crop technologies for demonstration; (v) select location and technologies for pilot crop demonstration; and (vi) supervise pilot testing and demonstration of selected crops technologies in specific locations.

3. **Livestock Experts** (3 persons, 36 person-months each). Under the supervision of the national TA coordinator and in cooperation with the TA consultant team, the livestock experts will plan, implement, and lead the pilot livestock technology demonstration subprojects.

4. **Aquaculture Experts** (3 persons, 36 person-months each). Under the supervision of the national TA coordinator and in cooperation with the TA consultant team, the aquaculture experts will plan, implement, and lead the pilot aquaculture technology demonstration subprojects.

5. **Participatory Irrigation and On-Farm Water Management Experts** (3 persons, 36 person-months each). Under the supervision of the national TA coordinator and in cooperation with the TA consultant team, the participatory irrigation and on-farm water management specialists will plan, implement, and lead the pilot participatory irrigation management demonstration subprojects.

#### b. Rural ICT Application

6. **ICT Planning and Evaluation Experts** (3 persons, 36 person-months each). Under the supervision of the national TA coordinator and in cooperation with the TA consultant team, the ICT planning and evaluation staff experts will get involved and take delivery of the work related to planning, designing, development, and evaluation of pilot ICT application in selected communes.

7. **Rural ICT Business Development Experts** (3 persons, 36 person-months each). Under the supervision of the national TA coordinator and in cooperation with the TA consultant team, the rural ICT business development staff experts will get involved and take delivery of the work related to rural ICT business development.

8. **Rural ICT Engineering and Design Experts** (3 persons, 36 person-months each). Under the supervision of the national TA coordinator and in cooperation with the TA consultant team, the rural ICT engineering and design staff experts will get involved and take delivery of the work related to the design, operation, and maintenance of the e-kiosks, CeCs, and VICs.

9. **Rural ICT Web Developer, Content Management, and Training Experts** (3 persons, 36 person-months each). Under the supervision of the national TA coordinator and in cooperation with the TA consultant team, the rural ICT web developer, content management, and training staff experts will get involved and take delivery of the work related to the local contents, e-applications, and mobile applications, including capacity and awareness building.

## B. Consulting Services

### 1. General Requirements

10. A total of 137 person-months of consulting services, comprising 45 person-months of international and 92 person-months of national consultants, will be required for the proposed TA. The international technology transfer and extension expert will assume the role of the team leader, and the national technology transfer and extension expert will be the national deputy team leader for the entire TA. The schedule of consultant expertise is in Table A4.2. The consultants should have adequate working experience in Southeast Asia, preferably in Cambodia. The international consultants should have (i) at least a master's degree or equivalent, and adequate relevant working experience in planning and implementing pilot demonstration projects; (ii) sound knowledge of and practical experience in relevant fields; and (iii) strong interpersonal and communication skills. The national consultants should have (i) a bachelor's degree or equivalent qualification; (ii) extensive knowledge and experience in the relevant fields in Cambodia; (iii) experience in working with government institutions and international consultants; and (iv) be fluent in written and spoken English. Outline terms of reference are presented below and details are in Supplementary Appendix C.

**Table A4.2: Schedule of Consultant Expertise**  
(person-months)

Expertise	International	National	Total
<b>Technology Demonstrations</b>	<b>24</b>	<b>50</b>	<b>74</b>
1. Technology Transfer and Extension Expert <sup>a</sup>	18	36	54
2. Biofuels Development Expert	6	6	12
3. Social Development and Institutional Specialist	0	8	8
<b>Rural ICT Application</b>	<b>21</b>	<b>42</b>	<b>63</b>
4. Information, Communication, and Technology (ICT) Planning and Evaluation Expert <sup>b</sup>	6	0	6
5. ICT Business Development Expert	3	6	9
6. ICT Engineering and Design Experts	6	0	6
7. ICT Web Developer, Content Management, and Training Specialist	6	36	42
<b>Total</b>	<b>45</b>	<b>92</b>	<b>137</b>

<sup>a</sup> International technology transfer and extension expert will be the team leader for the whole TA and national technology transfer and extension expert will be the national deputy team leader.

<sup>b</sup> Information, communication, and technology (ICT) planning and evaluation expert will supervise rural ICT application activities.

Source: Asian Development Bank estimates.

### 2. Duties and Responsibilities for Consultants

#### a. Technology Demonstrations

11. **Technology Transfer and Extension Expert** (team leader, international, 18 person-months; deputy team leader, national, 36 person-months). The international technology transfer and extension expert will assume the role of the team leader, and the national technology transfer and extension expert will be the national deputy team leader for the entire TA. The team leader, together with the deputy team leader, will coordinate all TA activities during TA implementation, including liaising with the executing agency and implementing agencies.

12. **Biofuel Development Expert** (international, 6 person-months; national 6 person-months). The international biofuel development expert together with MAFF technical staff and national consultants will be responsible for planning, designing, developing, and evaluating pilot biofuel (Jathropa) demonstrations in selected communes.

13. **Social Development and Institutional Specialist** (national, 8 person-months). The social development and institutional specialist will (i) lead the institutional assessments; and baseline surveys; and (ii) prepare and facilitate implementation of a gender action plan that cuts across policy, extension services, technology transfers, and training in crop technologies and ICT.

#### **b. Rural ICT Application**

14. **Rural ICT Planning and Evaluation Expert** (international, 8 person-months). The international ICT planning and evaluation expert will supervise the rural ICT application activities and report to the team leader. The international ICT planning and evaluation expert, together with NIDA technical staff and national consultants under rural ICT application, will be responsible for planning, designing, developing, and evaluating pilot ICT application in selected communes.

15. **Rural ICT Business Development Expert** (international, 3 person-months; national, 8 person-months). The international rural ICT business development expert, together with NIDA technical staff and national consultants under rural ICT application, will be responsible for rural ICT business development.

16. **Rural ICT Engineering and Design Expert** (international, 6 person-months). The international rural ICT engineering and design expert, together with NIDA technical staff and national consultants under rural ICT application, will (i) design e-kiosks, CeCs, and VICs; (ii) establish facilities with connectivity and content in selected communities; and (iii) train rural people to manage, operate, and use the ICT facilities.

17. **Rural ICT Web Developer, Content Management, and Training Specialist** (international, 6 person-months; national, 36 person-months). The international rural ICT web developer, content management, and training specialist, together with NIDA technical staff and national consultants under rural ICT, will be responsible for the development of local contents, e-applications, and mobile applications, including capacity and awareness building.