Technical Assistance Report

Project Number: 41596
November 2007

India: Deploying Innovative Information and Communications Technology for Supporting e-Governance in Assam

(Financed by the Republic of Korea e-Asia and Knowledge Partnership Fund)

Asian Development Bank

CURRENCY EQUIVALENTS
(As of 5 November 2007)

Currency Unit	–	Indian rupee/s (Re/Rs)
Re1.00	=	$0.0254
$1.00	=	Rs39.44

ABBREVIATIONS

ADB	–	Asian Development Bank
AMTRON	–	Assam Electronics Development Corporation Ltd.
ASWAN	–	Assam State-wide area network
EOI	–	expression of interest
GOA	–	State Government of Assam
ICT	–	information and communications technology
IGFMIS	–	integrated government financial management information system
PPP	–	public–private partnership
RFP	–	request for proposal
TA	–	technical assistance

TECHNICAL ASSISTANCE CLASSIFICATION

Targeting Classification	–	Targeted intervention
Sector	–	Law, economic management, and public policy
Subsector	–	Public finance and expenditure management
Themes	–	Governance, private sector development, and capacity development
Subthemes	–	Public governance, public-private partnerships, and institutional development

NOTES

(i) The fiscal year (FY) of the Government of India ends on 31 March. FY before a calendar year denotes the year in which the fiscal year ends, e.g., FY2008 ends on 31 March 2008.

(ii) In this report, “$” refers to US dollars.

Vice President	L. Jin, Operations 1
Director General	K. Senga, South Asia Department (SARD)
Director	A. Sharma, Governance, Finance, and Trade Division, SARD
Team leader	K. Shin, Economist (Financial Sector), SARD

I. INTRODUCTION

1. The State Government of Assam (GOA) has been promoting the use of information and communications technology (ICT) for implementing governance, fiscal and financial management reforms under an integrated management information system (MIS). However, one of the prerequisites of an integrated MIS is the availability of a reliable, robust and cost-effective network connecting all GOA offices and departments. The financial sustainability of a network for e-governance in Assam has been a major issue for the GOA, as the investment requires long payback because of high infrastructure costs and low rates of return. The GOA is therefore looking for a cost-efficient technology which can help establish the infrastructure for last-mile connectivity and expand the ICT network across Assam, despite the limited financial resources available.

2. The major components will include: (i) development of an investment plan to expand the ICT infrastructure for a wider e-governance network, and to improve ICT accessibility in remote rural areas; (ii) development of a broad regulatory and institutional framework, including capacity development plan which facilitates the expansion of ICT accessibility and provides the platform for implementing e-governance applications over the long-term; (iii) a feasibility study for a cost-efficient technology for expanding the Assam State Wide Area Network (ASWAN)[1] through provision of last-mile connectivity solution; and (iv) assistance to the GOA to enable it to implement a pilot project in designated areas based on findings of the feasibility study.

3. The Asian Development Bank (ADB) country strategy and program update for India, 2006–2008 included support for governance and public resource management reforms in the state of Assam.[2] A fact-finding mission visited Assam in July 2007 and reached an understanding with the GOA on the purpose and output of the TA and on its methodology, key activities, cost estimates, financing plan, implementation arrangements, and terms of reference. The TA framework is in Appendix 1.

II. ISSUES

A. Digital Divide in Assam

4. Although Assam is rich in natural resources, particularly petroleum, coal, and forests, and has good potential for agricultural development, its economic performance has lagged behind that of the rest of India.[3] The literacy rate of its 26.6 million people at 64.3% is considerably lower than the national average of 74.8%. About 35% of Assam's population (slightly higher than the national average) falls below the poverty line of Rs400 per capita per month. The state's remote location in the northeast of India, poor infrastructure, as well as an inability to limit crop damage from frequent floods, have contributed to its low economic growth.

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[1] A good communications network is the backbone of any e-governance initiative and efficient e-governance should have infrastructure in place for the citizens to access government websites for interaction and transactions. ASWAN, a project under the National e-Governance Plan, is being implemented in two phases to cover all designated 304 numbers of major points of presence to access government websites across Assam. Given the magnitude of the project, phased implementation is envisaged for a smooth roll-out of the various services to be provided by the proposed network. The work started in February 2007.

[2] ADB. 2005. *Country Strategy and Program Update: India 2006–2008*. Manila. The TA first appeared in *ADB Business Opportunities* on 30 August 2007.

[3] Government of Assam. *Economic Survey Assam (2004–2005), Report on the Twelfth Finance Commission (2005–2010)*.

5. Assam, which accounts for 2.6% of India's population, has only 500,000 landline telephone connections (1.26% of the national total) and about 3 million mobile connections (2.01% of the total). This also translates to low internet connectivity. For example, only 15% of 3,000 government-funded schools are connected to the internet. A low level of urbanization is often matched by a large digital divide and this is certainly the case in Assam. The 13% of the people living in urban areas account for 65% of landline and 83% of mobile telephone connections, the remainder being in the state's 26,247 villages. Government-funded schools in the cities are five times more likely to be connected to the internet than their rural counterparts—22% versus 4%. The wage earning potential of a rural resident is considerably lower than that of an urban worker, at least in part because of a lack of access to information on the internet. Most children in rural schools—Assam's next generation—face a similar disadvantage.

B. Background and Linkage to Country Strategy

6. Good governance requires that all systems, procedures and policies of governments be transparent, accountable and effective. For this to happen, it needs efficient interfaces to communicate with the public, and all citizens must have better access to information. India's Right to Information Act gives each citizen the power to demand information on any matter of public interest. E-governance is a very powerful tool for this purpose, and if used properly, it can also reduce costs, enhance revenues, and improve the delivery of all public services. The National e-Governance Plan (NeGP) for 2003–2007 seeks to lay the foundation and provide the impetus for long-term growth of e-governance in India. The plan seeks to create the right governance and institutional mechanisms, and set up the core infrastructure and policies to enhance a citizen-centric and business-centric environment for governance.

7. The Government of India's NeGP has proposed that all state governments take the lead in building a broad framework to expedite the implementation of mission mode projects (MMPs) covering agriculture, land records, transport, *Gram Panchayats*,[4] municipalities, registration, police and employment exchange, commercial taxes, health and family welfare, forest, and treasuries. However, neither e-governance nor e-commerce is possible without network infrastructure. Lack of cheap and easy access to the internet is particularly important in rural areas. Private sector internet service providers are confined largely to urban regions, where an infrastructure backbone already exists, there is a higher density of paying customers, and traditional technologies are profitable. Connecting remote and sparsely populated rural areas has not been attractive to the private sector, which believes that returns would not justify the large initial investment and requires longer payback period than more commercially viable investment projects.

8. Despite these obstacles, rural areas in Assam and throughout India need ICT to provide (i) information on markets, prices, and business opportunities in agribusiness; (ii) information on employment opportunities and entrepreneurship; (iii) delivery of formal and informal education and skills training; and (iv) e-governance public services. This availability of internet access and the consequent e-governance and e-commerce services would enhance the life of many in the rural area in Assam and allow them to tap finance, market information and services.

9. The GOA has promoted the use of ICT for governance, fiscal and financial management, and capacity development. It is modernizing its financial management system, enhancing governance, and strengthening transparency and accountability. The Assam Governance and

[4] It means e-governance initiative for rural development in a state government.

Public Resource Management (AGPRM) Project Loan[5] provides the foundation for developing and implementing an integrated government financial management information system (IGFMIS) across the GOA. A prerequisite of the IGFMIS is the establishment of a reliable, robust, and cost-effective network to connect all government departments and agencies and then to link the government to its constituents through the proposed MMPs.

10. The expansion of public sector e-governance and e-rural development projects in Assam face serious problems of financial sustainability. The GOA will need particularly large investments to provide last-mile connectivity between end-users and the ASWAN, a backbone network proposed under the NeGP to connect all districts and the provinces in Assam. The GOA is, therefore, eager to find cost-efficient technology options that can provide internet services to end-users at a low cost. Cost-efficient technologies, including broadband and wireless access networks, will be reviewed under the TA to assess what solution is the most appropriate approach for Assam to meet its e-governance and e-rural development needs.

III. THE TECHNICAL ASSISTANCE

A. Impact and Outcome

11. The impact of the TA will be to help the GOA to (i) reduce the digital divide by expanding the ASWAN for e-governance delivery in rural areas, improve ICT accessibility, and develop e-governance applications to be identified by the NeGP; (ii) improve the legal, regulatory, and institutional framework for e-governance, and ICT accessibility and expansion; and (iii) enhance institutional capacity and human resources for operating e-governance applications and managing ICT infrastructure.

B. Methodology and Key Activities

12. The TA will include the following outputs: (i) an investment plan for improving ICT accessibility in remote rural areas and for expanding ICT infrastructure for an e-governance network; (ii) a regulatory and institutional framework, including a human resource development plan to expand ICT accessibility and provide the platform for implementing e-governance applications; (iii) a feasibility study of cost efficient technology for last-mile connectivity in the expansion of the ASWAN; and (iv) a pilot project based on the results of the feasibility study.

13. **Component One: Development of an Investment Plan to Improve ICT Accessibility in Remote Rural Areas and to Expand ICT Infrastructure for Expanded e-Governance Network**. The TA will examine the deficiencies in the ICT sector that have prevented greater penetration of internet and telephone services in Assam. The GOA's initiatives to widen its e-governance network will also be assessed. The investment plan will include a business model for a sustainable network based on the kind of financial viability and profitability that would attract public–private partnership (PPP). The business strategy in this model will contain an indicative budget for the first 3 years, recommend the PPP approach, suggest potential PPP investors and prepare the PPP related documents. The TA will ensure that PPP plays a central part in building public sector ICT capability and in the management of this network over the long term.

[5] $25 million has been assigned for the Project Loan (2005–2009) under the AGPRM to build institutional capacity of the public financial management institutions and support implementation of an integrate government financial management information system.

14. **Component Two: Development of a Regulatory and Institutional Framework (including a Human Resource Development Plan) to Expand ICT Accessibility and Provide the Platform for Implementing e-Governance Applications Over the Long-Term**. The TA will assess the legal, regulatory, and institutional framework of e-governance and identify areas for improvement. It will assess what institutional and human capacity development programs are needed to improve ICT accessibility in remote rural areas and to expand the e-governance network and sustain the network over the long-term, and recommend a strategy to enhance the organizational and management capacity of the key GOA departments. To enhance assistance for PPP undertakings, it will propose capacity development for PPP cells in key ministries to complement ongoing assistance to PPP at state level, enhance knowledge transfer and public awareness of international best practices, and assist vendor development and design of a project development framework.

15. **Component Three: A Feasibility Study for Cost Efficient Technology for Expanding the ASWAN Network through the Provision of Last-Mile Connectivity**. The TA will prepare a broad framework for implementing a robust, reliable, and cost efficient technology option for last-mile internet connectivity within the ASWAN. It will review the feasibility of adopting this low-cost technology in the designated urban and rural areas of Assam. Based on Assam's geographic, demographic, and business demand, the study will advise the GOA on the most appropriate site for testing the technology in the initial pilot project and a later expansion plan. The TA will also conduct a comprehensive study of the existing technology, which will be taken into consideration in the deployment of the innovative and cost efficient technology. Other related conditions for effective and efficient network design and technology will be addressed in the feasibility study.

16. **Component Four: Assisting the GOA to Implement a Pilot Project in Designated Areas Based on Findings of the Feasibility Study**. Based on the feasibility study for low cost technology, the TA will identify pilot sites equipped with computers, modems, and other facilities to demonstrate the benefits and feasibility of the suggested last-mile internet connectivity option. The pilot project will include three typical user groups—commercial, residential, and government. The last-mile connectivity technology will need to be: (i) cost-effective; (ii) easy for end-users to install, maintain, and access; (iii) flexible and scalable so that the network can be readily expanded to support more nodes or users; (iv) capable of supporting functions such as intelligent (automatic and dynamic) routing or repeating for reliable and stable network connectivity, while at the same time providing sufficient network coverage to remote and sparsely populated rural areas; and (v) compatible with enhanced network security measures to prevent outside interference, which is a prerequisite for many e-governance applications. The detailed list of equipment and technology will be determined in consultation with Assam Electronics Development Corporation Ltd. (AMTRON), a state-owned enterprise involved in the creation of the ASWAN. The TA will help the GOA select an appropriate vendor for a pilot project through the provision of bidding documents, including technical specifications and piloting requirements, the evaluation of bidders, and the contract negotiations. After installation and testing, the TA will help the GOA evaluate the outputs and advise it on how best to achieve its goals.

17. Testing of the innovative and cost efficient last-mile technology may best be done in a suburban or urban area, where more network connections are available. Once a technology works in the pilot project, it can be replicated for wider coverage in the remote rural areas.

C. Cost and Financing

18. The TA is estimated to cost $625,000 of which $500,000 will be financed on a grant basis by the Republic of Korea e-Asia and Knowledge Partnership Fund administered by ADB. The

Government of India will provide $125,000 equivalent in-kind support to finance counterpart staff, office accommodation, transport, and other expenses, including the facilitation of in-country studies and workshops. The detailed cost estimates and financing plan are in Appendix 2.

D. Implementation Arrangements

19. The Finance Department of the GOA will be the Executing Agency for the TA. AMTRON, a public sector agency under the GOA's Information Technology Department, will be the Implementing Agency. AMTRON will provide facilitation support for the project implementation in consultation with the Information Technology Department. For this purpose, the GOA will provide office space, furniture, equipment, and counterpart staff for TA consultants who will receive operational advice and guidance from the AMTRON Project Director. All procurement of equipment will be undertaken in accordance with ADB's *Procurement Guidelines* (2007, as amended from time to time) and all equipment will be handed over to the GOA upon completion of the TA. AMTRON will be responsible for procuring all equipment.

20. ADB will engage a team of consultants to execute the TA, comprising national consultants for 52 person-months, and a national supporting consultant for 10 person-months. A firm of consultants will be selected and engaged in accordance with ADB's *Guidelines on the Use of Consultants* (2007, as amended from time to time). To select a consulting firm, simplified technical proposal and quality and cost-based selection (QCBS) will be used. The consultants' outlined terms of reference are in Appendix 3. The consultants will prepare an inception report, an interim report, a draft final report, and a final report, and establish a fully equipped demonstration site. The TA's deliverables will also include an investment plan, a report on the evaluation of expressions of interests (EOIs) and requests for proposals, a bid package, report on evaluation of bidders and bids received, reports on evaluation of the pilot project and its outputs, and PPP-related loan documents. The inception report, including a time-bound work plan for TA implementation, will be submitted within 8 weeks of the start of consulting services. An interim report will be submitted within 4 months of the start of consulting services. A draft final report will be submitted 8 weeks before the end of consulting services, to be discussed at a meeting of the consultants, the GOA, and ADB before finalization. The final report will contain all the necessary information and analysis. The TA will be implemented in 11 months. It is expected to start in February 2008 and be completed by December 2008.

IV. THE PRESIDENT'S DECISION

21. The President, acting under the authority delegated by the Board, has approved ADB administering technical assistance not exceeding the equivalent of $500,000 to the Government of India to be financed on a grant basis by the Republic of Korea e-Asia and Knowledge Partnership Fund, for Deploying Innovative Information and Communications Technology for Supporting e-Governance in Assam, and hereby reports this action to the Board.

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets/Indicators	Data Sources/Reporting Mechanisms	Assumptions and Risks
Impact • Reduced digital divide by expanding the information and communications technology (ICT) accessibility to remote rural areas, and delivery of government services through expanded Assam state-wide area network (ASWAN) • Improved availability and quality of access to internet in Assam to facilitate e-governance, thereby promoting local economic development	• Increase in access to government portals by 5% per annum for 3 years in pilot areas after project completion • Increase in the ratio of online to over-the-counter public services by 2% per annum for 3 years in pilot areas after project completion • Increase in the number of internet users through enhanced last-mile connectivity by 10% per annum for 3 years in pilot areas after pilot project completion • Increase in the e-commerce related services and businesses by 5% per annum for 3 years in pilot areas after pilot project completion	• Compilation of government statistics • Regular reports from Assam State Government (GOA) on project implementation • ADB's technical assistance (TA) review missions	**Assumption** • GOA's commitment to reengineer public administrative procedures to be suitable for public service delivery **Risk** • Delays caused by coordination problems among the multiple agencies involved
Outcome • Improved capacity-building of public sector staff to implement e-governance applications • Improved legal, regulatory, and institutional framework to expand ICT accessibility and implement e-governance applications • Successful demonstration of the technical, legal and financial viability for cost efficient technology as last-mile connectivity option for complementing the GOA's ASWAN	• Identification of project components, including estimated costs, pilot demonstration site, hardware and software to be procured under pilot project • Finalization of all project features, including scope, cost estimate, financing plan, implementation arrangements, implementation schedule, detailed analysis of safeguard compliance issues, economic and financial viability • Training of a sufficient number of staff members in charge of implementing the project, through external and internal training programs	• Interim and draft final consultant report • Consultants' report on evaluation of human resources and institutional capacity development programs • Consultants' report on Business Investment Plan • Consultants' feasibility study report on cost innovative technology to ensure last-mile connectivity • Regular reports of GOA • ADB TA review missions	**Assumption** • GOA's strong support to develop further PPP projects based on recommendations from this TA project **Risks** • Delays in decision-making process • Delay due to insufficient capacity-building • Inadequate delivery of training due to resource constraints or lack of nationwide participation • Inadequate scope of a pilot project jointly agreed by GOA and related parties

Design Summary	Performance Targets/Indicators	Data Sources/Reporting Mechanisms	Assumptions and Risks
			• Failure of devices to fully function due to uncontrollable forces, such as harsh weather and excessive temperature, etc
Outputs 1. Development of an investment plan to improve ICT accessibility in remote rural areas and for expanding ICT infrastructure for e-governance network 2. Development of a legal, regulatory, and institutional framework, as well as human resource development programs 3. Feasibility study for cost efficient technology for expanding ASWAN through provision of last-mile connectivity in (i) defining the types and number of connections to be covered under the pilot project scope, including the geographical location in consultation with GOA; and (ii) preparing architectural design and system defining on how the technology would be implemented 4. Assisting GOA to implement a pilot project in designated area based on feasibility assessment	• Defining the scope and geographical location of pilot project and prepare implementation plan, architectural system, and blueprint solution for pilot project demonstration • Conducting a feasibility study for cost efficient technology for expanding ASWAN network • Developing a common architecture • Selecting a vendor that can provide cost innovative technology for demonstration site through build-own-test-operate-and- transfer approach • Developing a detailed plan to improve legal, regulatory, and institutional framework for e-governance • Measuring the result of pilot test and preparing test report • Developing an investment plan • Human resource development and institutional capacity-building in e-governance throughout the TA period • Assisting ADB to prepare documents to process loan project under PPP scheme	• Consultants' progress interim, and draft final reports • ADB missions to assess TA implementation procedure available within 5 months after the TA starts • ADB mission to provide education session for technology consultation	**Assumption** • Sufficient technical skills for the pilot project is locally available **Risks** • Delays in decision making by the Project Steering Committee (PSC) • Delay due to insufficient capacity-building • Delays in implementation of the functions due to operational or human resource restrictions • Implementation plan delays • Inadequate delivery of training due to resource constraints or lack of nationwide participation • Scope of pilot jointly agreed by GOA and related parties • Flexible architectural systems allowed for necessary changes necessitated during the pilot set-up • Failure of devices to fully operate due to uncontrollable forces such as harsh weather, excessive temperature, etc

Activities with Milestones	Inputs
• Define the scope and geographical location of pilot project, in consultation with the GOA, and prepare implementation plan, architectural system, and blueprint solution for pilot demonstration project within 1 month after TA starts. • Identify project components, including estimated costs, pilot demonstration site, hardware and software to be procured, and complete a full set of bid package in consultation with the GOA under pilot project within 3 months after the TA starts. • Finalize all project features, including scope, cost estimate, financing plan, implementation arrangements and schedule, detailed analysis of safeguard compliance issues, economic and financial viability within 3 months after the TA starts. • Complete a feasibility study for cost-efficient technology for expanding ASWAN network within 3 months after the TA starts. • Develop a common architecture within 4 months after the TA starts • Assist the GOA in the selection of a vendor to provide cost-efficient technology for demonstration site through build-operate-transfer approach within 5 months after TA starts • Develop a detailed and comprehensive plan to improve the legal, regulatory and institutional framework for e-governance within 6 months after the TA starts. • Measure the result of the pilot-test and prepare a test report within 1 month of completion of the demonstration operation and transfer. • Develop an investment plan with identification of potential financiers and sponsoring institutions within 7 months after the TA starts. • Train a sufficient number of staff members in charge of implementing the project, through external and internal training programs during TA completion stage. • Develop human resources and institutional capacity in e-governance throughout the TA implementation period. • Assist ADB in the preparation of loan documents to process a loan project under PPP scheme during the TA implementation period.	• TA financing of $500,000 on a grant basis by the Republic of Korea e-Asia and Knowledge Partnership Fund • Government to contribute in-kind to TA amounting to $125,000 • 52 person-months of national consulting services, and 10 person-months for supporting consultants • Pilot demonstration site project through the selection of a vendor who can build, operate and transfer the facility

COST ESTIMATES AND FINANCING PLAN
($'000)

Item	Total Cost
A. Republic of Korea e-Asia and Knowledge Partnership Fund Financing[a]	
1. Consultants	
a. Remuneration and Per Diem	
i. National Consultants	195.0
b. Travel	20.0
c. Reports and Communications	5.0
2. Pilot-testing Project (equipment procurement,[b] installation and pilot-testing, and training, etc.)	190.0
3. Procurement (computer hardware, software, etc.)	40.0
4. Contingencies	50.0
Subtotal (A)	**500.0**
B. Government Financing	
1. Office Accommodation and Transport	40.0
2. Seminars and Conferences, and Training	
a. Seminars and Conferences	30.0
b. Community Capacity Building	20.0
3. Reports and Communications	10.0
4. Miscellaneous Administration and Support Costs	25.0
Subtotal (B)	**125.0**
Total	**625.0**

[a] Administered by the Asian Development Bank.
[b] Routers, modems, and other related network equipment.
Source: Asian Development Bank estimates.

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

A. National Consultants

1. E-governance/Information and Communications Technology (ICT) Expert and Team Leader (3 person-months)

1. The tasks would include:

(i) As a team leader:
- (a) coordinating the inputs of all the consultants to provide sufficient information for project implementation,
- (b) participating in discussions with Asian Development Bank (ADB) and providing sufficient information to ADB for the technical assistance (TA) project implementation,
- (c) providing strategic guidance to the TA team for the execution of all project components,
- (d) providing inputs for contingency planning in consultation with the State Government of Assam (GOA) and ADB, and
- (e) assisting ADB to prepare documents which will ensure loan processing under the public-private partnership (PPP) scheme.

(ii) As an e-governance and ICT expert:
- (a) undertaking a holistic review of the current status of network connectivity and the related components of TA implementation;
- (b) preparing the strategies and broad action plans for project implementation;
- (c) preparing detailed levels of design parameters on last-mile connectivity;
- (d) preparing the network architecture for last-mile connectivity—subdivision to village level, for example;
- (e) finalizing the detailed technical specifications of the required equipment;
- (f) examining relevant international and domestic best practices, and incorporating them into the Assam program;
- (g) identifying potential risks to TA implementation, and suggesting how to mitigate them; and
- (h) conducting other tasks requested by ADB to implement the project.

2. ICT Specialist and Deputy Team Leader (8 person-months)

2. The tasks would include:
- (i) participating in discussions with ADB and providing information, as needed, to ADB;
- (ii) providing operational guidance to the TA team on all project components;
- (iii) undertaking a holistic review of the current status of network connectivity and the related components of the TA;
- (iv) preparing a detailed action plan for project implementation, with consideration of the e-governance initiative taken by the GOA under the National e-Governance Plan (NeGP);
- (v) program management and supervision of network implementation;
- (vi) preparation and submission of monthly and quarterly reports and quality assurance of all outputs;
- (vii) identifying project components, including estimated costs, pilot demonstration sites, and the hardware and software to be procured;

(viii) assisting ADB and GOA to procure the network implementation service from a provider;
(ix) finalization of all project features, including scope, cost estimate, financing plan, implementation arrangements, and implementation schedule;
(x) providing inputs to the network vendor on account of applications used in the state and the service which will be delivered through last-mile connectivity;
(xi) preparing the expression of interest, request for proposal (RFP) and the contract for network vendor selection;
(xii) based on the outcome and recommendation from the pilot project, developing one demonstration project for widening the scope of public-private partnership (PPP) and attracting further private sector investments—with the deputy team leader exploring preferred bidders for PPP and substantially completing its tendering process;
(xiii) assisting ADB to prepare documents which will ensure loan processing under the PPP scheme;
(xiv) preparing a report exploring e-services to be launched and indicating a preferred method of the launch, in order to help the GOA design a strong network infrastructure investment plan and identify a feasible option for e-governance development;
(xv) preparing a report on which countries have recouped their investment in e-governance faster than others, and in how many years; and
(xvi) conducting other tasks requested by ADB to implement the project.

3. Finance and PPP Specialist (3 person-months)

3. The tasks would include:
(i) undertaking financial feasibility analysis of proposed projects under the PPP mode and assess requirements for any viability gap funding;
(ii) developing business and revenue models for last-mile network implementation;
(iii) liaising with Assam Electronics Development Corporation Ltd. and other agencies to finalize business model;
(iv) liaising with Internet service providers in exploring business and revenue models;
(v) preparing a strategy report for full roll-out and PPP model;
(vi) developing the public sector comparator to determine comparable risk-adjusted cost indicators for public project delivery in the ICT infrastructure sector, with a view to enabling its application to be proposed for Viability Gap Funding;
(vii) building capacity of PPP cells to assess financial risks relating to PPP, and maintain active dialogue with potential sources of financing and encourage broad-based support for PPP schemes, in particular the viability gap financing arrangement; and
(viii) preparing a detailed project feasibility model, with financing models as a base, to help recommend the structure that would best suit the project, and assisting the team leader and deputy team leader to design PPP documents in consultation with ADB and GOA.

4. Capacity-Building and Public Administration Specialist (8 person-months)

4. The tasks would include:
(i) identifying demand, and requirement, for training and capacity building;
(ii) facilitating technical knowledge transfer to a technical team;
(iii) designing indicators to assess the effectiveness of the capacity development activities in targeted sector;
(iv) coordinating with all stakeholders at the field level, and if necessary, arranging workshops and training sessions for related stakeholders;

(v) managing any conflicts in the field during the TA implementation;
(vi) reviewing and analyzing vulnerabilities to corruption through the e-governance program;
(vii) managing public awareness issues and sharing lessons learned with the public, if needed; and
(viii) preparing a feasible plan for ensuring continuation of the capacity development activities after the TA implementation.

5. Networking Specialist (5 person-months)

5. The tasks would include:
(i) assisting the deputy team leader in preparing network architecture;
(ii) preparation of network requirement specifications and bill of materials for procurement of equipment;
(iii) assisting the deputy team leader in finalizing the scope of work for the network vendors;
(iv) helping deputy team leader evaluate technical proposal proposed by bidders;
(v) supervising delivery of network equipment;
(vi) supervising the pilot project implementation based on recommended last-mile connectivity technology;
(vii) providing advice for timely resolution of all technical issues, and trouble shooting; and
(viii) preparing a monitoring and evaluation framework for the last-mile connectivity.

6. Regulatory and Legal Specialist (2 person-months)

6. The tasks would include:
(i) advising the GOA on policy and regulatory changes required for the development of a regulatory and institutional framework to expand ICT accessibility and for e-governance applications over the long term;
(ii) providing legal opinions on the legal and regulatory environment, including identification of key bottlenecks related to PPP in infrastructure;
(iii) providing opinions on all legal aspects of the PPP projects;
(iv) providing desk research on current legal status of last-mile connectivity;
(v) providing recommendations for further course of action;
(vi) vetting implementation plan reports from the legal and statutory points of view;
(vii) providing legal and regulatory opinions which facilitate foreign investors' participation under the PPP scheme as well as all PPP proposals and draft contracts from a legal perspective;
(viii) providing necessary support in facilitating and simplifying legal and procedural frameworks in the work of the PPP cells;
(ix) reviewing guidelines and documents on procurement, contracting, safeguards, compliance, and others topics; and
(x) providing legal and regulatory views on other related issues.

7. Sectoral Specialist (2 person-months)

7. The task would include:
(i) providing field assistance in domain-related issues, based on the chosen option of last-mile connectivity;
(ii) examining and analyzing data and studies, and conducting detailed surveys, in order to assess the feasibility of the chosen option;

(iii) presenting and discussing the details of the suggested project design to the relevant authorities in order to get project approvals; and
(iv) integrating international best practices and experiences from similar undertakings elsewhere into the project, and, if similar systems are in use, creating benchmarks based on these projects for the pilot design.

8. Procurement Specialist (3 person-months)

8. The tasks would include:
(i) working under the guidance of the deputy team leader in preparing a detailed procurement process and timetable, expression of interest, RFP, a full set of tender documents, and the contract for network vendor selection in consultation with the GOA;
(ii) assisting the deputy team leader in procurement related management;
(iii) assisting the networking specialist in preparing a monitoring and evaluation framework;
(iv) assisting the deputy team leader in preparing project features, including scope, cost estimate, financing plan, implementation arrangements, and implementation schedule;
(v) assisting the deputy team leader in the evaluation process using the evaluation criteria as mentioned in the RFP; and
(vi) assisting the Implementing Agency to negotiate with the preferred bidder once that bidder has been endorsed by the GOA.

9. Field Engineer (9 person-months)

9. The tasks would include:
(i) working under the direction of the team leader and deputy team leader, collecting all field level data pertaining to identification of pilot area for last-mile connectivity;
(ii) providing support for preparation of the network architectural design;
(iii) providing support for preparation of technical specifications for the hardware and software components to be procured for pilot implementation; and
(iv) being responsible for working with the last-mile connectivity vendor at the field level during implementation.

10. Documentation Officer (9 person-months)

10. The tasks would include:
(i) working under the direction of the team leader and deputy team leader;
(ii) being responsible for formatting and editing all documents and reports;
(iii) collating primary and secondary information, and providing necessary research and analytical support to the key consultants;
(iv) carrying out assigned tasks entrusted by other consultants when they are not in the field; and
(v) providing support for workshops and focus group meetings.

B. Supporting Consultant

1. Office Secretary (10 person-months)

11. The tasks would include:
(i) providing logistical support for all team members,

(ii) providing support and follow-up support for all key meetings and following up with various agencies, and
(iii) providing secretarial services to all team members for such activities as report generation and distribution.

12. The field engineer and documentation officer would support other national consultants in data collation and analysis in order to complete tasks on schedule. They would also fill in when the national consultants are not in the field.

13. The inputs listed above for the consultants' positions are not final and will be realigned during TA implementation.