Document of
The World Bank

Report No.: 46288-IN

PROJECT PERFORMANCE ASSESSMENT REPORT

INDIA

TELECOMMUNICATIONS SECTOR REFORM TECHNICAL ASSISTANCE PROJECT (LOAN 4555-IN)

October 23, 2008

Sector Evaluation Division
Independent Evaluation Group (World Bank)

Currency Equivalents (annual averages)

Currency Unit = Indian Rupees (INR)

1998	US$ 1.00	INR 41.5
1999	US$ 1.00	INR 43.1
2000	US$ 1.00	INR 45.1
2001	US$ 1.00	INR 47.3
2002	US$ 1.00	INR 48.5
2003	US$ 1.00	INR 46.3
2004	US$ 1.00	INR 45.1
2005	US$ 1.00	INR 44.0
2006	US$ 1.00	INR 45.3

Abbreviations and Acronyms

ASMS	Automated Spectrum Management System
BSNL	Bharat Sanchar Nigam Ltd
CAS	Country Assistance Strategy
DOT	Department of Telecommunications
FDI	Foreign Direct Investment
GOI	Government of India
HF	High Frequency
ICI	Information and Communication Infrastructure
ICR	Implementation Completion Report
IEG	Independent Evaluation Group
IEGWB	Independent Evaluation Group (World Bank)
ITU	International Telecommunication Union
MOC	Ministry of Communications
NFAP	National Frequency Allocation Plan
NSMS	National Spectrum Monitoring System
PDO	Project Development Objective
PIU	Project Implementation Unit
PMC	Project Management Consultant
PPAR	Project Performance Assessment Report
SACFA	Standing Advisory Committee on Radio Frequency Allocation
SHF	Super High Frequency
TRAI	Telecom Regulatory Authority of India
TDSAT	Telecom Disputes Settlement and Appellate Tribunal
TEC	Telecommunication Engineering Center
UHF	Ultra High Frequency
VHF	Very High Frequency
WMO	Wireless Monitoring Organization
WPC	Wireless Planning and Coordination Wing

Fiscal Year

Government: April 1 - March 31

Director-General, Independent Evaluation	:	Mr. Vinod Thomas
Director, Independent Evaluation Group (World Bank)	:	Ms. Cheryl Gray
Manager, Sector Evaluation Division	:	Ms. Monika Huppi
Task Manager	:	Mr. Peter Freeman

IEGWB Mission: Enhancing development effectiveness through excellence and independence in evaluation.

About this Report

The Independent Evaluation Group assesses the programs and activities of the World Bank for two purposes: first, to ensure the integrity of the Bank's self-evaluation process and to verify that the Bank's work is producing the expected results, and second, to help develop improved directions, policies, and procedures through the dissemination of lessons drawn from experience. As part of this work, IEGWB annually assesses about 25 percent of the Bank's lending operations through field work. In selecting operations for assessment, preference is given to those that are innovative, large, or complex; those that are relevant to upcoming studies or country evaluations; those for which Executive Directors or Bank management have requested assessments; and those that are likely to generate important lessons.

To prepare a Project Performance Assessment Report (PPAR), IEGWB staff examine project files and other documents, interview operational staff, visit the borrowing country to discuss the operation with the government, and other in-country stakeholders, and interview Bank staff and other donor agency staff both at headquarters and in local offices as appropriate.

Each PPAR is subject to internal IEGWB peer review, Panel review, and management approval. Once cleared internally, the PPAR is commented on by the responsible Bank department. IEGWB incorporates the comments as relevant. The completed PPAR is then sent to the borrower for review; the borrowers' comments are attached to the document that is sent to the Bank's Board of Executive Directors. After an assessment report has been sent to the Board, it is disclosed to the public.

About the IEGWB Rating System

IEGWB's use of multiple evaluation methods offers both rigor and a necessary level of flexibility to adapt to lending instrument, project design, or sectoral approach. IEGWB evaluators all apply the same basic method to arrive at their project ratings. Following is the definition and rating scale used for each evaluation criterion (additional information is available on the IEGWB website: http://worldbank.org/ieg).

Outcome: The extent to which the operation's major relevant objectives were achieved, or are expected to be achieved, efficiently. The rating has three dimensions: relevance, efficacy, and efficiency. *Relevance* includes relevance of objectives and relevance of design. Relevance of objectives is the extent to which the project's objectives are consistent with the country's current development priorities and with current Bank country and sectoral assistance strategies and corporate goals (expressed in Poverty Reduction Strategy Papers, Country Assistance Strategies, Sector Strategy Papers, Operational Policies). Relevance of design is the extent to which the project's design is consistent with the stated objectives. *Efficacy* is the extent to which the project's objectives were achieved, or are expected to be achieved, taking into account their relative importance. *Efficiency* is the extent to which the project achieved, or is expected to achieve, a return higher than the opportunity cost of capital and benefits at least cost compared to alternatives. The efficiency dimension generally is not applied to adjustment operations. *Possible ratings for Outcome:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Risk to Development Outcome: The risk, at the time of evaluation, that development outcomes (or expected outcomes) will not be maintained (or realized). *Possible ratings for Risk to Development Outcome:* High Significant, Moderate, Negligible to Low, Not Evaluable.

Bank Performance: The extent to which services provided by the Bank ensured quality at entry of the operation and supported effective implementation through appropriate supervision (including ensuring adequate transition arrangements for regular operation of supported activities after loan/credit closing, toward the achievement of development outcomes. The rating has two dimensions: quality at entry and quality of supervision. *Possible ratings for Bank Performance:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Borrower Performance: The extent to which the borrower (including the government and implementing agency or agencies) ensured quality of preparation and implementation, and complied with covenants and agreements, toward the achievement of development outcomes. The rating has two dimensions: government performance and implementing agency(ies) performance. *Possible ratings for Borrower Performance:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Contents

This report was prepared by Peter Freeman, who visited India to assess project performance during February, 2008. Romayne Pereira provided administrative support.

Principal Ratings

	*ICR**	*ICR Review**	*PPAR*
Outcome	Satisfactory	Moderately Satisfactory	Moderately Satisfactory
Institutional Development Impact**	Substantial	Substantial	———
Risk to Development Outcome	———	———	Negligible to Low
Sustainability***	Likely	Likely	———
Bank Performance	Satisfactory	Satisfactory	Moderately Satisfactory
Borrower Performance	Satisfactory	Satisfactory	Moderately Satisfactory

* The Implementation Completion Report (ICR) is a self-evaluation by the responsible Bank department. The ICR Review is an intermediate IEGWB product that seeks to independently verify the findings of the ICR.
**As of July 1, 2006, Institutional Development Impact is assessed as part of the Outcome rating.
***As of July 1, 2006, Sustainability has been replaced by Risk to Development Outcome. As the scales are different, the ratings are not directly comparable.

Key Staff Responsible

Project	*Task Manager/Leader*	*Division Chief/ Sector Director*	*Country Director*
Appraisal	Rajesh B Pradhan	Marilou Jane D Uy	Edwin R Lim
Completion	Peter L Smith	Philippe Dongier	Fayez S Omar

Preface

This is the Project Performance Assessment Report (PPAR) for the India Telecommunications Sector Reform Technical Assistance Project (Loan 4555-IN), for which the World Bank approved a loan of US$62.00 million equivalent on June 6, 2000. At appraisal the total project cost was estimated to be US$72.00 million, with US$10.00 million to be contributed by the Government of India (GOI). During project implementation the GOI requested two cancellations of the loan in the amounts of US$20.00 million and US$7.67 million in January 2004 and February 2006 respectively. After a final cancellation of US$5.71 million at project closure, which was 15 months later than planned due to implementation delays, some US$28.62 million had been disbursed, or 46 percent of the original loan amount. The final total project cost disbursed was US$29.88 million.

The project was selected for assessment because of the importance it accorded to strengthening the regulatory and dispute settlement framework in India so as to enable acceleration in sector growth. There were also important lessons to be learned from the process of modernizing the country's radio frequency management and licensing systems.

IEG prepared this report based on an examination of the relevant Project Appraisal Document (PAD), Implementation Completion Report (ICR), legal agreements, project files and archives, as well as other relevant reports, memoranda, and working papers. Discussions were also held with Bank staff in both Washington D.C. and in New Delhi. An IEG field mission visited India in February 2008, conducted site visits, and discussed both the project and the effectiveness of Bank assistance with relevant officials and stakeholders. The mission appreciates the courtesies and attention given by these interlocutors as well as the support provided by the Bank's office in New Delhi.

Following standard IEG procedures, copies of the draft PPAR was sent to government officials and agencies for their review and responses received are included in Annex C.

Summary

This is the Project Performance Assessment Report (PPAR) for the *India Telecommunications Sector Reform Technical Assistance Project (Loan 4555-IN),* which was intended to support the reform of the country's telecommunications sector. An acceleration of investment and interest from the private sector began after legislation for major sector reform was enacted in 1994, but grew exponentially from 1999 after further reforms were introduced. Both the fledgling regulatory agencies that were created and the responsible government department needed urgent capacity building support to strengthen their ability to meet the unprecedented demand for their services.

The project development objective (PDO) was "to strengthen elements of the policy and regulatory environment to promote private sector investment and competition in the telecommunications sector in India". This was to be achieved by assisting the Department of Telecommunications (DOT) to strengthen its functions, including modernization of its radio frequency management and licensing systems, and by strengthening the capacity of the Telecom Regulatory Authority of India (TRAI) and the Telecom Disputes Settlement and Appellate Tribunal (TDSAT) to regulate the sector.

The project preparation team recognized the importance of monitoring and evaluation (M&E) and devised acceptable indicators for the main outputs, but made little attempt to deal with the attribution question in respect of measurable outcomes—probably because the PDO as framed was so broad. M&E design was thus inadequate. During implementation this aspect received more attention. TRAI, for example, has put in extensive work to ensure that the activities of the stakeholders in the sector are monitored regularly and produces a quarterly report detailing inter alia ownership, growth, costs and market share. Overall, M&E was modest.

Taking into account the progress towards achieving the PDO and the assessments of relevance, efficacy and efficiency, IEG's overall project outcome rating is *moderately satisfactory.* While the capacity building components were substantially accomplished, the shortcomings in respect of the equipment component, which was by far the largest in the project, were too important to permit a fully satisfactory rating. Project delays led to the benefits of the new systems not being fully realized until over three years after the original closing date of the project. Also, the Super High Frequency (SHF) portion of the project was cancelled and while at this time only ten percent of interference complaints arise from use of the spectrum above the 3 GHz band, this percentage may grow in the future. It was not feasible to calculate an economic rate of return for this project, but there is no doubt that both the above factors would have negatively affected the benefit stream and added to the costs. In addition, too much capital was tied-up in the appraisal cost estimates for the project, and in the end less than half of the original project cost estimate was actually disbursed.

Though only partly attributable to the project, the ongoing liberalization of the sector has continued at a very fast pace. Foreign direct investment has continued to increase, call charges have fallen, and teledensity has improved dramatically. The capacity building initiative in this project has helped to strengthen agencies that have come to be

well regarded and indeed have an international reputation. TRAI and TDSAT receive visits from other developing country agencies eager to learn from the Indian experience. Implementation of sector reform has received a substantial overhaul during the last five years and is well set to cope with a technological environment of constant change. Some concerns are evident due to a lack of suitably qualified staff in the DOT, but this is part of a generic problem in the Indian civil service which the GOI is addressing separately. On balance, telecommunications and technology in India are on track to be amongst the best in the dynamic and competitive market in Asia, and the risk to development outcome of this project failing is seen as *negligible to low.*

The Bank did a good job in advocating the expansion of the project design to give general institutional support to the sector reforms. It also supervised the capacity building component well, was flexible, and gave additional advice on technical and strategic issues at the government's request which it clearly valued. However, the cost for the project was seriously over-estimated despite the use of experienced consultants, more thought could also have gone into the design of the monitoring indicators specified, and the implementation risks, though properly identified, were under-estimated. The supervision problems of the equipment procurement, installation and commissioning were well-documented and it is clear that considerable discussion took place concerning the inadequacy of the project implementation unit (PIU) and the need to retain an experienced project manager. The overall rating is *moderately satisfactory.*

The Borrower participated with commitment during preparation, but loan negotiations were delayed by around eight months awaiting the appointment of consultants to assist the Wireless Planning and coordination Wing (WPC) to prepare bidding documents. This delay was due to difficulty in securing government approval for the selection of consultants under Bank guidelines, which differ from government procedures.

The performance of the implementing agencies in respect of capacity building was very positive and few significant problems were encountered. However, the WPC component experienced considerable delays because of problems with contractors, and a lack of empowerment and decision-making capacity in the PIU. The Borrower rating, overall, is *moderately satisfactory.*

A number of important lessons can be gleaned from the design and implementation of this project:

- When the experience of the implementing agency in managing projects is limited, and especially when such projects are complex, it is essential to appoint a project management consultant early-on to compensate for any gaps in expertise. Most of the difficulties experienced in the implementation of the Telecom Sector Reform Project, involving the modernization of the country's radio frequency and licensing system, were attributable to inability to take decisions and lack of capacity to find solutions to problems;

- In a sector where technology advancement is a key driver of change, it is necessary to build sufficient flexibility and foresight into the projects. In the India Telecom Reform Project, flexibility allowed for project realignment during

implementation, when required, thus facilitating a redefinition of needs. An example of this was an unexpected need to gain an understanding of television broadcasting signal technology. However, with regard to the need for foresight, a better understanding of the relationship between rapid technological change and project costs could have avoided a serious overestimate of equipment costs, and this would have saved US$ 331,000 in front-end fees, while the Bank would have better utilized part of its loan. Obsolescence also occurs more quickly in the telecommunications field and so it is critical to avoid delays in project completion;

- Investing in capacity building and institutional development is critical to ensuring effective project implementation and project sustainability. This was a crucial aspect of strengthening the regulatory and dispute settlement framework in India. However, it is equally important in ensuring operational effectiveness, especially for equipment design, procurement and installation. Such investments need to be supported by clear leadership and a willingness to implement reforms at a senior level. Sometimes the prevailing organizational and business culture can impede satisfactory progress due to competing priorities and agendas. When such a serious blockage is encountered the issue should be elevated to an appropriate level of decision-making and, if necessary, pursued on a programmatic or multi agency basis.

Vinod Thomas
Director-General
Evaluation

1. Background and Context

1.1 India, with a population of just over a billion people is the second most populated country in the world. Prior to the mid nineties, its telecommunications[1] industry was stagnant – teledensity[2] had grown by only 1.92 percent in 50 years (1948-98). There was a high level of unmet demand for basic telephone service and inadequate availability, especially in rural areas. Applying for a telephone service under the state-owned monopoly was a burdensome process and customer service was often dismal. Thus the move to encourage competition and the rapid expansion of the subscriber base in India in the last ten years has been a remarkable, success story and one in which there is considerable learning for other countries wishing to undertake a similar transition.

1.2 During the last ten years teledensity in India has grown to 18 percent (2007), and recently the mobile subscriber base has been growing by 6 million *every month*. Tariffs charged have consistently fallen, and India now has the fourth largest telecom network after China, the US, and the Russian Federation. This has attracted significant foreign direct investment, stimulated economic growth and encouraged the location of business process outsourcing. The Indian telecom service industry is contributing at least 2.7 percent of the country's total GDP[3].

1.3 A key resource for wireless technology based information and communication infrastructure (ICI) is the radio spectrum, and it is imperative that it is monitored and managed in the most efficient and transparent manner in the interest of the country as a whole[4]. Convergence in communication technologies, services and firms has also blurred the boundaries between the telecoms and broadcasting sectors, and impacted the demand for the use of the radio spectrum.

1.4 The reform of the telecom sector began with the acceptance of a new National Telecom Policy in 1994 which was followed by an even more ambitious plan in 1999. This caused a surge in delivery that placed unprecedented demands on the authorities responsible for its implementation. The 1999 updated policy acknowledged that proper management of India's radio spectrum is critical and that a key objective was to achieve efficiency and transparency in spectrum management.

1.5 The Telecommunications Sector Reform Technical Assistance Project was approved in June 2000 and aimed to strengthen the respective government institutions to meet these challenges. While the success of the implementation of the reform measures can only partly be attributed to the project, it certainly played a crucial role in the ensuing transformation. This report evaluates the extent to which this technical assistance project met its development goals, supported the telecom strategy of the Government of India (GOI), and extracts what lessons can be learned from the implementation experience.

---

[1] Henceforth called "telecom" in this report
[2] Telephone lines per 100 persons.
[3] Telecom Regulatory Authority of India estimate, 2007.
[4] Briefing Report "Radio Spectrum Management Development ion India" World Bank, June 2006

2. The Institutional Framework – Sector Overview

2.1 It is essential before proceeding further to understand the basic institutional framework for telecoms in India. The responsible ministry is the Ministry of Communications (through the Telecommunications Commission charged with formulating the sector strategy, and the Department of Telecommunications [DOT]—the licensing authority). In 1994, the monopolistic nature of service provision was changed, opening-up the operation of basic and cellular services to private investors. In order to regulate the new environment, the Telecom Regulatory Authority of India (TRAI) was established in 1997[5]. TRAI is a statutory body with quasi-judicial powers responsible for inter alia recommending the needs and timing of entry of new service providers, the terms and conditions of the licenses, technical compatibility and effective interconnection between service providers, and ensuring compliance of license conditions with universal service obligations and other internationally practiced common regulatory principles, consistent with India's World Trade Organization commitments.

2.2 Because there was a conflict of interest as the DOT was both the main operator and the licensing authority, the government and service provision functions were separated in 1999. The service function was corporatized as Bharat Sanchar Nigam Ltd. (BSNL) in 2000 and part of the government function of DOT is carried out by the principal agency, the Wireless Planning and Coordination Wing (WPC) which is responsible for radio frequency spectrum policy, planning, licensing, administration, monitoring and enforcement. The Wireless Monitoring Organization (WMO) is the field agency of WPC, while the Telecommunications Engineering Center (TEC) is responsible for setting technical standards for equipment and network interconnection. A Standing Advisory Committee on Radio Frequency Allocations (SACFA) is responsible for formulating India's National Frequency Allocation Plan, recommending on major frequency allocation issues, and providing site clearances for the installation of radio equipment.

2.3 In 2000, the disputes settlement function formerly vested in TRAI was transferred to a new body, the Telecom Disputes Settlement and Appellate Tribunal (TDSAT), which meant that appeals no longer needed to involve the high courts. Prior to the establishment of TDSAT, TRAI, with limited in-house expertise, was being overwhelmed by court challenges from powerful public and private operators. Since the appointment of the chairperson and members of TDSAT were made in consultation with the Chief Justice of India, the impartiality and high standing of the tribunal were assured. This left TRAI to focus on regulatory matters and restored its credibility.

---

[5] Telecom Regulatory Authority of India Act, 1997

3. The Project

Project Objective

3.1 The stated development objective of the project (PDO) as articulated in the PAD and unchanged during implementation was as follows:

"To strengthen elements of the policy and regulatory environment to promote private sector investment and competition in the telecommunications sector in India"

3.2 This was to be achieved by assisting the DOT to strengthen its government functions, including modernization of its radio frequency management and licensing systems, and by strengthening the capacity of TRAI and TDSAT to regulate the sector.

3.3 The development objective, though broadly worded, has two elements (regulatory strengthening and private sector promotion). Both were substantially relevant to the 1998 and 2005 Country Assistance Strategies (CAS), which stressed improving the effectiveness of government and promoting private sector-led growth. The latest CAS aims to create a well-regulated, but competitive enabling environment, enhancing private sector entry, and participation and investment in the Indian economy—especially infrastructure. The project also sought to assist the implementation of the country's recently updated National Telecommunications Policy. It provided institution building for the newly established entities of TRAI and TDSAT.

3.4 Originally, the GOI had been interested in Bank assistance largely for the procurement of technical services and equipment for radio spectrum monitoring and management as a result of increased demand due to sector reform already initiated in 1994. The Bank team, however, successfully and appropriately convinced GOI that to accelerate sector growth there was a need to provide special support to the new sector institutions and to the successful introduction of the updated policy initiative involving capacity building through consultancy studies, training and technical assistance.

Project Components and Costs

3.5 *DOT Component (US$56.38 million)*

1. Assistance to the DOT (headquarters) to support the strengthening of DOT's government functions by financing provision of equipment, consultants' services, and training, (0.15 percent of DOT component cost).

2. Support to the WPC for equipment and technical assistance in the field of spectrum management (98.85 percent of DOT component cost) as follows:

- Procurement and installation of an automated spectrum management system (ASMS) to automatically process requests for the assignment of radio frequencies, wireless licenses etc.;

- Procurement and installation of a national spectrum monitoring system (NSMS) through upgrading the radio monitoring facilities of the WMO—the field organization of WPC. The two systems were to be set up in an integrated manner, with connectivity with the wireless monitoring headquarters, four regional headquarters (located at Chennai, Delhi, Kolkata, and Mumbai) and 22 wireless monitoring stations throughout India;

- Technical training of staff assigned to operate and maintain these systems, and for WPC's senior management;

- Technical assistance to WPC for setting up a Project Management Consultancy (PMC) to assist in expediting the procurement process and to strengthen WPC's institutional capabilities.

3. Technical assistance for capacity building in the TEC, comprising awareness of emerging technologies, and staff training that included seminars, attendance of external formal training programs, in-house training, a tour of regulatory agencies, and staff exchanges, (1.0 percent of DOT component cost).

3.6 *TRAI/TDSAT Component (US$5.62 million)*

1. Support for TRAI comprising technical assistance to strengthen the organization's ability to regulate the sector. It includes support for consultancy studies on priority regulatory issues and staff training, (90 percent of TRAI/TDSAT component cost);

2. Assistance to TDSAT to support the implementation of a program of technical assistance for strengthening the institutional capabilities of TDSAT in the areas of adjudication and dispute resolution, (10 percent of TRAI/TDSAT component cost).

3.7 The costs for the project components are given in Table 3.1 below:

Table 3.1 Components and Costs (US$ millions) for the Telecommunications Sector Reform Technical Assistance Project (Loan: 4555-IN)

COMPONENT	APPRAISAL BANK	APPRAISAL BORROWER	APPRAISAL TOTAL	ACTUAL BANK	ACTUAL BORROWER	ACTUAL TOTAL
DOT COMPONENT (HQ, TEC & WPC)	56.38	9.49	65.87	25.27	5.00	30.27
REGULATORY COMPONENT (TRAI & TDSAT)	5.62	0.51	6.13	2.73	0.00	2.73
TOTAL	62.00	10.00	72.00	28.00	5.00	33.00

4. Implementation

Quality at Entry

4.1 The project was not reviewed by the World Bank's Quality Assurance Group prior to appraisal. The ICR team believed, however, that the project was satisfactory at entry because the project design factored in India's telecoms background, the needs and objectives of the GOI, as well as the policies and trends pertinent to the sector. The PAD clearly had identified the importance of technical assistance to the various agencies and the project design took into account the need for additional capabilities for spectrum management resulting from sector growth.

4.2 On the other hand, although during preparation a risk was identified that the equipment provided by the project might not be implemented in a timely and effective manner. Mitigating measures to address this issue, in the event, proved insufficient. This was in part because the project management consultants were not recruited early enough, but may also have been due to the degree of complexity of the WPC component. The estimated project costs were also far too high. Moreover, comparatively little thought was given to project M&E. In IEG's view the quality at entry was moderately satisfactory.

Implementation Problems

4.3 The institutional strengthening elements of the project were mostly concluded without any serious issues arising, although in the case of TRAI there was some initial delay in utilizing available funds because there was the possibility that TRAI would be subsumed within a larger body—the Convergence Commission of India. However, this did not eventuate, and the utilization of funds then accelerated.

4.4 The component encountering most of the difficulties in implementation was the procurement and installation of equipment for WPC. There were persistent delays throughout project implementation. The quality of some work was unsatisfactory and had to be redone—the failure rate of core equipment was also unusually high. There were divergences between the contractor and the WPC regarding the procedure for verification of the accuracy of measurements and the interpretation of results, while frequent changes in the composition of the contractors' team made it difficult to maintain consistency. Divergences between the WPC and the WMO on technical procedures also caused some delay due to an unclear chain of responsibility for choosing testing procedures.

4.5 An insufficient number of full-time staff was available for the Project Implementation Unit (PIU) which seriously weakened effective project implementation. The workload of both WPC and WMO staff was steadily increasing at this time without any commensurate increase in staffing. Consequently the Bank supervisory team repeatedly recommended to the implementing agency to urgently strengthen the PIU with adequate staff on a full-time basis. However, there was a reluctance to hire foreign consultants, and a project management

consultant was only appointed in June 2003, commencing his assignment in August 2003—three years after the project became effective[6].

4.6 The problems described above could have been minimized by strengthening the PIU's capacity and appointing a PMC at the outset. Even this, however, would not necessarily have resolved all the delays, since WPC and WMO (sometimes with differing agendas) did not always take advantage of the PMC expertise, even after the PMC was appointed. As pointed out in the ICR, the incentives and organizational culture within DOT constrained its ability to make quick decisions and provide timely solutions to problems[7]. Delays in procurement, for example, are commonly experienced in other Bank-financed India programs, and this generic issue may need to be addressed on a multi agency basis. The potential benefits of the new spectrum management and monitoring system were thus delayed and overshadowed by disagreements over contractual issues. Continuous implementation delays eventually resulted in an extension of the closing date to March 2006 (from December 2004), cancellation of part of the loan, and the project at times being classified as "at risk".

4.7 Three loan cancellations took place during implementation. In January 2004 US$20 million was cancelled. This was, according to the ICR, due to savings through the use of international competitive bidding procurement procedures and a reduction in equipment prices due to advances in technology. IEG confirms that while these reasons were valid, the size of the amount estimated at appraisal remains a cause for concern, since there was a substantial opportunity cost of capital unnecessarily tied-up through this over-estimate, which was clearly too generous.

4.8 The second cancellation was for US$7.67 million in February 2006, largely due to the persistent delays in the implementation of the WPC component, even after extension of the closing date, and the final cancellation of US$5.71 million reflected the fact that the super high frequency (SHF) fixed and mobile monitoring system could no longer be completed before the closing date. Although there was some speculation that the GOI might fund the SHF from own funds, at the time of the IEG mission it was evident that the monitoring equipment for the SHF would not be supplied as WPC and the contractor had not been able to reach agreement on specifications. Thus in the end only 46 percent of the loan was disbursed, the remainder being cancelled.

Demand for the Radio Spectrum

4.9 The demand for the radio spectrum in India is high, especially because of the enormous growth of cellular subscribers and internet users. Spectrum usage remains largely

---

[6] The time line of events during implementation is recorded in considerable detail in the ICR, Annex 9, from which this information is drawn.

[7] Public disclosure of the ICR was authorized in September 2006. Some of the problems discussed relate to more generic problems throughout the Indian civil service. These are acknowledged by the GOI, which has set up a Commission to look at the potential for streamlining delivery of public programs and improving service to the public. For further reading see, for example, *the Economist* leader and briefing on India's civil service, (March 8, 2008).

in the hands of government or quasi government bodies including defense, civil aviation, space, shipping, railways, police, broadcasting and others. Historically, much of the spectrum was allocated before technology began to make huge demands on it. Because some allocated bands of the airwaves are overcrowded, customers have increasingly been complaining of poor connectivity leading to an excessive number of "dropped calls". This issue may be resolved with a reallocation from some of the departments including the military, but efforts to release spectrum currently assigned to such users is proving to be a slow process. In the meantime technological advances have enabled more efficient use of the spectrum with more calls to be packed-in to a given space using so-called third generation (3G) networks. However, this is not a long-term solution.

4.10 Current spectrum management practice in India is based on a traditional centralized command model, but a growing number of countries are beginning to turn to alternative market based approaches to spectrum management, whereby the spectrum allocations are auctioned. IEG believes that this approach has merit, but that WPC would need to recruit staff with economic skills and the appropriate government departments would have to establish a set of rules for this to work. However, there are precedents in other countries (Ofcom, the independent telecom regulator in the United Kingdom, for example) that could be adapted for local use. The lifetime of spectrum licenses in India is also relatively short in duration in comparison to international practice. Consideration could also be given to elevating the status of spectrum management in India to a higher level of government. In some countries this means there would be a greater degree of independence with a reporting line to the Prime-Minister's Office or to the Cabinet Secretariat.

5. Monitoring and Evaluation

Design

5.1 Designing performance indicators for institutional performance and regulatory quality can be a challenge, and in this instance the result was at best modest. Project preparation took place in 1999 before it was common practice in the Bank to give serious attention to M&E in all sectors[8]. There was also little attempt to deal with the attribution question in the design. In the PAD there was a proposal to measure the increase in foreign direct investment (FDI) in the sector since this would at least in part have been due to improvements in the effectiveness of the regulatory environment. Similarly, it was indicated that there should be evidence that the GOI was continuing with its commitment to sector reform as articulated in its National Telecom Policy of 1999, including further liberalization of the sector. One measure of the latter was deemed to be evidence of licenses issued for inter-circle domestic long distance service. All these indicators were in line with the PDO, but it was difficult in both cases to isolate progress due solely to the project. The main reason in this regard was that the PDO was so broad in scope.

[8] A report on "Performance Indicators for the Telecommunications Sector" was prepared in 2004 in fulfillment of one of the requirements of the Wapenhans Report to prepare performance indicators for each sector.

5.2 The goal to assign frequencies for earmarked bands within 15 days of application by 2004 was aimed at improving efficiency in radio frequency allocation and thus improving the regulatory environment. However, it was probably too challenging a target given the bureaucratic and political constraints prevailing. In addition there were sensible output indicators measuring progress with equipment installation, the publishing of a National Frequency Allocation Plan (NFAP), and completion of numerous studies, mainly for TRAI. These enabled project progress to be monitored properly during implementation.

Implementation

5.3 Although the PAD proposal of measuring the FDI was dropped from the key performance indicators during implementation (as shown in the ICR log frame), the ICR authors nevertheless did obtain and include in the ICR text useful FDI statistics for the sector. These were very positive, although there is still a question of attribution; the extent to which this good performance was due to the Bank project is partly conjectural. There was, however, a good effort to monitor the indicators devised, and in the case of the studies undertaken for TRAI there was a useful annex in the ICR in which there was an indication of the outcome of each study completed and how the results were utilized. In the view of the IEG team this added value. However, implementation of M&E is considered to be modest.

Dissemination

5.4 The main milestones indicated above and a considerable amount of additional information pertaining to the sector is published by TRAI as part of its information disclosure initiative. Since 2006 this information has been available on its website in the form of a detailed quarterly report of performance indicators[9]. Dissemination of M&E is regarded as substantial and industry sources such as the Association of United Telecom Service Providers of India confirmed that there is an active utilization of the information provided. The overall rating for M&E as a whole is *modest.*

6. Project Outcomes

6.1 Because the umbrella-like PDO was so broadly worded and involved a number of organizations, the relative achievements of the intermediate outcomes in each case will first be reviewed, and then an overall assessment made of the outcome under the ratings in section seven.

Department of Telecommunications

DOT Headquarters

6.2 This component was very small in size, consisting of strengthening the department's functioning through provision of consultant's services, and some training courses. The main

[9] The quarterly report is available electronically to the public on TRAI's website and contains a wealth of statistics monitoring service performance, quality aspects, the size of the subscriber base and financial information including costs of making calls and using facilities.

item, a local consultant's study, was to assess policy and regulatory options for the rapid expansion of rural communities in India, taking into account key factors such as the economics of rural telecommunications and developments in technology. This was undoubtedly a useful piece of work to establish a basis on which to launch an improvement in rural coverage. The Bank has encouraged the DOT to take this matter further and commence with pilot implementation, but there is currently still some debate as to the best way to finance such an initiative.

Telecommunications Engineering Center

6.3 This was also a small, but important component comprising nine international training programs and costs to cover participation of DOT staff at a number of meetings organized by the International Telecommunication Union (ITU). Since TEC provides technical support to the DOT on technology matters, the training programs helped towards strengthening institutional capabilities and were designed to suit the specific requirements of TEC. The training courses covered a range of topics including number portability and other advances in switching technologies, intelligent network systems, and converged networks. A total of 38 persons participated.

6.4 Some 31 staff members attended the ITU meetings; one visible output of this has been a number of papers presented to ITU Study Groups by DOT staff, but more importantly the publication of specifications covering a wide spectrum of telecommunications technologies including next generation networks, and Wimax technologies. Once these new standards were ratified by ITU member states, this enabled the Indian telecommunication market to acquire the latest equipment technology to provide new and quality services. IEG observed that the extreme competitiveness of the market ensured that the adoption by the private sector was almost immediate. While it is not possible to fully measure the extent of the impact of this technical assistance, the work has clearly been successfully implemented and the telecommunication market, according to the users interviewed by IEG, has benefited as a result.

Equipment and technical assistance for the Wireless Planning and Coordination Wing

6.5 This component accounted for the largest portion of the project cost by far and also encountered the most difficulties in implementation. As described in more detail in section 4, project progress was adversely affected by administrative weakness and lengthy procedures. Persistent delays continuing after extension of the project closing date led to the cancellation of the SHF portion of the monitoring system covering about 10 percent of the spectrum. At closure, the monitoring system covering the High Frequency (HF), Very High Frequency (VHF) and Ultra High Frequency (UHF) bands was not fully functional and tested[10], but at the time of the IEG mission the system was commissioned and in use by WMO, and some problems of significant local interference experienced initially had been resolved. Nevertheless, the delays caused a longer period of time and inconvenience during which an efficient monitoring capability was lacking. Inadequate staffing was also reported from the

[10] For example, the antenna towers at two sites, Goa and Jallandhar, had been delayed due to land disputes and the mobile units had not been fully deployed.

regional offices which on occasion affected monitoring coverage[11]. Training had generally been conducted successfully in tandem with the equipment roll out. The Indian manufactured vans housing the mobile monitoring units were also cumbersome and may face some restrictions when used in hilly areas or on narrow roads.

6.6 The ASMS was installed and partially automated. Full automation as originally envisaged had not yet occurred,[12] but the time taken to assign frequencies for earmarked bands had fallen considerably (usually within the range of 16-25 days), but not to the ambitious target of 15 days set as a target in the PAD. Approval of less agencies is now required and in some instances assent is assumed if no objection is received within a month of the application. SACFA has permitted more exemptions in respect of site clearance, and BSNL is no longer on the SACFA board since it cannot be both a referee and player. Applicants are also now informed immediately if their application is rejected.

6.7 It was intended that a National Frequency Allocation Plan would be published every two years and this was achieved in 2000, 2002 and 2004. However, the plan drafted in 2005 had not yet been finalized in February 2008 at the time of the IEG mission.

TRAI/TDSAT

Telecom Dispute Settlements and Appellate Tribunal

6.8 The recently established agency TDSAT was required to build its capacity, learn from other practices around the world, and raise awareness of its work program and activities with its users. Through the technical assistance under the project a local area network (LAN-based) reference library was set up and a website established which gave access to consumers on all cases that had been considered.

6.9 Legal precedents are ascertainable by the public in respect of issues scheduled to come before the Tribunal. Decisions of the Tribunal are posted within 30 minutes of the verdict. Seminars, study tours and training programs have also been conducted for its staff and to create awareness by consumers. The impact of regional seminars has been directly reflected in the number of cases and references received by TDSAT (up by between 40 and 60 percent). Exposure to international experience has also led TDSAT to propose improvements to legal procedures and dispute resolution in a rapidly changing regulatory environment, while regulatory risk has been reduced through the speedy handling of appeals. During the final year of project implementation the processing rate for cases received was recorded as above 90 percent for the year.

---

[11] WPC (including WMO) has a total of about 400 sanctioned technical staff positions, of which about 30 percent remain vacant. Staff numbers do not reflect the enormous growth in spectrum-based services in India.
[12] Some key agencies such as defence and aviation still have to formally agree to the assigned frequencies and in this sense full automation has still not occurred.

Telecom Regulatory Authority of India

6.10 From its inception TRAI has played a key role in helping the telecom sector to transform to the needs of a modern India and cope with the phenomenal growth of telecom services. It has also supported the sector in increasing the availability and reach of especially mobile and internet services including the rural areas. The project supported 33 consultancy appointments and 32 training activities or programs. This has enabled a rapid expansion of TRAI's ability to play a catalytic role in reform and to shape the environment for competition and private investment. This view IEG confirmed was supported by associations such as the Association of United Telecom Service Providers of India.

6.11 A comprehensive list of consultancy studies and their results was provided in an Annex to the ICR (reproduced in this PPAR as Annex B). IEG commends the way in which these assignments were linked to outcomes. Three typical examples (out of 33) are given below:

- *Study on the cost of capital:* The study was carried out to decide the rates of return to be given while finalizing pricing and interconnect user charges for the telecom industry as well as the quantum of Access Deficit Charges. The inputs received from the study have been used to standardize the methodology to estimate the cost of capital.

- *Consultancy and Workshop on Broadband Technologies:* A detailed recommendation on growth of internet and broadband was sent to GOI, which issued the GOI Broadband Policy of 2004.

- *Consultancy for Advising TRAI on Cable TV Services:* The study helped TRAI to formulate its recommendations on issues relating to broadcasting and cable services.

6.12 Arguably, this component had the most impact in terms of the PDO. TRAI clearly played an important and catalytic role in the reform and transformation of the telecom sector and is generally regarded as a very successful agency.

6.13 Overall, taking the outcome of the five subcomponents of varying size into account, their respective impacts need to be weighed-up carefully. The equipment-intensive WPC component, for example, was not fully completed even at the time of the IEG mission, but both the ASMS and the NSMS are now functioning systems and clearly credit needs to be given for this. The technical assistance funds aimed at capacity building have also been well utilized and have made a significant difference in the sector. The Bank clearly also added value with impartial advice and through its international experience.

7. Ratings

Relevance

7.1 As indicated in paragraph 3.3 the project was substantially relevant taking into account both the CAS and GOI strategies for the telecom sector. Officials in TRAI and

TDSAT in particular were very complimentary about the level and timeliness of the Bank support. Institution building was an important factor in enabling the GOI's telecom policy to be realized. The project objectives were therefore highly relevant. Project design was modestly relevant in that insufficient attention was given to M&E and the issue of attribution. Overall, relevance is rated as *substantial.*

Efficacy

7.2 The over-arching PDO has two elements, namely, promoting private investment and competition in India's telecom sector and, strengthening the policy and regulatory environment.

7.3 Liberalization of the telecom sector has led to many public and private firms competing and investing (element 1) in the Indian telecoms market. BSNL, Bharti Airtel Ltd, Reliance Communications Ltd and Vides Sanchar Nigam Ltd were all issued licenses for inter-circle domestic long distance service during project implementation. Relative freedom of entry into the market has resulted in there now being 7 wireline, 12 wireless, 13 (main) broadband, and 32 internet service providers. The market, however, is dominated by a few large firms. BSNL still provides 83 percent of the wireline services, while 86 percent of internet services are provided by the top five operators.[13] Nevertheless the market is vibrant and fiercely competitive, especially in respect of wireless providers. The wireline services are considered less lucrative and therefore fewer firms are willing to enter this market. Table 7.1 below also shows the phenomenal growth in the sector over the last ten years.

Table 7.1 Growth of Indian Telecom Sector 1997-2007

ITEM NAME	1997	2002	2007
Wireline subscribers (millions)	14.54	38.29	40.75
Wireless subscribers (millions)	0.34	6.68	165.11
Total of telephone subscribers (millions)	14.88	44.97	205.86
Teledensity (%)	1.56	4.29	18.23
Internet subscribers (millions)	0.09	3.42	40.57
Broadband subscribers (millions)	-	-	2.33
Per min call charges - local (INR)	16.80	3.09	1.00
Per min call charges – STD (INR)	30.00	9.80	2.40
Per min call charges – INT (INR)	75.00	40.80	6.40
Min of use (per wireless subscriber per month)	-	215	471
Foreign Direct Investment (FDI) in telecom (million INR)	22,328	95,621	118,088

Source: TRAI. Data as of March 31, 2007.

[13] Data from TRAI Performance Indicators Report, Jan 1, 2008.

7.4 The number of wireless subscribers has grown almost exponentially, while the number of fixed wireline subscribers has peaked. In the nine month period that has occurred since the figures given in the table above, the number of fixed wireline subscribers has actually fallen to 39.58 million. FDI in the telecom sector has grown more than five times over the decade, while the cost of a local phone call has fallen from nearly 17 INR to just one INR per minute, though this is also partly due to technological change too.

7.5 While a number of factors have contributed to the huge expansion of the sector, TRAI has linked major milestones to the rate of growth including permitting tariff reductions, the introduction of a unified access regime, lowering access deficit charges, allowing cheaper handsets to be sold, and allowing cheaper intra-network calls. Most of these measures resulted after multiple consultation papers that were funded under the Bank project. IEG contends that while the effect of the technical assistance (and Bank technical advice) was often not readily measurable, TRAI, other agencies, and their users were very positive about the support given from the project and indicated that the project did play a substantial role. Efficacy is rated substantial for PDO, element 1.

7.6 On the regulatory side (element 2) a number of issues were analyzed with a view to improving the policy and regulatory environment in the sector. These included policy guidelines and rulings on specific problems including spectrum management, licensing and inter-connection issues, as well as regulations pertaining to broadcasting and cable services. Much was done to improve awareness of issues by the public including seminars and workshops, but also through the development of better websites, performance indicators, and appropriate training. TRAI has produced a handbook for consumers which outlines the rights of the consumer and includes a charter for the provision of telecom services. There is also a list of consumer organizations registered with TRAI. The ability of the DOT to manage the allocation of radio frequencies and ensure compliance with laid-down standards has also improved, despite initial delays. The investments in capacity building were all carried out according to schedule and staff interviewed confirmed that the training was vital to enable them to fulfill their functions in a fast-changing environment. Efficacy is rated substantial for PDO, element 2, and also *substantial* overall.

Efficiency

7.7 It is on the efficiency side where the project had the most shortcomings. Project delays in systems installation led to the benefits of the new systems not being fully realized until over three years after the original closing date of the project. The SHF portion of the project was also cancelled and while at this time only ten percent of interference complaints arise from use of the spectrum above the 3 GHz band, this percentage may grow in the future. It was not possible to calculate an economic rate of return for this project, because of a lack of suitable data and because of attribution issues, but there is no doubt that both the above factors would have negatively affected the benefit stream and added to the costs. In addition, there is the fact that too much capital was tied-up in the initial capital estimates for the project, and in the end less than half of the original project cost was actually disbursed. Efficiency is rated *modest.*

Overall Rating

7.8 Taking into account the progress towards achieving the PDO and the assessments of relevance, efficacy and efficiency, IEG's overall rating is *moderately satisfactory.* The shortcomings in respect of the equipment component, which was by far the largest in the project, were too important to permit a fully satisfactory rating.

Risk to Development Outcome

7.9 The capacity building initiative in this project has helped to enhance the capacity of agencies that are well regarded and indeed have an international reputation. TRAI and TDSAT receive visits from other developing country agencies eager to learn from the Indian experience. Performance monitoring, dispute settlement and public awareness aspects in the sector have been particularly well handled. The DOT has been able to make an important contribution at the working groups of the ITU. Sector reform has received a substantial overhaul during the last five years and is well set to cope with a technological environment of constant change.

7.10 The ASMS and NSMS are functioning adequately, but have not yet reached their full potential, since the former is not yet fully automated as originally envisaged and the latter lacks the capability to monitor the SHF part of the spectrum. There are also still problems in the allocation of spectrum between the public and private sectors and an overall spectrum management plan is lacking. This is also reflected in the lack of priority given to publishing the NFAP. Some concerns are evident due to a lack of suitable qualified staff in the DOT, but this is part of a generic problem in the Indian civil service which the GOI is addressing separately. On balance, India is on track to develop into a dynamic and competitive communication and technology market in Asia, and the risk to development outcome of this project failing is seen as *negligible to low.*

Bank Performance

7.11 The Bank did a good job in convincing GOI to expand the project design to give general institutional support to the sector reforms. The Bank's international experience and impartial advice certainly added value to the rollout of the training and other technical assistance and in particular helped build the reputation and credibility of TRAI. It also supervised the capacity building component well and gave specific advice at GOI's request which it received very positively. The Bank showed flexibility in a fast-changing environment. For example, when TRAI's role was extended to include broadcasting signals and the authority had an urgent need to build capacity in that domain, the Bank was able to accommodate this addition swiftly.

7.12 However, the cost estimation for the project was seriously over-valued despite the use of experienced experts in determining "appropriate" amounts. More thought could have gone into the monitoring indicators specified, and the implementation risks, though properly identified, were under-estimated. Quality at entry was moderately satisfactory. The supervision problems of the equipment procurement, installation and commissioning were well-documented and it is clear that extensive and repeated discussion took place concerning

the inadequacy of the PIU and the need to retain an experienced project manager. But the discussions did little to change the situation on the ground and interventions at a higher management level by the Bank do not appear to have been effective.[14] Quality of supervision is rated as moderately satisfactory and overall Bank performance is deemed *moderately satisfactory.*

Borrower Performance

7.13 *Government.* The Borrower participated with commitment during preparation, but loan negotiations were delayed by around eight months in the appointment of consultants to assist WPC to prepare bidding documents. This delay was due to difficulty in securing GOI approval for the selection of consultants under Bank guidelines, which differ from GOI's own procedures. However, given the large portfolio of Bank-supported projects being handled by the GOI, this delay is surprising. Some of the later difficulties experienced during implementation could also have been unblocked with more proactive action from government. Moderately satisfactory.

7.14 *Implementing Agencies.* The performance of the agencies in respect of capacity building was very positive and few significant problems were encountered. However, the WPC component experienced considerable delays because of problems with contractors, and a lack of empowerment and decision-making capacity in the PIU. Conversely, the PIU could have played a more proactive role in bringing to management's attention issues that needed urgent resolution. Moderately satisfactory. The overall Borrower performance is rated *moderately satisfactory.*

8. Lessons

8.1 A number of important lessons can be gleaned from the design and implementation of this project:

- When the experience of the implementing agency in managing projects is limited, and especially when such projects are complex, it is essential to appoint a project management consultant early-on to compensate for any gaps in expertise. Most of the difficulties experienced in the implementation of the Telecom Sector Reform Project, involving the modernization of the country's radio frequency and licensing system, were attributable to inability to take decisions and lack of capacity to find solutions to problems;

- In a sector where technology advancement is a key driver of change, it is necessary to build sufficient flexibility and foresight into the projects. In the India Telecom Reform Project, flexibility allowed for project realignment during implementation, when required, thus facilitating a redefinition of needs. An example of this was an unexpected need to gain an understanding of television broadcasting signal technology. However, with regard to the need for foresight, a better understanding of

[14] On most missions the issues were raised at least at Additional Secretary level

the relationship between rapid technological change and project costs could have avoided a serious overestimate of equipment costs, and this would have saved US$ 331,000 in front-end fees, while the Bank would have better utilized part of its loan. Obsolescence also occurs more quickly in the telecommunications field and so it is critical to avoid delays in project completion;

- Investing in capacity building and institutional development is critical to ensuring effective project implementation and project sustainability. This was a crucial aspect of strengthening the regulatory and dispute settlement framework in India. However, it is equally important in ensuring operational effectiveness, especially for equipment design, procurement and installation. Such investments need to be supported by clear leadership and a willingness to implement reforms at a senior level. Sometimes the prevailing organizational and business culture can impede satisfactory progress due to competing priorities and agendas. When such a serious blockage is encountered the issue should be elevated to an appropriate level of decision-making and, if necessary, pursued on a programmatic or multi agency basis.

Annex A. Basic Data Sheet

TELECOMMUNICATIONS SECTOR REFORM TECHNICAL ASSISTANCE PROJECT (LOAN 4555-IN)

Key Project Data *(amounts in US$ million)*

	Appraisal estimate	*Actual or current estimate*	*Actual as % of appraisal estimate*
Total project costs	72.00	33.00	45.8
Loan amount	62.00	28.00	45.2
Cofinancing	-	-	-
Cancellation	-	33.38	-

Project Dates

	Original	*Actual*
Negotiations	04/24/2000	04/24/2000
Board approval	06/06/2000	06/06/2000
Signing	08/11/2000	08/11/2000
Effectiveness	08/29/2000	06/29/2000
Closing date	12/31/2004	03/31/2006

Staff Inputs *(staff weeks)*

	Actual/Latest Estimate	
	No. Staff weeks	**US$ ('000)**
Identification/Preparation	12.2	94
Appraisal/Negotiation	56.0	353
Supervision	56.0	557
ICR	8.3	72
Total	133.0	1,076

Mission Data

	Date (month/year)	No. of Persons and Specialty (e.g. 2 Economists, 1 FMS, etc)		Performance Rating	
				Implement. Progress	Develop. Object.
Identification/ Preparation	Dec. 1997	2	1 Sr. Private Sector Development Specialist, 1Economist		
	Apr. 1998	3	1 Economist, 1 Senior Financial Analyst, 1 Private Consultant		
	Oct. 1998 (pre-appraisal)	6	1 Sr. Financial Analyst, 1 Pr. Telecoms Engineer, 1 Procurement Analyst, 1 Financial Management Specialist, 1 Pr. Financial Analyst		
Appraisal/ Negotiation	Mar. 1999	8	1 Sr. Financial Analyst, 1 Pr. Telecoms Policy Specialist, 1 Pr. Telecoms Engineer, 1 Sr. Procurement Specialist, 1 Financial Management Specialist, 1 Telecoms Advisor, 1 Economist, 1 Director		
	Jan-Feb 2000	3	1 Sr. Financial Analyst, 1 Procurement Analyst, 1 Sr. Procurement Specialist	S	S
Supervision	Sept-Oct 2000	3	1 Pr. Telecoms Policy Specialist, 1 Senior Financial Analyst, 1 Consultant/Engineer	S	S
	Mar-Apr.2001	1	1 Consultant/Engineer	S	S
	Sept. 2001	2	1 Principal Telecom Specialist, 1 Principal Telecom Engineer	S	S
	Nov. 2002	2	1 Lead Telecom Specialist, 1 consultant	U	S
	May 2003	1	1 Telecom Engineer	S	S
	Sept. 2003	3	1 Lead Telecom Specialist, 1 Consultant/Engineer, 1 Senior Counsel	S	S
	Dec. 2003	1	1 Consultant/Engineer	S	S
	Mar. 2004	2	1 Lead Telecom Specialist, 1 Consultant/Engineer	S	S
	Sept-Oct. 2004	3	1 Lead Telecom Specialist, 1 Consultant/Telecom Engineer, 1 Lead Operations Officer	S	S

	Date (month/year)	*No. of Persons and Specialty (e.g. 2 Economists, 1 FMS, etc)*		*Performance Rating* *Implement. Progress*	*Develop. Object.*
	Mar 2005	3	1 Lead Telecom Specialist, 1 Consultant/Telecom Engineer, 1 Sr. ICT Policy Specialist	S	S
	Oct 2005	4	1 Lead Telecom Specialist, 1 Consultant/Telecom Engineer, 1 Lead Operations Officer, 1 Sr. ICT Policy Specialist	U	S
ICR	Mar 2006	3	1 Lead Telecom Specialist, 1 Sr. ICT Policy Specialist		
	May 2006	3	1 Lead Telecom Specialist, 1 Sr. ICT Policy Specialist, 1 ICT Policy Specialist		

Annex B - Consultancies Supervised by TRAI under the World Bank Loan (No. 4555-IN) and their Utilization

	Consultancy including Workshops & Seminars	**Utilization**
1.	Study on Accounting Separation (Consultant-M/s A.F. Ferguson)	Study was utilized for finalizing the Accounting Separation Regulation for telecommunication services
2.	Study on the Cost of Capital (Consultant-M/s CRISIL)	Study was carried out to decide the rates of return to be used while finalizing pricing and Interconnect User Charges (IUC) for the telecom industry and the quantum of Access Deficit Charges (ADC). The inputs received through the study have been used to standardize the methodology to estimate the cost of capital.
3.	Study on the Quality of Service of Basic and Cellular Services (Consultant-IMRB, New Delhi)	Study was to assist TRAI in its function to monitor the quality of service provided by the service providers and to ensure the quality of service. The consultant carried out a detailed objective assessment of the quality service provided by the Basic and Cellular Service Providers against the parameters laid down in the Quality of Service Regulation for a period of four quarters (October 2001 to September, 2002) and also the subjective assessment of the customer satisfaction survey.
4.	Short consultancy on estimation of ADC/IUC based on forward looking LRIC and other models (Consultant-M/s ANALYSYS Consulting Ltd., U.K)	Through this study, the consultants submitted a software as well as a model for calculation of IUC/ADC in India, which was utilized for finalizing the IUC Regulation.
5.	Short consultancy on Implementation of Interconnection Usage Charge (IUC) Regime in India (Consultant – Mr. Edgardo Sepulveda, Canada).	The report was utilized for finalizing the IUC Regulation.
6.	Competition Seminar – Seminar was organized on 6-7, October, 2003 by TERI on behalf of TRAI	Utilized for framing the recommendation on DLC and IPLC competition issues and access to landing stations.
7.	Mergers & Acquisitions in the Telecom Industry: Lessons from other countries (Consultant-M/s ICRA Advisory Services Ltd.)	The report was utilized for finalizing the Recommendations on Mergers and Acquisitions in the telecom industry in India.

8.	Consultancy and Workshop on Broadband Technologies and related regulatory issues-Workshop was organized by ICRIER on behalf of TRAI on 29th and 30th January 2004. (Consultant: Mr. Christopher Stanford Beale).	A detailed recommendation on Growth of Internet and Broadband was sent to the Government and the Government issued the Broadband Policy, 2004.
9.	Consultancy for advising TRAI to finalize Recommendations/Regulations/Tariff Orders on Cable TV Services (Consultant-M/s Media Partners Asia Ltd).	The study helped TRAI to formulate its recommendations on issues relating to broadcasting and distribution of TV channels.
10.	Study on the assessment of monthly cable rate and revenue share arrangement between Broadcasters, MSOs and local cable operators (Consultant – M/s IMRB, New Delhi)	In the absence of structured data, this limited survey helped TRAI to focus on relevant issues relating to Broadcasting and Cable Services.
11.	Follow-up Study to finalize Recommendations/Regulations/Tariff Orders on Cable TV Services (Consultant-M/s Media Partners Asia Ltd.)	The study helped to formulate TRAI's recommendations on issues relating to broadcasting and distribution of TV channels.
12.	Study on Guidelines for Competition in a Multi-service, Multi-operator Network (Consultant – M/s Mc Kinsey & Co)	The report provides a comprehensive framework pertaining to various competition-related issues relevant for India. The case studies/references given in the report are used to understand the International Practices on a number of regulatory issues.
13.	Study on Spectrum Policy: Efficient Utilization, Management and Pricing (Consultant-M/s Aegis System Ltd., U.K.)	Study was utilized for finalizing the detailed recommendations on Spectrum Issues.
14.	Development of User Specific Application Software for comparison of Tariff plans in telephony in India – (Consultant-M/s TERI) Phase – 1 & 2.	Results of the analysis on comparison of Tariff Plans given by the consultant were posted on TRAI's website for information of the consumers of Mumbai and Delhi.
15.	Study on Quality of Service of Basic and Cellular Services (Consultant – M/s IMRB, New Delhi)	Study was to assist TRAI in its function to monitor the quality of service provided by the service providers and to assure the quality of service. The consultant carried out a detailed objective assessment of the quality service provided by the Basic and Cellular Service Providers against the parameters laid down in the Quality of Service Regulation for a period of four quarters (October, 2003 to September, 2004) and also the subjective assessment of customer satisfactory survey.
16.	Implementation of ISO 9001:2000 Quality Management: (Cons. RITES)	TRAI obtained ISO 9001: 2000 certification on its functioning, procedures and processes.

17,	Number Portability (Consultant – M/s OVUM, UK)	Consultant's report was utilized for finalizing Recommendations on Mobile Number Portability which have been sent to the Government.
18.	Directory Enquiry (Consultant – M/s K.M.D. Consultants)	Study report was utilized for finalizing Recommendations on publication of Telephone Directory and Directory Enquiry Services already sent to the Government.
19.	Study on growth of Internet (Consultant – Prof. Dheeraj Sanghi, IIT, Kanpur)	A detailed recommendation on growth of Internet and Broadband was sent to the Government and the Government issued the Broadband Policy, 2004.
20.	Study of issues relating to Migration from Ipv4 to Ipv6 in the country (Consultant – Mr. Latif Ladid, Luxemburg)	A Detailed Recommendation on Migration from Ipv4 to Ipv6 was sent to the Government.
21.	Study on Auditing of Billing and Charging (Consultant – M/s TUV Suddeutshland India Pvt. Ltd., jointly with M/s BABT, UK)	Consultant's report was utilized for finalizing Regulation on Code of Practice for Metering and Billing Accuracy.
22.	Short Consultancy on Spectrum Policy (2nd Study): (Consultant-M/s Aegis System Ltd. UK)	Study was utilized for finalizing the detailed recommendations on Spectrum Issues.
23.	International Trend on Digitalization of Cable Network (Consultant-M/s Media Partners Asia Ltd.)	Report was utilized for finalizing TRAI's Recommendations on Digitalization of Cable TV.
24.	Digitalization of Cable Network (Technical and Costing) – (Consultant-M/s Ernst & Young)	Report was utilized for finalizing TRAI's Recommendations on Digitalization of Cable TV.
25.	International Trend on Satellite Radio – (Consultant – M/s Telecom Strategies Inc. Ltd., USA)	Inputs received through the study were utilized for finalizing TRAI's Recommendations on Satellite Radio.
26.	Short training-cum-consultancy on 'Study of Mobile Services Growth in China' (Consultant – Mr. Duncan Clerk)	Study was utilized to obtain inputs on growth of mobile services in China for comparative analysis with the growth trend in cellular services in India.
27.	Short training-cum-consultancy on Spectrum related issues (Consultant – Mr. David Sallant)	Study was utilized for finalizing the detailed recommendations on Spectrum Issues.
28.	Short Consultancy on Study of IPLC/DLC in India (Consultant – M/s Ernst & Young)	The report of the study as given by the Consultant was used to Benchmark the tariffs obtained in the Key Asia-Pacific markets in respect of IPLC & DLC. Further, the International Regulatory Practices governing Regulation of IPLC & DLC sector as given in the report was utilized in the framing of Tariff Policy for these services in India.
29.	Regulatory issues relating to Access Service Provision by Cable T.V. Operators (Consultant- Mr. Knud Eric Skouby of Denmark)	Study was conducted to assess the suitability of Cable TV network for voice telephony. Consultant recommended that the existing Cable TV network in India is not suitable for voice telephony. On the basis of Consultant's report and its own analysis, the Authority decided not to make any recommendation on the subject at this time.

30.	Licensing for Converged Services (Consultant – Mr. Chris Zull of Australia)	Study was conducted in the context of the Draft Convergence Bill, which was to be presented to the Parliament. The main features of the report were forwarded to the Government. In addition, the report has also been utilized in framing recommendations on Unified Licensing.
31.	Study on Affordability of Telecommunication Services (Consultant – NCAER, New Delhi)	Report of the Consultant was utilized for Tariff Rebalancing exercise conducted by TRAI.
32.	Study on Interconnection Benchmarking Rates for India (Consultant – M/s OVUM, U.K.)	Objective of the study was to gather international experience on interconnection benchmarking rates in order to work out an appropriate rate for India.

Source: TRAI

Annex C. Borrower Comments

D.O.No.7/1/97-FB-VI

सत्यमेव जयते

Smt. Aparna Sinha
Deputy Director (FB)
Tel:23093404
Fax:23092477

भारत सरकार
वित्त मंत्रालय
आर्थिक कार्य विभाग
Government of India (Bharat Sarkar)
Ministry of Finance (Vitta Mantralaya)
Department of Economic Affairs (Arthik Karya Vibhag)

नई दिल्ली/New Delhi, **29th September, 2008**

Dear Ms. Huppi,

Please refer to World Bank's letter dated 3rd June 2008 seeking GOI comments on the draft Project Performance Assessment Report – World Bank assisted Telecom Sector Reform TA Project.

This Department had taken up the matter with Telecom Regulatory Authority of India (TRAI) and Ministry of Communication & Information Technology (MoC&IT). The comments received from TRAI and MoC&IT on the said draft report are enclosed for your consideration and for appropriate inclusion of the same in the final report.

With regards,

Yours sincerely,

Aparna

(Aparna Sinha)

Encl: A/A

Ms. Monika Huppi
Manager
Sector Evaluation Division
Independent Evaluation Group
The World Bank,
1818 H Street N.W.,
Washington D.C. 20433 U.S.A.
Through New Delhi Office.

CD'S Incoming Mail	
Date:	Oct. 1
For action	Huppi
cc:	Tenzin D. Norbhu
	CD's file

भारतीय दूरसंचार विनियामक प्राधिकरण
महानगर दूरसंचार भवन, जवाहर लाल नेहरु मार्ग,
(पुराना मिन्टो रोड), नई दिल्ली-110002

सत्यमेव जयते

TELECOM REGULATORY AUTHORITY OF INDIA
Mahanagar Doorsanchar Bhawan, Jawahar Lal Nehru Marg,
(Old Minto Road), New Delhi-110002
Fax : 91-11-23213294

02-1/2008-Coord **Dated : 04.07.2008**

To,
The Deputy Director (FB)
Department of Economic Affairs
(Fund Bank-VI)
Ministry of Finance,
North Block, New Delhi

Sir,

Subject : Telecommunications Sector Reform Technical Assistance Project L.N.4555-IN Reg - Comments/views of DoT on the draft project performance assessment report

With reference to Department of Economic Affairs O.M. No.7/1/97-FB.VI dated 9th June 2008, I am directed to inform that the observation in respect of TRAI made in the Draft Project Performance Assessment Report is on the line of the Implementation Completion Report and we have no further comments to offer on the subject.

Yours faithfully,

(D.K.Sharma)
Sr.Research Officer (coord)

Tel No. 23231929

853/FB-VI/08
16/7/08

डा० सं० 2073
11.7.08

No. 8/39/2005-Restg.
Ministry of Communications and IT
Department of Telecommunications
20, Ashoka Road, Sanchar Bhawan, New Delhi.

Dated: 19th September, 2008

OFFICE MEMORANDUM

Subject: India – Telecom Sector Reform TA project – Comments on draft Project Performance Assessment Mission regarding.

The undersigned is directed to refer to your Office OM No. 7/1/97-FB-VI dated 9th June 2008 on the above subject and to convey the comments of the Department in the enclosed Annexure on some specific Paras of the draft Project Performance Assessment Report of Independent Evaluation Group (IEG), World Bank on "India – Telecommunications Sector Reform Technical Assistance Project". The Department agrees with remaining paras of the above said draft report.

Enclosure: As above.

(S.P.Sharma)
Under Secretary (Restg.)
Ph: 23372068/ FAX: 23372499

Ministry of Finance,
Department of Economic Affairs
(Shri C. Vanlalramsanga, DD (FB)
North Block, New Delhi.

887

ANNEXURE

Comments of Department of Telecom on draft Project Performance Assessment Report of Independent Evaluation Group, World Bank on "India – Telecom Sector Reform Technical Assistance Project"

Para 4.5 Consultants were hired in the project as and when it was required.

Para 4.6 WPC Wing of the Department had taken advice from PMC on each and every issue during their tenure under the project.

Para 4.8 Contractors could not complete the works on time, due which loan amount could not be fully utilized.

Para 6.5 Report mentioned that persistent delays continuing after extension of the project closing date led to the cancellation of the SHF part of the project has been proposed for cancellation as the Contractors are unable to meet technical specifications.

Para 6.6 Report stated that Automated Spectrum Management System (ASMS) was installed and partially automated. This is not correct. The ASMS has been made fully operational and is in use.

Para 6.7 The draft NFAP 2005 is currently being finalized taking into account the recommendation of ITU WRC – 2007.

Para 7.10 Due to inadequate staffing, the full potential of ASMS and NSMS could not be exploited.

***