



Report Number: ICRR0021643

## 1. Project Data

**Project ID**

P107782

**Project Name**

PG: Rural Communications Project

**Country**

Papua New Guinea

**Practice Area(Lead)**

Digital Development

**L/C/TF Number(s)**

IDA-47910

**Closing Date (Original)**

31-Aug-2015

**Total Project Cost (USD)**

14,095,014.76

**Bank Approval Date**

22-Jul-2010

**Closing Date (Actual)**

31-Aug-2018

**IBRD/IDA (USD)**
**Grants (USD)**

Original Commitment

15,000,000.00

0.00

Revised Commitment

15,000,000.00

0.00

Actual

14,095,014.76

0.00

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## 2. Project Objectives and Components

### a. Objectives

As per the Financing Agreement on page 5, the objective of the project was "to improve access to telecommunications infrastructure and services in rural and remote areas of the Recipient's territory". The statement of the project development objective (PDO) on page 7 of the project appraisal document (PAD) was identical in substance, and was not revised during project implementation.



**b. Were the project objectives/key associated outcome targets revised during implementation?**

No

**c. Will a split evaluation be undertaken?**

No

**d. Components**

The project had three components, each of which had minor revisions during the August 11, 2014 restructuring.

**Component 1: Technical Assistance for National ICT Authority (NICTA) (cost at appraisal US\$1.0 million, revised cost US\$1.6 million, and actual cost US\$1.30 million).** This component aimed to develop regulations and procedures, prepare Universal Access Service (UAS) demonstration projects and provide advisory services as delineated below:

(a) **Development of UAS Regulations and Operational Procedures:** Project resources were to support: (i) the preparation of regulations and procedures for the Act including the accounting and reporting procedures for the financial management of the UAS Fund; (ii) the establishment and operation of the UAS Secretariat and carrying out of a study tour to countries that have practical experience in the financing of universal access systems; and (iii) the upgrading the Recipient's existing radio spectrum management software into a geographic information system for the UAS Secretariat.

(b) **UAS-financed Projects Preparation and Verification:** Project resources were intended to fund technical assistance needed to oversee the implementation of the demonstration projects, and to prepare new UAS projects, including demand analysis, preparation of projects for financing by the UAS Fund, financial modeling and preparation of tender documentation.

(c) **Regulatory Advisory Assistance:** Project resources were to support: (i) the provision of technical assistance needed to strengthen the competitiveness of the telecommunications market for the medium-term and to address emerging challenges in the sector including, inter alia: studies on spectrum management, licensing implementation, next-generation regulatory issues such as passive infrastructure-sharing, number portability, quality of service, and additional competition in wholesale markets; and (ii) carrying out of study visits and training exchanges with other regulators, particularly those implementing universal service programs.

**Revisions to Component 1:** Additional budget was allocated to reflect the additional demand for regulatory advisory services.

**Component 2: UAS Demonstration Projects (cost at appraisal US\$13.5 million, revised cost US\$12.1 million, actual cost US\$11.8 million).** This component intended to support the initiation and completion of demonstration projects as follows: (i) carrying out two demonstration projects for telecommunications network expansion in two geographically distinct locations, namely Chimbu and East Sepik.; and (ii) carrying out demonstration project for the establishment of internet service in about sixty district centers in major geographic regions of the Recipient's territory for operation of internet cafés by subcontractors.



**Revisions to Component 2:** The scope of the UAS demonstration project for internet access was changed from public access point (internet cafe) to mobile network upgrade and the original budget was reduced. This was mainly because of the developments in Papua New Guinea's (PNG) 's ICT sector since project preparation.

**Component 3: Project Management (cost at appraisal US\$0.5 million, revised cost US\$1.30 million, and actual cost of about US\$1.00 million).** This component aimed to strengthen the capacity of the Department of Communication and Information (DCI) through the provision of advisory services, training and support for project coordination, procurement, financial management, telecommunications technical support and supervision.

**Revisions to Component 3.** This component was split in two sub-components as follows: (i) Technical Assistance for DCI, and (ii) Project Management. This split was done because the advisory service for ICT policy development remained with DCI, while the official project management was transferred from DCI to the National ICT Authority (NICTA), with the relevant resources. The budget was increased to reflect additional demand for policy advisory services.

**e. Comments on Project Cost, Financing, Borrower Contribution, and Dates**

**Cost:** The appraisal estimate was US\$15.0 million, and the actual project cost amounted to US\$14.1 million.

**Financing:** The project was funded by an IDA credit, with appraisal amount of US\$15.0 million, and the actual amount of US\$14.1 million.

**Co-financing:** The project was cofinanced by the Asian Development Bank, US\$9.7 million.

A number of external partners supported the project activities by providing technical capacity building and analytical work. These partners included the Australian Agency for International Development (AusAID), the Asia-Pacific Telecommunity, the International Telecommunications Union, the Pacific Islands Forum Secretariat, the Pacific Islands Telecommunications Association, the Pacific Region Infrastructure Facility, and the South Pacific Commission. This was through parallel financing.

**Borrower Contribution:** There was no planned borrower contribution, and none occurred during implementation.

**Dates:** The project was approved on July 22, 2010, and made effective on March 7, 2011. The project was closed on August 31, 2018, three years after the original closing date.

The project was restructured three times:

(i) on June 17, 2013 to incorporate changes in the Results Framework, in the components and cost, and in the disbursements arrangements;

(ii) on August 11, 2014 changes were made regarding the Implementing Agency, the Results Framework, the project's components and cost, the credit closing date, the reallocation between



disbursement categories, the fiduciary and institutional arrangements, the procurement, and the implementation schedule; and

(iii) on August 14, 2017 to integrate further changes in the results framework, in the credit closing date, and in the implementation schedule.

### 3. Relevance of Objectives

#### Rationale

**Alignment with the country's priorities.** The 2050 Government's Vision aims greater attention to rural and balanced regional development through effective service delivery. Under this vision, the target was to increase communication access from 10 percent to 100 percent of the population (PNG Vision 2050, p.8). The Government's Medium-Term Development Strategy 2005-10, which provided the guiding framework for the Government's expenditure program, identified more affordable, reliable, and readily-available information and communications technology (ICT) infrastructure and services as necessary tools for economic growth and social development. The above strategic priorities were consistent with the project's objective of improving access to telecommunications infrastructure and services in rural and remote areas of the country.

**Alignment with the Bank's strategy.** The current FY 2013-16 World Bank Country Partnership Strategy (CPS) for PNG was extended by two years to align it with the Medium-term Development Strategy, and included this project as the anchor for Pillar 1 of the CPS which aimed at increasing coverage of rural areas through mobile networks and enabling increased use of ICT for transparency and accountability in monitoring basic service delivery.

While there was a consistency between the project activities, the Government's priorities and the World Bank's strategy for the country, the scope of the project and other implementation modalities (the PIU and the required technical capacity) were refined during implementation through the three project restructurings. Overall, the project's objectives at closure were substantially relevant.

#### Rating

Substantial

### 4. Achievement of Objectives (Efficacy)

#### OBJECTIVE 1 Objective



To improve access to telecommunications infrastructure and services in rural and remote areas of the Recipient's territory.

### **Rationale**

**Theory of change.** The theory of change is sound and illustrates logical links between the project's activities, outputs, and desired outcomes. For instance, project activities such as the establishment of 2G and 3G cell towers, UAS demonstration projects for the provision of voice and internet services in rural areas, and the technical assistance for developing UAS regulations and supporting NICTA with regulatory assistance (spectrum management, licensing implementation, infrastructure sharing, quality of service, and additional competition in wholesale markets) were causally linked to improved PNG access to telecommunications infrastructure and services in rural and remote areas.

Key project outputs and outcomes are delineated below:

### **Outputs:**

(i) The project helped to establish 2G cell towers in 59 sites (greenfield sites) and 3G cell towers in 120 sites (upgraded from 2G to 3G) in the four regions of PNG;

(ii) Two UAS demonstration projects for the provision of voice and internet service in rural areas were supported under the UAS scheme with the least-cost subsidy mechanism. The first UAS demonstration project for voice service installed mobile base stations in 59 sites across PNG, and the second UAS demonstration project for a mobile network upgrade provided mobile internet coverage to 1.12 million people who previously did not have internet access;

(iii) The percentage of 89 district centers with Internet access reached 92 percent, against a target of 70 percent, and a baseline of 0; and the target of successful demonstration projects undertaken by UAS Secretariat reached the number of 3, against a target of 1, and a baseline of 0;

(iv) The staff from NICTA and the Department of Communication and Information (DCI) benefited from training programs in areas including spectrum management, e-Government, and cyber-security; and

(v) On the contrary, two targets were missed as follows: (a) the UAS fund was not operational at project closure; and (b) the target for the intermediate results indicator "impact on telecom sector of World Bank technical assistance" was not met, reaching the composite score: 3 (medium impact) against the target of 5 (high impact).

### **Outcomes:**

The access to telecommunications infrastructure was substantially achieved:

- The average distance to the closest telephone in the provinces targeted by the Project reached 1 kilometer against a target of 5, and a baseline of 80 km;
- The percentage of the population in PNG with access to telecommunications services at project closure was 95 percent against a target of 70 percent, and a baseline of 20 percent;



- the target for direct project beneficiaries was more than doubled, reaching the number of 86,764, against a target of 36,900; (d) the target of indirect project beneficiaries was largely exceeded, reaching the number of 1,410,701 against a target of 265,000;
- The target of indirect female project beneficiaries was also exceeded, reaching the number of 705,350 against a target of 132,500; (d) the number of subscribers per 100 inhabitants for mobile cellular telephone subscriptions was exceeded, reaching 65 percent against a target of 60 percent;
- The target of increase in internet usage in rural district centers was exceeded, reaching 50 percent, against a target of 30 percent; and
- The ICR reports (para 25) that according to international research, mobile internet penetration (3G and 4G) in PNG had grown rapidly over the last 10 years and growth in internet access was being driven primarily by mobile Internet, rather than fixed internet access via computers. This observation supports the conclusion that there was an increase in the level of connectivity in PNG, with likely contribution from this project.

### **Outcome attribution**

Because the growth in mobile internet came mainly from commercially viable urban areas, and given the notable private investments in the UAS demonstration project, it is difficult to attribute PNG's growth in mobile internet exclusively to the Project. However, the ICR estimated the direct contribution of the UAS demonstration projects for mobile network upgrade (ICR para 26). Based on NICTA data, the number of new 3G subscribers at the project sites implemented under the UAS demonstration projects for mobile network upgrade increased from 12,283 in September 2017 to 36,992 in June 2018. During the same period, the number of 3G subscribers at the country-level for Digicel and Telikom increased (from 1,247,000 to 1,459,750). Therefore, the direct contribution of the UAS demonstration project for mobile internet was 11.6 percent. Finally, while difficult to quantify precisely, the contribution of the Government and external partners in providing TA and analytical work was also significant.

**Rating**  
Substantial

**Rationale**  
As above.

**Overall Efficacy Rating**  
Substantial



## 5. Efficiency

### Economic Efficiency

At appraisal, it was expected that more significant economic benefits would come from the UAS Demonstration Projects financed under Component 2. To assess these benefits, a financial and economic model was developed to estimate the total subsidy needed to achieve the targets of the project objective, along with the economic benefits that these targets would create in the economy. The model estimated the potential demand and determined whether a one-time subsidy would be required for private operators to be attracted to these locations for the long term. In relation to the component 2, the subsidy was estimated at US\$ 5.7 million, while the economic internal rate of return was estimated at 36%, and the NPV at US\$3.04 million.

The ICR did not use the same model to update the economic analysis conducted at appraisal on the grounds that a number of changes were incorporated during the restructurings, making it impossible to replicate the original economic feasibility analyses. The changes were: (i) the extension of the geographic scope of the demonstration UAS project from two regions to all four regions of PNG (June 2013), (ii) the provision of broader internet access through the change of connectivity method from internet cafes in 60 district centers to mobile broadband (August 2014), and (iii) the revisions to the project components.

The ICR assessed economic benefits that could be quantified, and concluded that the project costs appear to be negligible compared to the broad economic benefits achieved from the project activities over the period 2014-2040 (ICR para 33). As an illustration, the ICR indicates that under the business as usual scenario, the contribution of the ICT sector to GDP would increase from an estimated \$465 million in 2014 to \$1.3 billion in 2040, employment would increase from about 7,000 to 20,000 jobs, and government revenue from the ICT sector from less than \$130 million to about \$360 million. While useful, this contribution comes from the entire ICT sector, and not from the completed project.

This review considers that the changes brought in during restructurings were important factors to justify the update of the economic and financial analysis undertaken at the 2014 restructuring using the appraisal model. Results from the updated analysis could have provided a better picture of benefits expected from the revised project compared to those computed in the context of the original project. Such an approach could have been a better comparison of the economic and financial performance (in terms of NPV and IRR) between the original and the revised projects.

### Administrative Efficiency

During the initial period of implementation, the project management was poor. In 2017, the function for project management was transferred from DCI to NICTA, which improved project management. Also, there were significant delays in procurement. The project's closing date was extended (twice) for a total of three years. The low implementation efficiency was due to the Government's lack of technical capacity, which is a major obstacle for the future UAS project implementation.

Overall, the project efficiency is rated as **modest**.

### Efficiency Rating

Modest



a. If available, enter the Economic Rate of Return (ERR) and/or Financial Rate of Return (FRR) at appraisal and the re-estimated value at evaluation:

	Rate Available?	Point value (%)	*Coverage/Scope (%)
Appraisal	✓	36.00	0 <input checked="" type="checkbox"/> Not Applicable
ICR Estimate		0	0 <input type="checkbox"/> Not Applicable

\* Refers to percent of total project cost for which ERR/FRR was calculated.

## 6. Outcome

The project's relevance of objectives was substantial, as there was a congruence between the country's priorities and the Bank's strategies in that country. The project's efficacy was substantial as most of the outcome indicators for access to telecommunications infrastructure and services were achieved or exceeded. Efficiency was modest, resulting in an overall moderately satisfactory outcome rating.

### a. Outcome Rating

Moderately Satisfactory

## 7. Risk to Development Outcome

This review concurs with the following risks to the development outcome identified in the ICR:

- **Risks linked to Government ownership/commitment:** NICTA's implementation capacity to manage the UAS fund depends upon human capacity and an appropriate regulatory framework being in place. As the rules and regulations were unapproved by the Government at project closure, sustainability of investments made under the project could be compromised by the possibility of policy reversals by the Government;
- **Institutional risks:** While the risk associated with the institutional change is estimated to be low, the risk arising from the weak implementation capacity is considered substantial;
- **Financial risks:** Even though the UAS demonstration projects were completed, the original goal of the UAS fund was to benefit the underdeveloped areas through the continued expansion of the UAS scheme. The goal could not be achieved without operationalizing the fund. In that regard, the Government of PNG needs to make substantial efforts to ensure that the UAS fund is operational;



- **Social risks:** The vandalism on the existing towers was constantly observed, reflecting a level of social dissatisfaction. Therefore there is a substantial risk regarding the physical sustainability of the telecommunications towers; and
- **Risks related to the private sector role:** The sustainability of the telecommunications infrastructure and its efficiency will depend upon a strong private investment response. By the project closure, that response was not established yet, and remains a major risk to the achieved outcome.

On balance, the risk to development outcome is moderate.

## 8. Assessment of Bank Performance

### a. Quality-at-Entry

The project was designed by a Bank's team of experienced ICT specialists who relied on innovative international experience. The team mobilized a grant which contributed significantly to the preparatory activities. The project design was comprehensive and strategically thought through, with appropriate implementation arrangements in place. The risks were identified, and associated mitigation measures envisioned, including technical assistance, training, and financial support for consultancies. Moreover, lessons from similar projects revealed the importance of the preparation of proper fund management, and the need to avoid accumulation of funds without adequate policies and disbursing procedures in place. The key lesson that inspired the project design was the importance of ensuring that UAS projects are properly identified and managed by a responsible institution so that funds collected are disbursed in a timely manner.

In hindsight, the scope of the project components was not well calibrated, the implementation arrangements were not optimal, and the results framework could have been improved. It took two restructurings to come up with an appropriate final project scope and results framework, and adequate implementation arrangements. On balance, quality of entry is rated as Moderately Unsatisfactory.

**Quality-at-Entry Rating**  
Moderately Unsatisfactory

### b. Quality of supervision

Progress during the initial stages of implementation was slow due to poor project management and weak capacity of the implementing agency (DCI), particularly in procurement and financial management. DCI lacked the capacity to implement the Project, and the remedy consisted in transferring the project management to NICTA through a level 2 restructuring in 2014. Despite this action, project management did not improve because of various political and administrative factors. The Bank team provided sustained implementation support to the Project, notably through 11 formal implementation support missions between the project's approval and the closing date and made efforts to resolve delays in implementation. For instance, the team mobilized two additional technical experts, when the second restructuring was



implemented and the project management was transferred to NICTA to accelerate project implementation. In addition, three technical consultants between November 2012 and May 2013 provided in-country support to process critical procurement packages. Comprehensive aide-memoires were prepared after each mission and a total of 13 ISRs were filed at project closing. However, fiduciary management was an issue throughout the period of project implementation. The Bank team did not take any actions to strengthen the financial management capacity.

### **Quality of Supervision Rating**

Moderately Satisfactory

### **Overall Bank Performance Rating**

Moderately Satisfactory

## **9. M&E Design, Implementation, & Utilization**

### **a. M&E Design**

Overall, the project performance indicators were well defined and measurable, with clear guidelines on yearly targets, collection frequency and instruments (Annex 3 of the PAD). NICTA was responsible for collecting the data required to monitor and evaluate the outcome and results of the Project, supported by technical assistance for capacity building provided by the World Bank team. However, some indicators could have been strengthened, including (i) the gender disaggregated indicator, and (ii) the indicator to gauge results arising from the technical assistance.

### **b. M&E Implementation**

Following the changes in the project scope during the two restructurings in 2013 and 2014, some indicators had to be modified. Thereafter, the PIU reporting against the performance indicators was generally effective. However, NICTA lacked a mechanism to obtain crucial data from telecommunications operators, including historical mobile subscriber data. From 2015 onwards, NICTA worked with private operators to generate project performance data, and to make corrective actions as needed. Following the project extension, the project team could have set more ambitious targets.

### **c. M&E Utilization**

The data and information collected during implementation helped the PIU to assess progress and adjust the scope of project interventions and the result framework. The M&E mechanism was used to obtain data from telecommunications operators, and adequate systems were eventually set up and indicators were systematically monitored by the PIU in collaboration with private operators and relevant stakeholders.



## M&E Quality Rating

Substantial

## 10. Other Issues

### a. Safeguards

The Project was classified as a Category B at appraisal and triggered two safeguard policies (OP4.01 Environmental Assessment, and OP4.10 Indigenous Peoples), because of limited expected environment impact from the construction of telecommunications network infrastructure and modifications to existing buildings and premises whereby cable work would take place. The Department of Communication and Information prepared Environmental and Social Assessments (ESA) and an Environmental and Social Management Framework (ESMF), which were deemed to cover not only this project but also provide a framework for future UAS-funded projects.

During implementation, there were no significant safeguards issues. Some minor grievances were recorded in relation to installation of some of the telecommunications towers. There was an administrative misunderstanding between NICTA and the Conservation and Environment Protection Authority over the need for Environmental Permits for the erection of Digicel's towers. This issue was resolved when it was determined that installation of communications towers was not a prescribed activity under the Environment Regulation 2002, and that permits were not required under the Environment Act 2000. The Bank recommended that for future activities NICTA might consider a best practice approach and prepare a Code of Environmental Practice to safeguard environmental and social issues for tower installations. There were also disputes between owners of customary lands over the allocation of compensation fund lease payments among the landowner groups. The disputes resulted in some minor vandalism at tower sites, but were settled by Digicel. The grievances were minor and that they were settled by Digicel before the project closure (ICR para 56). It is not clear why the involuntary resettlement safeguard was not triggered.

### b. Fiduciary Compliance

#### Financial management

Although an accounting officer was a requirement for the PIU, the officer was never hired, and the PIU relied on the services of a financial management consultant. The submission of required financial management documents experienced long delays throughout project implementation. Since the project effectiveness until the year 2014, financial management rating varied from MU to MS. The June 2018 ISR assessed the financial management performance as *Moderately Unsatisfactory* as NICTA's audits for 2015 and 2016 and quarterly Interim Financial Review reports for Q4 2017 and Q1 2018 remained overdue. The ICR reports (para 58) that the March 2017 Financial Management Implementation Review Report stated that no accounting information was taken up in the books of account of NICTA (ICR para 58). Overall, the FM capacity was weak throughout the period of project implementation; and the Bank did not take any substantive actions to strengthen it.

#### Procurement



The performance in project procurement varied from Moderately Satisfactory to Unsatisfactory throughout the period of project implementation. The *Unsatisfactory* rating in August 2016 was related to poor procurement planning and implementation. A procurement advisor was hired in 2015 to support NICTA with the implementation of delayed procurement activities, but proved ineffective. The procurement performance rating was upgraded to *Moderately Satisfactory* in May 2018 as all planned procurement activities were completed and previously identified delays were addressed, following the Bank's team support to help close the project's accounts.

### c. Unintended impacts (Positive or Negative)

The ICR did not find unintended impacts.

### d. Other

The ICR did not find any other impacts.

## 11. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Moderately Satisfactory	Moderately Satisfactory	
Bank Performance	Satisfactory	Moderately Satisfactory	Project design and implementation had significant shortcomings
Quality of M&E	Modest	Substantial	
Quality of ICR	---	Substantial	

## 12. Lessons

The ICR identified a number of lessons, which are rephrased and summarized below:

- **Weaknesses in institutional capacity should be addressed early to ensure smooth implementation of the project.** The project's experience shows that the weak capacity of the PIU in procurement and financial management and the limited institutional capacity in the management of the UAS fund caused significant delays in the project launching. NICTA had to hire dedicated consultants/staff and an independent verification agency to support the project implementation.
- **Improvement in rural connectivity can benefit from targeted partnership between the private sector and the UAS demonstration projects.** Despite the challenges



experienced during implementation, the project team was successful in improving the connectivity for rural people and the rural economy through working with the private sector in upgrading and modernizing the existing telecommunications infrastructure and supporting the supporting telecenters.

- **Financial sustainability of rural communication infrastructure is uncertain, and may require subsidies or tower sharing to properly manage the infrastructure.** The operation and maintenance costs of rural communication are higher in comparison to communication sites in urban areas. This is primarily due to the poor access conditions of the sites.
- **For communications infrastructure structure to achieve desired impacts in rural areas, enabling services and fair market competition is needed.** To realize the communications potential, reliable electricity service is a prerequisite. Given the low purchasing power in rural areas, the subscribers need to have the purchasing power to buy phones. Moreover, there is a need to promote healthy competition in the market to ensure users benefit from lower costs and better services.

### 13. Assessment Recommended?

No

### 14. Comments on Quality of ICR

The ICR is well written, and provides a comprehensive review of the project design and implementation. A reconstructed theory of change outlines a detailed results chain, which could have been strengthened. Other aspects of the ICR that could have been improved include: (i) the economic analysis of the project, because the reasons provided to explain the lack of an updated economic analysis using the original methodology are not convincing, (ii) the Bank performance rating was overestimated given the weaknesses that affected the project design and implementation. Other performance ratings reflect the evidence provided in the ICR and are consistent with the ICR guidelines. The lessons learned are sound and were derived from the project implementation experience. The ICR quality is rated as substantial.

#### a. Quality of ICR Rating

Substantial

