

Environmental Assessment Report

Summary Initial Environmental Examination
Project Number: 43141
September 2009

Papua New Guinea: Civil Aviation Development Investment Program

The summary initial environmental examination is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

SUMMARY INITIAL ENVIRONMENTAL EXAMINATION (SIEE)

I. INTRODUCTION

1. The Government of Papua New Guinea (the Government) has taken up a plan to improve the current state of the country's domestic air transport system under the Civil Aviation Development and Investment Program (Investment Program). Five major airports (Project 1) in the country have been identified for upgrading and rehabilitation, mainly based on the relative importance of these airports as domestic hubs for tourism and economic development on a regional basis.

2. Initial environmental examination (IEE) was prepared for each airport project based on the available preliminary design information. The Investment Program has been classified as Category B in accordance with ADB's *Environmental Assessment Guidelines (2003)*, and prepared in line with the Government's environmental requirements. The Government's *Environment Act (2000)* uses the *Environment (Prescribed Activities) Regulation (2002)* which designates projects that need an environmental assessment as "Prescribed Activities." The upgrading/rehabilitation of airport is not listed in the "Prescribed Activities" and therefore, would not require an Environmental Permit (EP). However, the Department of Environment and Conservation (DEC) has advised that certain activities may require an EP depending on the duration and scale. The Civil Aviation Authority (CAA) will therefore disclose the scale and scope of future subprojects to DEC to determine the procedures and any EP needed under the *Environment Act (2000)*. Environmental assessment reports will also be prepared for all subprojects in future, in line with the Environmental Assessment Review Framework (EARF) that has also been prepared.

II. DESCRIPTION OF THE INVESTMENT PROGRAM

3. The proposed Investment Program will entail the upgrading and rehabilitation of the Project 1 airports including: (i) Wewak, (ii) Hoskins, (iii) Gurney, (iv) Mt. Hagen, and (v) Jackson's Domestic airport. The proposed airport improvement is designed to bring the facility to a level of development to fully meet international airport safety standards, and provide sufficient runway length to accept unrestricted operations of F100 jet aircraft or equivalent aircraft operations. The Investment Program will also include institutional strengthening and capacity building to support strategic management of the aviation development while improving environmental management.

4. The Multitranche Financing Facility (MFF) from ADB is expected to be released in four tranches. Table 1 presents the identified airports and the activities that will be undertaken in the respective airports under Project 1.

SUBPROJECT	LOCATION	PROPOSED DEVELOPMENT WORKS
Wewak Airport	East Sepik Province	<ul style="list-style-type: none">▪ Extend runway length by 200 m, from existing 1,600 m to 1,800 m▪ Retain runway width of 30 m similar to existing▪ Construct extension strip width of 150 m (mark 90 m to match existing)▪ Extension surfacing: prime and 3x coat seal (10 mm/7 mm/sand) similar to existing condition▪ Realign Perigo Road▪ Realign existing large storm water drain▪ Construct bridge over Brandi Road at realigned storm water

SUBPROJECT	LOCATION	PROPOSED DEVELOPMENT WORKS
		<ul style="list-style-type: none"> drain ▪ Extend car park at rear of Terminal Building ▪ Lop infringing trees in Golf Course to clear the approach/take-off path ▪ Supply, install and commission a New PAPI Landing Aid system
Hoskins Airport	West New Britain Province	<ul style="list-style-type: none"> ▪ Widen the existing runway from 30 m to 45 m ▪ Construct a 90 m end of runway safety zone (RESA) at southeast end, and stop ways at both ends ▪ Widen the existing flight strip to 150 m ▪ Replace all open drains within the strip with piping systems ▪ Relocate a Precision Approach Path Indicator (PAPI) visual guidance system at the southeast end to the new touch down point ▪ Widen the taxiway shoulders to 5 m ▪ Design the Apron to provide for two F-100 parking positions ▪ Reinstate pavement markings
Mt. Hagen Airport	Western Highlands Province	<ul style="list-style-type: none"> ▪ Strengthen the pavements to the main runway, taxiways, and apron ▪ Lengthen runway by 110 m at the western end ▪ Construct 3 m-wide full strength asphalt surfaced shoulders on each side of the main runway ▪ Surfacing of the strengthened aircraft pavements and new shoulders to runway with dense graded asphalt and runway grooved ▪ Widen main runway strip from 90 m to 150 m wide ▪ Reconstruct sealed stopways 60 m x 30 m-wide at each end of the strengthened runway ▪ Reconstruction of 90 m x 90 m RESA's beyond the stopways at each end of the runway ▪ Flank earthworks to match raised levels of aircraft pavements ▪ Install new lighting systems to the main runway ▪ Strengthen the pavements to the secondary runway ▪ Reinstate all pavement markings ▪ Adjustments to the PAPI Landing Aid System at the end of runways
Gurney Airport	Milne Bay Province	<ul style="list-style-type: none"> ▪ Extend the eastern end runway by 160 m x 30 m to a total 1,850 m ▪ Construction of a new 60 m stopway at the eastern end ▪ Construction of 90 m x 90 m RESA at both runway ends ▪ Apply single coat 7 mm chip reseal to existing pavements and reinstate fuel resistance membrane and line markings ▪ Diversion of the existing Open Unlined Drains (OUD) at the Eastern end and install a new culvert under the RFFS access road ▪ Install a new multi-cell culvert under the plantation access road ▪ Relocate existing PAPI at the eastern end and conduct flight test
Jackson's Airport	National Capital District	<ul style="list-style-type: none"> ▪ Extend domestic apron by 162 m long x 80 m-wide at the NW end ▪ Construct new stub taxiway connecting the new extended Apron to the existing parallel taxiway. Taxiway min 18 m wide ▪ Construct 5 m-wide sealed shoulders to the new Apron and new stub taxiway ▪ Construct new aircraft pavements

SUBPROJECT	LOCATION	PROPOSED DEVELOPMENT WORKS
		<ul style="list-style-type: none"> ▪ Construct concrete encased duct bank 6 x 100 mm x 60 m long ▪ Construct new Apron access road 10 m wide x 90 m long ▪ Construct flank earthworks, topsoil and grassing ▪ Construct 4 concrete pads, each 22 m x 12 m ▪ Construct storm water drainage associated with the new apron extension and new stub taxiway including: (i) New RC box culvert 2 No 1900 mm wide x 1250mm high x 45m long under new stub taxiway; (ii) Construct open drain lining either end of the new box culvert; (iii) Realign the existing open unlined drain; (iv) Construct an open Vee Drain beyond the NW Shoulder; and (v) Supply and install apron flood lighting to the extended apron ▪ Paint new pavement markings to aircraft pavements

III. DESCRIPTION OF THE ENVIRONMENT

5. Covering a land area of some 460,000 square kilometres (km²), PNG is the largest of all Pacific Island nations. Its population of approximately 5.7 million is sparsely scattered over this large land area, with an average density of 12 persons per km². PNG's varied and rugged terrain supports an extraordinary range of ecosystems.

6. The climate of Wewak is generally hot and humid. Temperature ranges from 23°C (day) and 12°C (night). The temperature may fluctuate within these ranges but subjected to changes, either a degree or two higher or lower the given temperature range, due to wind movements, volcanic dust or climate change. In Western Highlands Province (Mt. Hagen), the climate is alpine/sub tropical. Temperatures vary from about 31°C (day) to 2°C (night). This climate persists throughout the year. The northwest and southeast trade winds continue throughout the year. The project area is expected to receive up to 10% more rainfall for a 1°C of global warming (by 2100, the average temperatures are expected to rise by between 1.6–3.4°C).

7. Air quality in PNG remains good as a result of low population densities and low levels of industrialization, including in areas where the five airports will be rehabilitated. Water pollution, caused by unregulated runoff from industrial activities and the direct dumping of wastes particularly domestic waste and sewage into river systems, is common in PNG, particularly in more developed provinces. The effect of water pollution, particularly for the 71% of the rural population who have no access to an improved water supply, usually manifests itself as diarrhoea which is a major contributor to childhood morbidity and mortality.

8. Water resources are abundant with an estimated total renewable water resource per capita of 159,171m³ per person in 2002. However, only 29% of the population has access to safe drinking water. The presence of high mountain ranges and abundant rainfall leads to high runoff over most of the country. There are nine hydrological drainage divisions (basins) in the country. The largest river basins of the country are the Sepik, Fly, Purari, and Markham. Even though the Sepik has the lowest annual discharge, it has the largest catchment area. Rainfall varies widely across the country from less than 1000 mm to over 14,000 mm per annum. The country has an abundance of surface water resources and therefore groundwater resources have not been developed much, although there is evidence increasing use of groundwater as a source of reliable high quality water. The bacteriological and chemical quality of most of the groundwater in PNG is good.

9. The forests of PNG are the third largest block of intact tropical forest in the world. Papua New Guinea has significant forest resources that have been commercially exploited in industrial scale developments since the 1970s. Estimates of PNG's forest resources vary between 26.1 million hectares to around 33 million hectares or approximately three-quarters of PNG's land mass. Five main forest types dominate the country's landscape: lowland plains, lowland hills, lower montane forests, dry evergreen, and swamp forests. Some 200 tree species are extracted for commercial purposes. Those in greatest demand include premium furniture timbers such as rosewood, kwila, walnut, pencil cedar, taun, bintangor, malas and hopea. There are no valuable ecological resources and protected sites within the vicinity of the airports. The proposed developments will not be located within, or near any, Declared Protected Area for natural habitats or rare or endangered species.

10. The average population density is about 12 people per m³, making PNG the country with the lowest density in the Pacific region. Average density in this case is very misleading as there are great differences between provinces. Life expectancy in PNG is 57 years and the adult literacy rate is approximately 65% (2001 figures). The prediction of doubling the population in less than 30 years with potential extension of life expectancy will greatly increase the pressure on current land and natural resources with attendant environmental impacts.

11. The greatest health concern in PNG is HIV/AIDS with current infection rates standing at 50,000 individuals with a potential infection rate of 30% of the total population within 10 years. The areas with the highest occurrence of the disease are Western Highlands, Sandaun, Western, and Morobe Provinces and the NCD – areas where population concentration and pressures on the natural environment are highest. Vulnerable groups include women, sex workers, youth, the poor, and workers in industrial enclaves (mining camps, factories, etc.).

IV. SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

1. Impact Associated with Planning, Location, and Design

12. Project 1 will mainly involve the rehabilitation and upgrading of existing airports and would not entail any acquisition of additional land for the development works. All works will be undertaken within the existing property of the airports or will be done in state land, i.e., diversion of Perigo Road and the Stormwater Drainage Channel as a result of the development works proposed for Wewak Airport. There are no anticipated adverse impacts as a result of the design or the siting (existing airports) of the proposed projects.

13. Sensitive receivers such as residential areas, schools, and health centres have been assessed and it was found that the residential dwellings near the airport subproject are generally set back sufficiently from the airport boundary, so that noise will not seriously affect sensitive receivers in the developments. There are no schools or any medical facility near the subproject airports. There are no major cultural/historical sites within the vicinity of the areas of developments which may be adversely affected. During the detailed design phase and in preparation for the construction phase, the CAA will prepare tender documents to ensure that contractors will be prepared in implementing the environmental impacts mitigation.

14. The requirements in the contract will include full implementation of the EMP. The contractor would also be required to engage capable and trained staff to take responsibility for the environmental management at the working level. The effective implementation of the EMP will be audited as part of the loan conditions. In this regard, the CAA will also prepare resources

to fulfil the requirements of the law and guide the contractors on the environmental aspects of road construction.

2. Environmental Impacts of Construction Activities

15. Most of the environmental impacts associated with proposed upgrading and improvement works will occur during construction phase, which are temporary, reversible and can be mitigated properly. The subprojects will be improved within existing airport property and there will be minimal land clearing. In the construction phase, the physical impacts will be from earthworks, noise, and may have potential impacts on surface water. The use of bitumen can be controlled by following prescribed management plan procedures and all the mitigation measures described in the EMP. No significant impacts should arise if the environmental management plan is implemented properly. Monitoring will be undertaken to ensure that the impacts are within acceptable levels and when necessary, identify corrective measures.

16. The construction work will also involve dismantling of existing base and bitumen. Spoiled material will be reused as much as possible. However, remaining spoiled material will need to be disposed off. There will be no disposal area allowed to be located nearby water bodies. Earthwork to replace the base and resurfacing works will create dust, noise, and contaminated air. These impacts will not be significant as the sub-projects are located far from settlement areas. Regular watering of exposed areas will be required during this period. Construction waste will be addressed properly to avoid potential soil contamination and nuisance to the public, and solid waste management will be addressed.

17. There are several sources of water quality impacts in a construction site such as fuels, lubricants, and solid waste stockpiles. The stockpiling of these materials can result in localized impacts within the foot print of stockpiles, and have downstream effects on the land, waterways and sea, if materials are carried by rain and floods. These impacts can be avoided by proper storage of the materials, proper disposal, and avoiding stockpiling near water sources. Impacts from waste water from construction sites/camps can be mitigated by siting the construction camps away from water bodies, and providing water and sanitation at construction worker camps. Solid waste can also be unsightly, spread into the environment by runoff and floods, and can leach contaminants into soils, groundwater and waterways. This includes construction site domestic rubbish, masonry and other materials from demolitions, washing of equipment and wastes. Mitigation will include proper handling of solid waste. If complaints are received, possible sources of the problem will be investigated, water samples will be taken and analyzed, and compared with the baseline and on *Water Quality Criteria Regulation (2002)*.

18. Top soils, grass areas and service trench material will need to be stockpiled in a controlled area during construction so that they can be returned wherever possible to minimize overall impacts. Stockpiles will also be required of quarry (gravels, sand, rock) and building materials (cement, masonry products, framework etc). All stockpile areas will be (i) located in areas either already damaged or designated as areas to be paved or concreted later to minimize the overall area damaged; and (ii) placed in controlled areas surrounded by berms; and/or repaired as soon as possible to limit losses through erosion.

19. For possible environmental impacts from earth works, engineering controls include: (i) balancing cut and fill and erosion protection measures will be designed and installed to control soil erosion, both at all the constructed works and in peripheral areas, including possible use of bioengineering techniques for slope stabilization aside from training walls; (ii) excavated materials will not be disposed near water bodies or streams, in forests, or in agriculture land;

and (iii) to reduce dust, the contractor will be required to sprinkle water when earth work is carried out near settlements. Detailed mitigation measures will be described in the bidding document.

20. Each contractor will be required to submit a site environmental management plan which describes how the contractor will implement mitigation measures, where the borrow areas will be needed, and how excess excavation materials will be disposed off. Construction camps, borrow areas, and asphalt mix plant will be located at least 500 m away from the settlements and forests areas.

21. During construction, laborers/workers will be hired from local communities or other parts of the province to the extent possible, to avoid occurrences of social conflicts. If workers are hired from other areas, the workers' camp will be provided with an adequate supply of water, toilet facilities, and self management of solid waste, thereby, minimizing resource conflicts.

3. Environmental Impacts of Operation Activities

22. Environmental impacts during operation stage that needs attention will be negligence of mitigation measures, particularly wastes and pollution, noise, and airport accidents. There is significant risks where waste might not be managed properly and may escape to the environment, resulting in the pollution of surrounding land, air and water, particularly sewage; fuels, oils and other chemicals; solid wastes; fire retardants/fire-fighting chemicals; and stockpiled materials.

23. The septic sewage system, if not properly maintained, may leak into the surrounding soils, groundwater, drains and streams, and is a significant hazard to surrounding communities. To mitigate risks of possible sewage pollution, the Investment Program will maintain the sewage system in good condition, and when possible, connect it to a nearby mains sewer which leads to a treatment plant. Otherwise, a sewage system that will not cause pollution to the environment will be established. All sewage systems and the surrounding environments will be monitored.

24. Procedures and facilities for the handling of fuels, lubricants and other chemicals (which are part of normal airport operations and aircraft maintenance) will be established to ensure that such hazardous chemicals will not escape into the environment and pollute soils, ground waters and waterways. Maintain strict procedure to proper handling of fuels, since small amounts lost through regular poor handling and storage, as well as significant spills that can result in large-scale releases over a short time period, may cause significant impacts. Therefore, review of the existing procedure and facilities will be undertaken, upgrading of facilities will be done when necessary, and a monitoring system will be established and included in the Investment Program's EMP. In addition, fuel and sediment traps will be installed in drain entries to capture accidental spills as an extra precaution.

25. Solid wastes and other liquid wastes generated during operations can spread into the environment by runoff and floods and affect soils, groundwater and waterways. This includes biohazards generated during operations from incoming international flights. The proper handling, storage and disposal of all wastes generated during operational phase of the project will be part of the EMP. A solid waste management system including putting waste bins in strategic locations within the facility will be developed for the airport operation and proper sanitation and sewerage facilities will be constructed to address waste management.

26. The use of fire retardant chemicals for the fire fighting service, including regular use during drills, may cause impact on the environment if not properly handled. Therefore, it will be a requirement under the EMP that all existing areas of potential contamination be surveyed and for airport management to carry out appropriate remediation.

27. Improvement of airport facilities may lead to increased aircraft traffic, and hence increased noise. Nonetheless, the present frequency of flight at domestic airport is still very low, and it is not expected that there will be a sharp increase of flight frequency. Therefore, aircraft noise does not present a significant community issue at any of the sites due to low jet traffic volumes. General problems with noise can be minimized by aircraft operational procedures including reduced power settings, following nominated climb gradients and flight paths at different times of the day, and avoidance of significant operations at unsociable hours. A key issue in the EMP is to monitor noise exposure levels and develop planning rules for construction of dwellings within the noise exposure footprint, and operational rules in relation to the location and timing of ground running of aircraft.

V. INSTITUTIONAL REQUIREMENTS AND ENVIRONMENTAL MONITORING PLAN

28. Effective implementation of the EMP requires an institutional setting, framework and information flows. The executing agency of the MFF Program will be the CAA. The CAA will work in close association with the Investment Program Implementation Unit (PIU) to monitor the environmental aspects of design, contracting, mobilization and construction. The PIU will be responsible for the daily implementation of the program through program support consultants. An international environmental specialist (IES) will be engaged intermittently as part of the program support consultants, i.e., eight months over the Investment Program period and 96 months as national expert input. The primary tasks of the IES will be to: (i) strengthen the environmental management of the Investment Program during detailed design, bidding process, contract process, construction, and implementation; (ii) supervise and guide the environmental assessment process for all subprojects under the MFF; (iii) supervise EMP implementation of subprojects; and (iv) undertake the necessary institutional strengthening including on-the-job-training for the environment officer (EO) of the CAA. The IES will report to the program director of the PIU, and the EO will report to CAA. They will supervise and monitor the environmental assessment process and monitor the EMP implementation of all subprojects.

29. Prior to implementation of the subproject packages, CAA, through PIU, will notify DEC through submission of subproject notification in accordance with DEC's prescribed format, and endorsement of the environmental assessments required by the Government. CAA through the PIU will have responsibility to ensure all mitigation measures described in the EMPs are implemented by the Contractors for each of the respective subprojects. The EARF that will include general description of the anticipated environmental impacts, screening and classification procedures, and environmental assessment of subprojects in future tranches will also include compliance with all PNG statutory requirements.

30. The contractor will be responsible for EMP implementation while carrying out the works. This is to be accomplished by (i) incorporating environmental safeguards in the technical specifications, (ii) including a provision for the contractor's EMP to be appropriately reviewed before construction commences, and (iii) monitoring to be undertaken and reported to the PIU during the course of the works.

VI. PUBLIC CONSULTATION AND DISCLOSURE

31. Public consultations were carried out in May 2009. Persons consulted included local residents, community leaders, and local officials. The main purpose of the consultation were to present the proposed Investment Program, illicit issues and concerns that the people in the impact area may have relevant to the proposed development, and discuss the ADB environmental requirement for Investment Program of this type. The participants of the public consultation were unanimous in their support for the proposed development and will not interpose any objection to its implementation.

32. Aside from support to the Investment Program, there are a number of concerns and/or proposals raised by the stakeholders during the public consultations, as follows: (i) priority in employment and livelihood opportunities for qualified village folk of settlement areas within the impact areas during the construction and operation phases of the Investment Program; (ii) provision of potable water supply system for the villages within the periphery of the sub-project airports; and (iii) construction of market places for the villages within the periphery of the sub-project airports.

VII. FINDINGS AND RECOMMENDATIONS

33. The IEE reports on the various subprojects provided assessment on potential environmental impacts associated with Tranche 1 and their mitigation measures. As all of the intervention at the five airports will be rehabilitation of existing facilities, and to be undertaken within the airport boundary, it was found that the environmental impacts of airport rehabilitation will not cause any significant environmental impacts.

34. The responsibilities for the implementation of mitigation measures have been indicated in the IEE and EMP and will be clearly defined in contracts and agreements, and the responsibilities by various parties will be checked and monitored by the Environmental Officer of the CAA, including a mechanism to address unexpected environmental impacts. The implementation of the environmental mitigation measures during construction period will be assigned to the contractors and these requirements will be included in the contracts. The IEE, including the EMP, will be used as basis for an environmental compliance in a regular program of environmental monitoring and auditing. In addition, any condition included as part of the environmental compliance from the Government (DEC) will also be included as a basis for the environmental monitoring and compliance program. Considering the above, the IEE reports prepared for the five airports can be finalized as environmental assessment of the Investment Program.

VIII. ENVIRONMENTAL ASSESSMENT AND REVIEW FRAMEWORK

35. The executing agency of the Investment Program will be the CAA. The agency will be responsible for the implementation of the EARF including preparation of IEE/SIEE or EIA/SEIA (if warranted), and implementation of EMP. The suitable environmental assessment documents together with environmental clearance from the environmental agency (as necessary) will be submitted to ADB together with the Periodic Financing Request (PFR) for review and approval prior to finalization of contracts or commencement of work. Public consultations will also be carried out and CAA will submit the required documentation to ADB.

36. PIU in CAA will ensure that appropriate environmental assessment reports (incorporating EMP) are submitted to ADB in time for review and approval prior to contracts or

commencement of work. They will also ensure that the EMP and all required mitigation measures during construction are included in the contractors' contracts with requirements to update the EMP in response to any unexpected impact. PIU will ensure that the EMP and all mitigation measures during construction are fully implemented.

37. During the implementation of the MFF, ADB will review environmental assessment reports for subsequent subproject approvals, disclose environmental assessments where necessary before a PFR is submitted to ADB, and monitor the EMP implementation and conduct due diligence as part of MFF reviews. ADB will assist CAA in carrying out its responsibilities and to build capacity and ensure that CAA conducts the required consultations with project affected groups and local NGOs. An EARF has been prepared (available as Supplementary Appendix) that presents the general anticipated environmental impacts, subproject selection criteria, and subproject environmental procedure. It will guide the preparation and approval of environmental assessments of future projects likely to be financed under the Investment Program.

IX. CONCLUSION

38. The IEE reports for the subproject packages have assessed the potential environmental impacts generated by the sample subprojects under Project 1. The environmental impacts are predicted to be temporary, reversible and can easily be mitigated using available methods. The proposed mitigation measures proposed in the IEE/EMP for the sample subprojects are sufficient. At the implementation stage, CAA will monitor the implementation of mitigation measures and monitoring programs specified in each IEE/EMP. With these measures in place, it is predicted that all potential environmental impacts can be mitigated to insignificant levels, and therefore, no further impact assessment is considered necessary. It is also envisaged that environmental impacts identified by the study will not result in any residual impacts. A semiannual report on EMP implementation will be submitted to ADB and the relevant government agencies.

39. Environmental assessment will be required for all subprojects in future tranches. EARF will guide the environmental management of the overall Investment Program and in implementing environmental assessment of individual future subprojects.