

## **Environmental Monitoring Report**

---

Semi-annual Report

March 2017

# **Highlands Region Road Improvement Investment Program – Tranche 2.**

Mendi – Tambul Road Sub-project.

Prepared by Department of Works for the Asian Development Bank.

This Semi-annual Environmental Monitoring Report 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. Your attention is directed to the "terms of use" section of this website.

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, the Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.

**Loan Number : 3076/3077 PNG:**

**Project Number : 40173-043**

**Report : Semi-annual**

# **HIGHLAND REGION ROAD IMPROVEMENT INVESTMENT PROGRAM**

## **Mendi to Tambul ROAD SUB-PROJECT ENVIRONMENTAL SAFEGUARDS MONITORING REPORT**

**(July to December, 2016)**

**Project Implementation Unit**

**Department of Works**

**National Capital District**

**Papua New Guinea**

**March 2017**

## Table of Contents

List of Figures .....	4
List of Tables .....	4
Abbreviations .....	5
1. Introduction .....	6
1.1 Background.....	6
1.2 Project Description.....	7
1.3 Purpose .....	8
1.4 Methodology .....	8
2. Monitoring results and findings.....	8
2.1 Contractor’s camp and yard .....	9
2.2 Erosion and sedimentation control.....	10
2.3 Water quality.....	11
2.4 Air quality.....	11
2.5 Noise .....	11
2.6 Waste management.....	11
2.7 Hazardous materials management .....	12
2.8 Aggregate extraction.....	13
2.9 Trees removal and vegetation management .....	14
2.10 Socio-economic issues (workers).....	14
2.11 Socio-economic issues of community .....	15
2.12 Traffic management.....	16
2.13 Consultations .....	16
2.14 Environment-related grievances.....	16
3. Institutional Arrangements .....	16
4. Conclusions and Recommendations .....	17
4.1 Conclusions .....	17
4.2 Recommended actions .....	18
Appendices .....	19
Appendix 1 : List of References.....	19
Appendix 2 : List of People Interviewed.....	19
Appendix 3 : Status of Corrective Action Requests.....	19

## List of Figures

Figure 1 : Sedimentation on food gardens at Chainage 19+.....	10
Figure 2 : Dumping of Road side waste at Chainage 51+167.....	12
Figure 3 : Road overburden obstructing a house.....	12
Figure 4: Grey water discharge at Ande Camp.....	12
Figure 5 : Dirty water (low quality) at Ande River due to material extraction .....	13
Figure 6 : Tree replanting at Enep village.....	14
Figure 7 : workers at Ande camp without safety PPEs .....	15

## List of Tables

Table 1: Staffing and reporting roles for execution of CEMP .....	17
Table 2 : Corrective Action Plan .....	18

## **Abbreviations**

ADB	- Asian Development Bank
AP	- Affected People
CAR	- Corrective Action Request
CEMP	- Construction Environment Management Plan
CRO	- Community Relations Officer
CSC	- Construction Supervision Consultant
DBST	- Double Bitumen-layer Surface Treatment
DC	- Design Consultant
DOW	- Department of Work
EA	- Executive Agency
EMP	- Environmental Management Plan
EO	- Environmental Officer
ESSU	- Environment and Social Safeguards Unit
FPM	- Field Project Manager
GoPNG	- Government of Papua New Guinea
GRC	- Grievance Redress Committee
HCRN	- Highland Region Core Road Network
HIV	- Human immunodeficiency Virus
HRMG	- Highland Road Maintenance Group
HRRIP	- Highland Region Road Improvement Investment Program
IA	- Implementation Agency
IEE	- Initial Environment Examination
ISS	- International Safeguards Specialist
LLG	- Local Level Government
MFF	- Multi-tranche Financial Facility
MOA	- Memorandum of Agreement
NRA	- National Road Authority
PWM	- Provincial Works Manager
PNG	- Papua New Guinea
PRO	- Public Relations Officer
QMP	- Quarry Management Plan
ROW	- Right of Way
RP	- Resettlement Plan
SHP	- Southern Highland Province
SIS	- Socio-economic Impact Study
SPS	- Safeguard Policy Statement
STDs	- Sexual Transmission Diseases
TOR	- Terms of Reference

## **1. Introduction**

### **1.1 Background**

01. The Highlands Region of Papua New Guinea (PNG) comprises of the provinces of Western Highlands, Jiwaka, Southern Highlands, Hela, Eastern Highlands, Enga and Simbu. These provinces are major contributor to the PNG economy through their agricultural production and mineral resources. A well maintained road network is essential to facilitate the movement of goods and people. The Government of PNG (GoPNG) has made significant investment in improving the road network but a lack of maintenance has resulted in deterioration of the roads to such an extent that the Highlands Core Road Network (HCRN) is now in poor condition.

02. In order to address the deterioration of the HCRN there is a clear need to: (i) implement a program of regular maintenance on all HCRN roads that are in good condition; and (ii) improve those roads that are in poor condition and ensure that maintenance begins on those roads as soon the improvement works are completed.

03. The GoPNG has negotiated a Multi-tranche Financing Facility (MFF) loan with the Asian Development Bank (ADB) to implement the Highlands Region Road Improvement Investment Program (HRRRIIP). The HRRRIIP includes projects to improve the HCRN, the preparation of long-term maintenance contracts for the HCRN, and the capacity development of road agencies. In total, 13 road sections are expected to be funded under the program. The Execution Agency (EA) for the program is Department of Works and Implementation (DOW) whilst the Highland Road Maintenance Group (HRMG) is the Implementation Agency (IA) for road improvement works. The National Road Authority (NRA) is the IA for road maintenance works.

04. The Project 2 (or Tranche 2) included improvement to three road sections namely, Mendi-Tambul (55.53km), Kotna-Lampramp (31.65km) and Ialibu-Kagua (32km) in the Southern Highlands/Western Highlands, Western Highlands and Southern Highlands provinces, respectively.

05. The rehabilitation of the Mendi - Tambul road is one of the 13 projects supported through the above loan. The civil works commenced in January 2016 with the mobilization of the contractor. The contract for construction has been awarded to COVEC (China) Limited. The construction period of the project is 30 months. The defects liability period of one year begins after the road is rehabilitated. The completion of this road will be an effective link between Mendi – Munuhu district in Southern Highlands and Tambul - Neibilyer district in Western Highlands province.

06. After the end of defects liability period, a program of maintenance of ten years commences. The resettlement work has nearly completed as per the resettlement completion report of December 2015. The assessment of grievances is being addressed inclusive of verification of missed out affected people (AP) during the reporting period. Few APs missed out on structures, trees and grave sites due to dispute during the last payment are addressed in August 2016.

## 1.2 Project Description

07. Mendi – Tambul road section is 55.53 km long that connects Upper Mendi LLG and Lower Mendi LLG in Southern Highlands Province with the Mt Giluwe LLG and Neibilyer LLG in the Western Highlands province. The construction work of this road section included up-grading of the tract that has been built in 1960s. The improvement works commenced in January 2016 and all works will be completed by 24<sup>th</sup> July 2018. This includes an additional 2 months to complete all road works before being handed over to the national Road Authority (NRA) for maintenance.

08. The road consists of a 5.5 meter sealed carriageway with 0.25 meter gravel shoulders on either side together with all road furniture as per the design. The subproject work has taken place within the existing road corridor and direct impacts are confined to the edge of the existing road and the construction limits. The entire stretch of the existing road is situated on customary land the use of which has been agreed via memoranda of agreement (MOA) signed between the clan leaders and the DOW permitting the use of customary land for public infrastructure.

09. The environmental impacts assessed at the time of preliminary design categorised the subproject as Category B for environment. The same category was confirmed by the in-depth environmental analysis conducted at the time of project preparation. The Initial Environment Examination (IEE) dated July 2013 has already been disclosed in the web site. The IEE confirmed that environmental impacts of the rehabilitation of the Mendi – Tambul subproject road are limited to the road corridor, are of minor scale and can be mitigated through the thorough implementation of the measures contained in the environment management plan. The impacts such as dust, noise, materials sourcing, storage, haulage, soil erosion, sedimentation and run-off are likely to occur mainly during the construction phase.

10. Based on the EMP presented in the IEE, a construction environment management plan (CEMP) was prepared by the contractor. The plan was reviewed by the Construction Supervision Consultant (CSS) team and approval provided by the Environment and Social Safeguards Unit (ESSU) of DOW in March 2016. Prior to preparation of CEMP, three trainings were conducted by the safeguards specialist of PIU for the contractor staff. The workshop in February 2016 was on CEMP preparation whilst the subsequent training focused on its monitoring. The workshops were attended by the contractor staff, HRMG and CSC. According to pre and post evaluations conducted, few participants have had basic knowledge on CEMP and its monitoring where several monitoring tools were discussed.

11. The IEE consisted of the establishment of institutional arrangements for implementation of CEMP, grievance redress mechanism and consultations with the communities during the program of construction and maintenance.

12. Internal monitoring is being conducted by the environmental specialist of the Construction Supervision Consultant (CSC) whereas independent monitoring is conducted by the Environmental Officer (EO) of HRMG. Monitoring reports are prepared on a monthly basis. ESSU/PIU have reviewed monitoring reports to provide feedback. Presented in this document is the second semi-annual monitoring report for disclosure by ADB.

### **1.3 Purpose**

13. This report is written to present the status of environment including the compliance with approved CEMP in respect of the Mendi - Tambul road section covering July to December 2016. Semi-annual environment safeguards monitoring report is a requirement under the SPS. This report provides a clear picture with regard to the implementation of CEMP activities as well as the environmental outcome. The report serves the client, ADB and other organisations to understand the environmental management process, its outcome, the corrective actions that are required and the impact of such actions on the environment.

### **1.4 Methodology**

14. The six-monthly report is written using data gathered from several sources such as:

- a. Contractor's reports;
- b. Supervision Consultant's reports;
- c. Camp log-book;
- d. HRMG and PIU audits.

In addition, primary data has been gathered from discussions with project staff including contractor staff, government officials and meetings with the community.

15. The list of reports reviewed is in Appendix 1 whilst names of people interviewed are presented in Appendix 2.

### **1.5 Report Organisation**

16. The report consists of the foregoing introduction and 2 other sections as follows:

Section 1 – Introduction

Section 2 – Monitoring results and findings

Section 3 – Conclusions and recommendations

Appendices

## **2. Monitoring results and findings**

17. The main findings of monitoring including the assessment of environmental impacts during the review period are presented in this section. The construction activities completed during the reporting period are given as a backdrop.

18. The construction works undertaken during the review period include clearing and grubbing, cut and fills to provide the designed road formation, cutting slopes, filling and embankments, works on culverts, drainage and, laying of base coarse materials and its compaction. A new camp has been built in Tambul whilst the existing camp built during Mendi-Kandep road construction is being utilized at the Mendi end of the road. The camps are utilized for staff housing, offices, storage of equipment, fuel and other materials. The original alignment has been re-aligned in 4 and 6 sections in Tambul and Mendi areas respectively, after reaching an agreement with the community members witnessed by the local MP for the area. The re-alignment has not triggered additional environmental concerns where trees were not affected as the new sections passed through grassy areas.



19. The basis for monitoring is the parameters listed in the CEMP of which there are 15 as follows:

- Contractor's camp and yard
- Erosion and sedimentation
- Water quality
- Air quality
- Noise
- Waste management
- Hazardous material management
- Aggregates extraction
- Tree removal and vegetation management
- Socio-economic issues (workers)
- Socio-economic issues (community)
- Public safety
- Health and safety issues
- Traffic management
- Prevention of HIV/AIDS and STDs

20. In addition to above parameters, information on the following activities are included in the SMR.

- Information on public consultations by the contractor;
- Management of environment-related grievances;
- Benefits to the community; and
- Institutional arrangements.

## **2.1 Contractor's camp and yard**

21. As mentioned earlier, the contractor built a new camp at Ande (chainage 13+00) in Tambul side while the existing camp built for the rehabilitation of the Mendi-Kandep road at Mopa has been refurbished. The contractor divided its employees into two teams. Team one based in Mendi has been assigned the section from Ch. 00 + 000 to Ch 27+000. The second camp at Ande (chainage 13+100) has been new-built where the team working in Tambul side is being housed. This camp is on an old cattle farm which was abandoned and later used for planting potato and broccoli, but left vacant for 15 to 20 years. As such, there was no disturbance to the environment such as removal of trees and shrubs but grasses were cleared for the establishment of Ande camp. However, people from the surrounding villages complain regarding the improper disposal of septic waste from the camp into the stream used by people living downstream. The contractor has been instructed to fix this issue as a matter of high priority where the work is in-progress during the reporting period. The Corrective Action Request (CAR) on this issue has been issued to the contractor on 16<sup>th</sup> January 2017. The Appendix 3 has details.

22. The land for each camp site is under customary ownership where the contractor had already entered into written agreements for the use of land based on a monthly payment to the landowners. Both camps are fully equipped with workers' accommodation, workshop, and office complex and store rooms. In addition, one yard is being used for the storage of construction equipment and stockpile materials in Tambul side whilst a new yard has been installed in Tambul side for the same purpose. The camps were fully fenced where the contractor employed security guards as well as CCTV cameras for the protection of machinery and equipment as well as for the control of visitors. Each camp provides staff

accommodation, kitchen facilities, toilets and office space. Issues such as poor camp hygiene and run-down facilities for the local workers have been pointed out by HRMG and PIU, which are being fixed by the contractor.

23. It has been highlighted by CSC, HRMG and PIU that proper accommodation for the national workers should be built with safe drinking water, kitchen facilities with septic toilets. The toilets at Mopa camp do not meet with the requirements as reported in the previous SMR. Waste water generated from the camp is diverted to a natural stream where the community has raised concerns. Both issues are now over-due where the contractor has been advised to fix it immediately. The CAR has been issued to the contractor on 16<sup>th</sup> January 2017 whilst details on the same issue are included in the Appendix 3.

24. Ande camp has new facilities for the employees where the worker facilities are at a higher level. The two areas of non-compliance with CEMP are the disposal of waste water and solid waste management. As stated in paragraph 21, the grey water is diverted to a natural stream feeding into Ande River which is non-compliance. Kitchen and workshop waste is dumped or is burnt which is non-compliance. The CAR details are in Appendix 3.

## 2.2 Erosion and sedimentation control

25. The erosion of soil erosion and its sedimentation has been reported from clearing and grubbing as well as cut and filled areas. The project located on a rolling to hilly landscape inevitably generates soil erosion from cut surfaces, filled areas and other open grounds. In some areas, the soil erosion rate had been high where the contractor implemented corrective measures such as drains, gabion baskets, cutting benches and the establishment of line drains. In areas with moderate slopes, the control measures were adequate to minimise soil erosion. On the other hand, soil erosion was high from higher gradients where the adoption of control measures has not been effective.

26. Various reports point to sedimentation concerns occurring in streams, agricultural lands and on other pathways. In some sites, the sedimentation has been so severe that it impacted on food gardens (Figure 1). The management of sedimentation during the review period has been weak. This matter will be followed up in the forthcoming SMR.



Figure 1 : Sedimentation on food gardens at Chainage 19+

### **2.3 Water quality**

27. The baseline data on stream and river water quality along Mendi – Tambul road was not measured before the construction works began. The IEE stated that there are large numbers of streams and a few rivers that cross the road alignment where water is clear all year round. The water turned turbid during the rainy months that became normal in the dry season. The contractor has been instructed to conduct such measurements prior to work commencing in the section where civil work has not begun as yet. In the absence of actual measurements, water quality was assessed through visual observations. The construction works have changed the colour of water in streams (due to high-level of suspended silt load) and two rivers adjacent to the road alignment. Near the Ande Camp where materials are stored, there had been reports of low water quality due to the leakage of oil and lubricants into the Ande River. The sewage water from the camp had been allowed to escape into the nearby stream untreated, that may also have impacted water quality (see CAR details in Appendix 3). As the quality was not monitored based on chemical analysis, it is not possible to conclude on impacts on water quality. The impacts were temporary as water quality improved after the completion of works. However, there was no complaint from the people living near the main river and other streams regarding the deterioration of water quality.

28. The natural stream and river courses never changed their directions as a result of construction activities.

### **2.4 Air quality**

In general, air quality had been satisfactory as construction works did not have any long-term impacts on air in the construction zone. There had been occasions where air quality had been poor due to dust particles produced by movement of vehicles and road waste dumping activities during the dry season. The air quality in and around quarry areas were reported to be low, mainly due to dust particles and soot generated from heavy machinery. As the quarry is located away from the community, there were no adverse impacts on people. The impact on air quality confined only to the construction months as it remained good (visually) after works completion.

### **2.5 Noise**

29. There were reports from the community on the high noise levels. The contractor managed this impact effectively through the adoption of measures such as frequently checking all machinery and vehicles for noise generation and the fixing of mufflers, etc. In a few instances, at the request of the community, construction works re-scheduled for day-time. The baseline data on noise levels will not be collected now. However, the noise level will be monitored against the threshold values presented in the CEMP. The equipment for noise level monitoring has been ordered.

### **2.6 Waste management**

30. The wastes generated from construction works are of three main types namely, overburden from construction site and quarry sites, camp wastes and hazardous material. The over burden generated from road sides was dumped in designated areas after reaching agreements with relevant land owners. There were several requests from land owners to dump road wastes into their land and level the grounds. In such cases, the contractor supplied waste material to land owners at free of charge. However, there have been few cases where road waste allowed roll-down slopes damaging gardens and streams (Figure

2). Chainage 51+167, In another case at chainage 19+100, the contractor dumped waste at the door-step obstructing the movement of households. The contractor has been instructed to resolve such issues immediately where the outcome has been unsatisfactory. The contractor has been notified to correct this issue on 20<sup>th</sup> September 2016.



Figure 2 : Dumping of Road side waste at Chainage 51+167



Figure 3



Figure 4

Figure 3 : Road overburden obstructing a house

Figure 4: Grey water discharge at Ande Camp

31. The solid waste generated from Ande Camp is dumped nearby causing menace to people. The mix of waste could cause ground water contamination. The notice to correct this non-compliance issue has been notified to the contractor on 20<sup>th</sup> September 2016.

32. The wastes generated from quarry sites were used to fill depressions at the request of relevant land owners. In any case, such material was disposed without any impacts on the community. There were no adverse reports from the community with regard to the dumping of quarry wastes.

## 2.7 Hazardous materials management

33. The haze waste generated from construction works were the bitumen, paints and lubricants. All such materials were contained in contractor's yard with controlled entry to

people. There was an incidence where bitumen leaked from the bitumen burning plant. The contractor on reporting impacts quickly cleared the area and made it safe for the people. Minor leakage of fuel and lubricants from the camp were removed by the contractor without creating adverse impacts on the environment. There was no report of any injury or life impairment to community members from haze wastes disposal.

## 2.8 Aggregate extraction

34. Three quarries located at change 55+53 and Alu quarry at 13+000 (both new) and the existing quarry at Mopa have been in operation during the review period. All material required for construction works is expected to be removed from the 3 quarries. The contractor also extracted materials from Ande River (CH 44+446). The Alu Quarry was closed down during the review period as the distance where material has to be transported was found to be uneconomical. The material extracted was crushed at the quarry itself and transferred to batching and stockpile areas as required. Only two quarries have QMP approved by the client whilst the contractor has not produced a QMP for Ande quarry. As a result, the monitoring of quarry management had been a problem throughout the extraction period. The HRMG and CSC are conducting frequent site visits to ensure that quarry operations are properly monitored in order to minimize impacts on the environment. The contractor has been issued with the CAR on the Ande Quarry on 16<sup>th</sup> January 2017 (See Appendix 3 for details)

35. The environment damage from the 2 quarries at Ekari (Ch 55+530) and Kagul (Ch 13+000) were evident where waste material followed a free-fall. It was not possible to minimize this damage due to the location of the quarry in a hilly landscape. The damage was to the adjacent land where forest stood including edible pandanus and ficus damaropsis. The quarry operation at Ande River caused the deterioration of water quality (Figure 5). However, the river water became normal after the completion of material extraction.



Figure 5 : Dirty water (low quality) at Ande River due to material extraction

36. People living near Kagul quarry site were relocated about 50 M away as their presence near the site was deemed to be unsafe. The families were paid compensation by the contractor and relocated.

37. All quarries will be closed up after the end of the construction works, subject to request from quarry owners. Some owners want the quarry to remain open so that they can continue to sell materials to other interested parties to generate income.

## 2.9 Trees removal and vegetation management

38. A number of trees were removed from the Right-of-Way to pave way for road construction. In addition, several trees have also been removed from quarry sites the Alu Quarry which is a new site. Many trees were removed in accordance with the resettlement plan where APs received compensation. In the meantime, there were other trees removed in order to pave the way for construction works. The actual number removed is unknown as there had not been records kept by the contractor.

39. The contractor is currently preparing a re-vegetation plan for implementation after the completion of road works. This plan will be reviewed by ESSU before rolled over to implementation. In the meantime, community by itself has planted trees in chainage 16 who have been educated by contractor staff (Figure 6).



Figure 6 : Tree replanting at Enep village

## 2.10 Socio-economic issues (workers)

40. The CEMP contained socio-economic issues of three types. This includes health and safety issues of workers, establishment of the Public Relations Unit and HIV/AIDS and STDs control program. The compliance of above three aspects with the CEMP is discussed below.

### A. Workers health and safety

41. All construction workers are required to be present on their respective stations until 6.00 pm. The employees are advised not to engage with affairs of the community. The employees were advised on camp rules including the prohibition of removal of fauna, flora and fuel wood from the local forest areas. There had not been any social issues or concerns by locals against the employees during the reporting period. The entrance to camp and yards are controlled by private security guards where entry of any unauthorised person into these premises is not permitted. Each employee was issued with personal protective equipment (PPE). However, during inspections, it was obvious that the employees were not wearing PPE items (Figure 7). The contractor has been instructed to make it compulsory for all its employees to wear PPE whilst at work (see Appendix 3 for CAR). The matter will be monitored aimed at an appropriate solution.



Figure 7 : workers at Ande camp without safety PPEs

## **B. Public Relations Unit**

42. The contractor established the Public Relations Department where 2 PROs and 9 CROs have been working. Of them, 1 is a woman CRO recruited by the contractor at the request of PIU in the previous quarter. The PRO/CROs worked closely with the community to provide them with the information as appropriate and to work between community and the contractor. They conducted community meetings to explain about construction progress as well as to keep the community informed about construction activities that may have an impact on the community. They were also deployed to inform community about the grievance redress mechanism as well as to collect such information for reporting. The data on meetings conducted and participants have not been kept for reporting.

## **C. HIV/AIDS and STDs**

43. The contractor was tasked to prepare a HIV/AIDS and STDs control plan. This had been done and submitted and cleared by the CSC and finally approved by ESSU. The Plan is being executed by a private service provider. All workers went through basic HIV/AIDS training and are issued with condoms for their own protection. In addition, two sign posts were erected to convey vital information to the public about HIV/AIDS.

### **2.11 Socio-economic issues of community**

44. There was an accident where a girl was electrocuted as she climbed up on an unsecured stock pile that touched the live electric lines. The issue is being settled by the community, the contractor and local government. The contractor since then has restricted public access to all work sites and storage areas because of this incidence as well as for future occurrence.

45. Several members of the community have received income from employment in construction work. In July 2016, Kina 155,000 has been paid to locals for temporary employment. The project manager confirmed that women participation in the project implementation activities has increased after the recruitment of a woman CRO. More women are now approaching the woman CRO and request for work and also bring their issues and grievances to be redressed. In addition information dissemination is made easier for women.

46. The contractor purchased various items such as garden produce, fruits, crafts, live animals and local construction materials (poles, sand, etc.) from the APs and other community members. Records on community benefits including amount in Kina spent to purchase from the community reveal that 30 % of the requirement of food are purchased from the community. On average, about Kina 7,000 per month is paid out to the community to purchase food items.

## **2.12 Traffic management**

47. The contractor had prepared and implemented a traffic management plan. The local community members were employed (see photo 8) to hold “GO” and “STOP” signs throughout construction period. The traffic management was in order where there were no major issues or accidents reported during the review period. Moreover, sign posts to the approach of the camp, quarry sites other risk sites were established by the contractor.

## **2.13 Consultations**

48. Several community meetings and public consultations were planned and conducted by PRO/CROs. The purpose of these events was to inform public on construction plans, receive their feedback and to seek their assistance to resolve environmental impacts created by the project. However, the data on such events are not available for reporting.

## **2.14 Environment-related grievances**

49. There were few grievances received from people along the road on the matter of damages caused to their property and assets by waste dumping. These have been assessed by GRC. The contractor has already undertaken to correct damages caused by its negligence as demanded by HRMG.

50. The Grievance Redress Committee (GRC) inclusive of 6 members has been established on 28<sup>th</sup> April 2015. The GRC conducted several meetings to resolve various environmental issues that emerged during the construction works. All outstanding environmental issues (except for problems caused by natural landslides) have been resolved.

51. As part of grievance redress process, awareness executed among APs has been undertaken during the review period. One CRO was working on both awareness creation and to provide initial response to Aps with regard to their grievances. This activity focussed on those who have not yet submitted their grievances, the majority of whom were found to be vulnerable. The APs were also explained about the process of handling environment-related grievances including the timeline to provide resolution to their grievances.

## **3. Institutional Arrangements**

52. The institution responsible for the implementation of CEMP consists of (i) contractor, (ii) construction Supervision Consultant, (iii) HRMG assisted by PIU in collaboration with ESSU. The contractor is responsible for the execution of the environmental management of the project as specified in the CEMP. The role of CSC is to ensure that contractor manage the environment, conduct site monitoring and to approve the invoice for payment. The CSC also provides instructions to the contractor with regard to overall management of the environment and provides advice to the team. The role of HRMG is to resolve land owner issues, provide facilitation of the construction program, conduct audit and issue CAR notices to the contractor.



53. Table 1 presents staffing and monitoring arrangements for the implementation of CEMP for this sub-project.

Table 1: Staffing and reporting roles for execution of CEMP

Institution	Staffing (number)			Reporting
	Management	Environment	Field	
Contractor	2	2	5 PROs	Following reports on a monthly basis: <ul style="list-style-type: none"> <li>• Construction progress</li> <li>• HIV/STD plan</li> <li>• Environment management</li> </ul>
Construction Supervision	1	2 <sup>a</sup>	None	<ul style="list-style-type: none"> <li>• Monthly environment monitoring report</li> </ul>
HRMG/PIU	3	2 <sup>b</sup>	2 CROs	Quarterly report to EA
ESSU	1	2 <sup>c</sup>	None	Review and submission of SMR to DOW/ADB

## 4. Conclusions and Recommendations

### 4.1 Conclusions

54. The main conclusions arising from environmental monitoring activities during the review period are:

- The construction works commenced after the approval of the CEMP where it is monitored by CSC, HRMG and PIU consultants in association with ESSU staff. Except for non-compliance in few areas, the construction activities follow the standards established in the CEMP;
- All relevant staff has received training on the preparation and monitoring of CEMP conducted by the safeguards specialist. This has been very useful for all concerned;
- A follow-up training was provided to PRO and all CROs in the two camps focused on environmental monitoring and consultations;
- Several areas of non-compliance have been observed where the contractor has been instructed to correct them. The non-compliance has been observed in respect of soil erosion, sedimentation, camp sewer and solid waste management, controlled public access to construction sites and quarry operations. Some non-compliance activities have been corrected whilst the contractor is in-progress with regard to others. The contractor has been instructed to fix immediately soil erosion and sedimentation hot-spots. In the meantime, QMP for other operational quarries has not been furnished;
- The order placed by the contractor for the supply of PPE equipment and baseline equipment to collect environmental data has not arrived yet. Accordingly, workers do not have PPE equipment and the baseline environment data has not been established;
- The short-term environmental impacts such as high river turbidity, noise and dust created at the time of construction are now stabilised. There are no permanent issues on air quality, noise and water quality resulting from construction works;
- The environmental-related grievances have been resolved by the GRC. All valid grievances are being acted upon by the contractor;

55. Based on the above conclusions of internal monitoring, it is recommended that further actions are pursued as outlined in the next section.

## 4.2 Recommended actions

56. The summary of proposed actions to address issues and other relevant information are provided in the Table below. The details are presented in Appendix 3.

Table 2 : Corrective Action Plan

Serial No.	Item and Corrective Action	Responsibility	Completion Date (Planned)
1	Continue with environmental monitoring until project completion date on 24 <sup>th</sup> July 2018	Contractor/CSC/ /HRMG/PIU/ESSU	July 2018 Final safeguards monitoring report is due after this date
2	Preparation of Plans as follows: <ul style="list-style-type: none"> <li>• solid wastes management</li> <li>• quarry management plan for 2 quarries</li> <li>• contingency and emergency response plan</li> <li>• re-vegetation</li> </ul>	Contractor to prepare CSC to review HRMG/CSC to monitor ESSU to approve	September 2018
3	Corrective actions as per approved CEMP on the following issues: <ul style="list-style-type: none"> <li>-Issue full-set of PPE materials to workers</li> <li>-Streamline solid waste and sewer disposal</li> <li>-Monitoring water quality, noise level and air quality</li> <li>-Fix all sites where excessive soil erosion and sedimentation occurred</li> </ul>	HRMG/CSC	September 2018 August 2016 September 2016  September 2016 September 2016
4	Semi-annual environmental safeguards monitoring report (Jan-June 2017)	PIU/ESSU	10 <sup>th</sup> January 2017 (finalized on 30 Jan 2017)

## Appendices

### Appendix 1 : List of References

1. Initial Environmental Examination for Mendi - Tambul Road section (2013).
2. Construction Environment Management Plan for Mendi - Tambul (March 2016)
3. Monthly Environmental Monitoring Reports (January to May 2016)
5. Contractor Induction Workshop Report (2016)

### Appendix 2 : List of People Interviewed

1. Ippio Acceri, Team leader, Construction Supervision Consultant
2. Alphonse Niggins, Senior Field Coordinator, HRMG
3. Joseph Maiya, Safeguards (environment) consultant, CSC
4. Paul Nombri, Manager, Technical Services, HRMG
5. Roselyn Isaak, Environmental Officer, HRMG
6. Newman Paraka, Environmental Officer, HRMG Mendi Office
7. Peterson Senoli Senior CRO, HRMG
8. Bob Jiang, Project Manager
9. Robin Wang, engineer
10. Water Leu, translator
11. Kaisan Mai, LO / ward councillor (A'rambo ward)
12. Peter Mondo, site engineer
13. Eki Pieso, surveyor
14. Peter Lee, COVEC accountant Ande camp
15. Chris Chen, accountant Mopa camp
16. Imbi Tapame, EO, COVEC

### Appendix 3 : Status of Corrective Action Requests

Serial No.	Description of Non-compliance Issue	Action and date	Remarks
1	The quarry at Ande River is operational without QMP. Complaints from community on poor water quality in the river due to material extraction	Notification for corrective action endorsed by FPM served to contractor on 16 <sup>th</sup> Jan 2017	Contractor previously agreed to rectify before 16 <sup>th</sup> December 2016. Has not complied with
2	Sewer discharge at Mopa Camp. Grey water is diverted to natural streams without any treatment		
3	Untreated sewer discharge into stream at Ande Camp		
4	Solid waste dumped near Ande Camp causes nuisance to adjacent community. Bio-degradable and non-degradable material not separated		
5	Poor living condition for local staff at Mopa Camp. Latrines are unhygienic, no separate toilets for male and females, poor overall living conditions		

6	PPE materials inadequately supplied to local workers		
7	Road waste material not disposed properly. Damage to vegetation and gardens i.e. chain 51+167; 41+500	Notice of violation issued to contractor on 20 <sup>th</sup> Sep 2016	Will be monitored in first quarter 2017
8	Extraction of materials at Ande River turned stream water murky chainage 44+446		