

Semi-annual Report

July 2020

PNG: Bridge Replacement for Improved Rural Access Sector Project.

Prepared by Project Implementation Unit, Department of Works for the Asian Development Bank

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**INDEPENDENT STATE OF PAPUA NEW GUINEA
DEPARTMENT OF WORKS**



BRIDGE REPLACEMENT FOR IMPROVED RURAL ACCESS SECTOR PROJECT

Package 1: Hiritano and Magi Highway

Package 2B: New Britain Highway



ENVIRONMENTAL SAFEGUARDS MONITORING REPORT

(July to December 2018)

**Project Implementation Unit
Department of Works
National Capital District
Papua New Guinea**

July 2020

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Abbreviations

ADB	- Asian Development Bank
AP	- Affected People
BRIRAP	- Bridge Replacement for Improved Rural Access Sector Project
CEMP	- Construction Environment Management Plan
CEPA	- Conservation and Environment Protection Authority
CHEC	- China Harbour Engineering Company
CLO	- Community Liaison Officer
DBST	- Double Bitumen-layer Surface Treatment
DCSC	- Design and Construction Supervision Consultant
DOW	- Department of Work
EA	- Executive Agency
EMP	- Environmental Management Plan
EO	- Environmental Officer
ESSB	- Environment and Social Safeguards Branch
GoPNG	- Government of Papua New Guinea
GRC	- Grievance Redress Committee
HCRN	- Highland Region Core Road Network
HIV/STDs	- Human Immunodeficiency Virus/ Sexually Transmitted Diseases
IA	- Implementation Agency
IEE	- Initial Environment Examination
LLG	- Local Level Government
MOA	- Memorandum of Agreement
NCD	- National Capital District
NEC	- National Environmental Consultant
PIU	- Project Implementation Unit
POM	- Port Moresby
PWM	- Provincial Works Manager
PNG	- Papua New Guinea
PPE	- Personal Protective Equipment
ROW	- Right of Way
RP	- Resettlement Plan
SPS	- Safeguard Policy Statement
TOR	- Terms of Reference
WGJV	- Wildcat and Golding Joint Venture Limited

1. Introduction

1.1 Background

01. The aim of the Bridge Replacement Project is to replace aging and single-lane bailey bridges and other badly deteriorated bridges on the National Highways in Papua New Guinea (PNG) with double-lane permanent bridges. The Project is being implemented in the Central and New Britain Provinces covering the replacement of 27 bridges that include: 17 bailey bridges, two steel truss bridges, and three steel plate girder bridges, two log bridges, two cause ways and one River Bed Crossing. Twenty-two (22) of the existing bridges are reusable on the Provincial or district roads impacted by these National Highways.

02. The Government of Papua New Guinea (GoPNG) has negotiated a loan with the Asian Development Bank (ADB) to implement the Bridge Replacement for Improved Rural Access Sector Project (BRIRAP). Under the project, a total of 18 bridges are expected to be replaced. The Execution Agency (EA) for the project is Department of Works (DOW) whilst the Project Implementation Unit is the Implementation Agency (IA).

03. The Project is implemented in 2 packages. The Package 1 has total of six (6) bridges, three (3) along the Hiritano Highway (Laloki Bridge, Brown River Bridge and Angabanga Bridge) while the other three are along the Magi Highway (Dogona, Kokebagu and Sivitata). The figure 1 has details. The Package two (2) project involves a total of twelve (12) Bridges (Korori, Ubai, Marapu, Otutabu, Aleeu, Kiava, Lobu, Koloi, Soi, Pika, Imana and Ulamona) along the New Britain Highway in the West New Britain Province and the Contractor is a joint venture between Wildcat and Golding (WGJV), that has terminated due to contractual issues and the project was re-tendered. The Re-tender was won by China JiangSu International Economic & Technical Cooperation Group Limited (CJETCGL) or in short referred to as "CJI".

04. The contract for replacement of bridges in Package 1 has been awarded to the China Harbour Engineering Company (CHEC). The construction period for Package 1 is 24 months which began on 24th February 2015 and is scheduled for completion on 23rd February 2017. The projection construction was completed in August 2017. The design and construction supervision has been assigned to Chodai Company Limited for both packages.

05. The construction works under Package 2 began on 24th February 2015 which is scheduled for completion on 23rd February 2017. The contractor for package 2 is executed by WGJV where the progress is 44.80 % during the review period. The Contractor was terminated due to contractual issues in 2017.

06. In April 2018 the Project name under Package 2 was changed to Package 2B when it was awarded to CJI. PIU issued letter to commence work to CJI. Immediately receiving they mobilized to site and actual construction commenced work in August 2018.

1.2 Project Description

07. The Hiritano Highway that begins from Port Moresby has a total of 256 km. It is the main link road of Kerema in the Gulf Province with Port Moresby (POM) in the National Capital District (NCD). This highway has 29 bridges of which 3 are under the BRIRAP. The highway has been rehabilitated recently but the aging bridges were not replaced. All three bridges are a significant bottleneck for the fast movement of traffic in this recently rehabilitated highway.

08. The Magi Highway has a distance of 225 km that passes across 25 bridges. This highway too has been rehabilitated recently. As in the case of the Hiritano Highway, the

bridges in the Magi Highway were not rehabilitated causing significant traffic delays and posing safety risks to pedestrians and traffic. Some of the bridges pose a safety risk to moving traffic and pedestrians as they are over 25 years old.

09. The New Britain Highway covers a distance of 229 km. It is the main transport corridor that links West and East New Britain provinces. The highway is the main route to transport commodities such as palm oil, sea food, timber, etc. produced in the New Britain Island to the seaport at Kimbe. The New Britain Highway has been rehabilitated in early 2000s but none of the bridges were included in the program due mainly to lack of funding at that time. The BRIRAP is replacing 12 out of a total of 39 bridges in this highway.

10. The previous Contractor (WCGJV) procured all the materials and started construction works but due to poor performance the Contract was suspended and eventually terminated. Out of the 12 Bridges only two bridges were nearly completed by over 60% while Lobu, Otutabu and Marapu were completed up to 38% plus. The rest were below the 32%. CJI was given the letter to commence work on the 13th August 2018 and started work immediately but at a very slow phase, hence the following results portrayed in Table 01.

11. Table 1 provides information about the bridges that is the focus of this project.

Serial No.	Bridge Name	Chainage	Span (M)	Construction Progress as at 30 June 2016 (%) completed)	Construction by as at 30 th December 2018
Package 1					
1	Dogona	62.7	25	26.58	100
2	Kokebagu	77.6	25	54.58	100
3	Sivitatana	80.7	25	40.71	100
4	Laloki	0+0	80	73.34	100
5	Brown River	22.5	80	79.14	100
6	Angabanga	141.1	160	76.81	100
Package 2B					
1	Ulamona	8.4	20	6.42	0
2	Ibana	20.0	40	15.0	0
3	Pika	30.7	40	28.19	0
4	Soi	35.3	30	20.13	5
5	Koloi	49.0	40	32.03	10
6	Lobu	52.5	40	39.80	10
7	Kiava	88.2	25	69.73	0
8	Aleeu	94.1	15.2	60.53	3
9	Otutabu	107.1	40	39.13	0
10	Marapu	135.1	30	38.25	0
11	Ubai	150.1	30	22.97	0
12	Korori	157.1	25	30.47	3

12. The environmental impacts assessed at the time of preliminary design categorised bridge sites under Package 1 and 2 (now package 2B with a new CEMP submitted by CJI in August 2018) as Category B for environment. The same category was confirmed by the in-depth environmental analysis conducted at the time of detailed design. The Initial Environment Examination (IEE) documents for both packages have already been disclosed in the ADB web site. The IEE confirmed that the corridor in which the bridges will be replaced is already highly

disturbed primarily by extensive oil palm plantations in West New Britain Province and mixed plantations and bushes in Hiritano and Magi Highway. There will be no significant loss of vegetation, primary forest and no conservation areas will be affected. No cultural or heritage will be affected. Accordingly, environmental impacts of the rehabilitation of all bridge replacement works 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 and are confined to local area.

13. The key-issues of the IEEs for the two packages are summarised in the following Table.

Table 2: Key-information on Initial Environment Examinations

Package	IEE Submission (Date)	CEMP Approval (Date)	CEMP Commenced Implementation (Date)
1 – Hiritano and Magi Highway	Sep 2013	13 th May 2015	May 2015
2- New Britain Highway (NBHW)	Nov 2013	24 th Oct 2015	Oct 2015
2B – NBHW	21 August 2018		August 2018

14. Based on the EMP presented in the IEE, a construction environment management plan (CEMP) was prepared by the contractor. The CEMP was reviewed by the National Environmental Consultant (NEC). Prior to preparation of CEMP, training was provided to contractor staff. Package 1 construction was completed and therefore environment monitoring report has not been conducted. The package 2 CEMP was submitted, approved and well executed by the Contractor. CEMP for Package 2B was submitted and approved by DOW. Implementation of the CEMP under package 2B has few problems which the Supervising Engineer and DOW have been working with the contractor to improve. However, in general the environment management in BRIRAP Package 2B saw a substantial improvement after recruitment of an Environment Officer (EO).

15. 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 environmental monitoring including the establishment of environmental baseline.

16. Internal monitoring has been conducted by EO of the contractors whose work is overseen by the NEC of DCSC. Monitoring reports are prepared on a monthly basis by the contractor (Environmental Officer) which are reviewed, and feedback conveyed to the contractor for improvement. The current semi-annual environmental monitoring report is prepared by the EA for disclosure by ADB.

1.3 Purpose

17. This report presents the status of environment including the compliance with approved CEMP in respect of the two packages under BRIRAP covering June to December 2018. Semi-annual environment safeguards monitoring reports 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

18. The six-monthly report is written using data gathered from several sources during the period of monitoring between July to December 2018. The primary data has been gathered from discussions with project staff (PIU), meetings with the community and site inspections and observations. The secondary data sources from Contractor and DCSC could not be extracted because they are no longer on site on the basis that construction works were completed in 2017.

19. No reports were reviewed for package 1 during the review period since the Project (Package 1) was completed. The contractor representatives and DCSC were interviewed and reports reviewed for Package 2, whose names are presented in Appendix 2. Also Photographs of construction works at Package 2 are presented in Appendix 3.

1.5 Report Organisation

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

- Introduction
- Monitoring results and findings
- Conclusions and recommendations

- Appendices

21. The above sequence is followed in respect of both packages and is presented in two separate sections of the report. The section 1 describes the management of the environment in Hiritano and Magi Highway bridge sites whilst section 2 discusses similar issues in respect of the New Britain Highway bridge sites.

Section 1: Package 1, Hiritano and Magi Highway

2. Monitoring results and findings

22. Package 1 construction works were completed in 2017, therefore specific environmental monitoring parameters were not monitored. The environmental monitoring has not been conducted during the review period.

23. Immediately after completion of civil works, all the equipment were demobbed and construction camp sites dismantled and taken to storage yards owned by the Contractor or transferred to other projects. The land occupied by camps were given back to the customary or legal owners.

24. The basis for which environmental monitoring would have been conducted are the following parameters listed in the CEMP of which there are 17 as follows: For the purpose of this report general information is provided for ease of records.

- Contractor's camp and yard
- Erosion and sedimentation

- Water quality
- Air quality
- Noise
- Waste management
- Hazardous material management
- Aggregates extraction, haulage and storage
- Tree removal and vegetation management
- Socio-economic issues (workers)
- Socio-economic issues (community)
- Public safety
- Health and safety issues
- Invasion of exotic weeds
- Chance discovery of archaeological find
- Traffic management
- Prevention of HIV/AIDS and STDs

25. There was no consultation with the people regarding environment or construction issues.

26. Discussed below is the status of performance of each of the above 17 parameters as well as community consultations and environmental grievances during the reporting period.

2.1 Contractor's camp and yard

27. The contractor in 2015 has built three new camps one at Kwikila, second one at Laloki and the third at Angabanga. The first camp occupied the land belonging to the Department of Works (DOW). The land in two other camps is under customary ownership. The contractor divided its employees into three teams and accommodated them in one of the three camps mentioned above. Each camp was secured by a wall and the contractor employed a security company to provide control access to the camp. There are no issues or concerns by the adjacent community on the management of the camp. As at the time of writing this report, the camp no longer exists. Customary owners are now using the land for their own use.

28. The contractor had entered into written agreements for the use of land occupied by the two camps. The monthly rent for the land was K8, 000 made payable to the customary landowner. All three camps were fully equipped with workers' accommodation, workshop, kitchen facilities, office complex; fuel storage and stock-pile area which are currently no longer there.

2.2 Erosion and sedimentation control

29. As a result of gabion baskets built by the Contractors as retaining walls and planting of crawling plants and trees are preventing soil erosion. The temporary sedimentation at the riverbanks have subsided over time and water is flowing freely.



Photo 2 Laloki Bridge Site preparation for planting grasses & trees

photo 3 Brown Bridge –No sedimentation

2.3 Water quality

30. The water quality during construction of the bridges have not been affected and remained intact after construction as seen in the following photograph:



Photo 4: See Natural water quality at Laloki immediately after construction.

31. The natural stream and river courses never changed their directions during construction activities.

2.4 Air quality

Natural Air quality observed as there are no construction activities on the 6 bridge sites during the reporting period.

2.5 Noise

Nothing to report as there is no construction work during the reporting period.

2.6 Waste management

32. As a result of good management of waste generated at the construction sites by way of collecting, loading and dumping at the selected dumping sites, there is no sign of waste leakage or waste exposure to APs. The APs are happy with the dumping sites and did not raise any issue to date.

2.7 Hazardous materials management

33. Nothing to report for this review period.

2.8 Aggregate extraction

34. The quarries were leased from customary owners to extract material for the bridge sites construction but were closed and given back to customary owners when the construction completed. Therefore, there is nothing to report during this review period.

2.9 Trees removal and vegetation management

35. Some huge rain trees used to be there before construction but were removed after paying the owners with cash as replacement costs. Plants, trees and grasses reclaimed the bridge approach areas that were cleared.

36. The contractor has been advised to prepare a re-vegetation plan for implementation after the completion of road works. This plan was reviewed by PIU and approved by ESSU prior to rolling over.

2.10 Socio-economic issues (workers)

Nothing to report during this review period as there are no construction works.

A. Workers health and safety

37. Nothing to report during this review period.

B. Public Relations Department

38. Nil activity during this review period.

C. HIV/AIDS and STDs

Nil activity during this review period.

2.11 Socio-economic issues of community

39. Nothing to report during this review period.

2.12 Traffic management

40. Traffic flow is very smooth on the permanent bridges therefore traffic management activity is not required, especially after completion of construction.

2.13 Consultations

2.14 No consultations were conducted during the review period.

2.15 Environment-related grievances

41. Two APs lodged complaints regarding water flow back during wet season that was allegedly affecting vegetables at Kokebagu and Sivitatana bridge sites due to poor drainage. DOW dealt with the APs and advised that they were wrong about their complaints.

2.16 Chance Discovery Archaeological Items

42. Nothing to report during this review period.

2.17 Introduction of Invasive Species

43. Crawling plants and grasses have been introduced to prevent soil erosion and they are performing quite well on all bridge sites.

3. Conclusions and Recommendations

3.1 Conclusions

44. Construction works have been completed in 2017 of which final monitoring report was the Safeguards monitoring that was submitted in December 2017 and defects liability period expired in August 2018. The Bridge sites are now considered completed and handed over to DOW.

3.2 Recommended actions

45. DOW will monitor debris entangled against the piers at the Angabanga Bridge and the regrowth of grasses and trees on the gabion baskets and the road approaches.

Section 2: Package 2, New Britain Highway

46. Discussed in this section is the status of the environment and management of CEMP in respect of bridge sites along the New Britain Highway.

4. Monitoring results and findings

47. The main findings of monitoring including the assessment of environmental impacts during the review period which is from June – December 2018 are presented in this section.

The environment impacts noted during the construction period especially from August – December 2018, are given as a backdrop.

48. The civil works undertaken during the review period were pile driving, abutment, gabion work, and placement of girders, bridge access road and embankments. The Bialla and Marapu camps that had been established by the previous contractor are now used by CJI for staff housing, offices, storage of equipment, fuel and other materials. A river-based quarry at Luvi is being used to extract gravel to be used in embankments.

49. The basis for environmental monitoring is the parameters listed in the CEMP of which there are 17 as follows:

- Contractor's camp and yard
- Erosion and sedimentation
- Water quality
- Air quality
- Noise
- Waste management
- Hazardous material management
- Aggregates extraction, haulage, and storage
- Tree removal and vegetation management
- Socio-economic issues (workers)
- Socio-economic issues (community)
- Public safety
- Health and safety issues
- Invasion of exotic weeds
- Chance discovery of archaeological find
- Traffic management
- Prevention of HIV/AIDS and STDs

50. In addition to above activities, the contractor conducted public consultations, managed grievances relating to environment and provided employment for people, both local and from other provinces.

51. Discussed below is the status of performance of each of the above 17 parameters as well as community consultations and environmental grievances during the reporting period.

4.1 Contractor's camp and yard

52. The contractor is making use of two camps, one at Bialla which is an old facility built for another project. The previous contractor built another camp at Marapu to accommodate workers and equipment required for bridge construction. Both are currently used by CJI. The land in Bialla site is on State land. Both camps are secured by cyclone fencing and the contractor has employed a security company to provide control access to the camp.

53. The contractor had already entered into written agreements for the use of land occupied by the two camps. The monthly rent for the land is Kina 5,000 paid to the registered landowners.

4.2 Erosion and sedimentation control

54. The soil erosion and its sedimentation in rivers has been reported from cut and filled areas as well as from bridge shoulders. The loss of soil is not huge except in the case of Soi and Koloï where the old bridges have collapsed. The control of soil erosion and sedimentation of rivers is a critical issue that should be effectively controlled due to the crystal-clear water that is present in almost all rivers beneath bridge sites. It is to be highlighted that all rivers from construction sites discharges into the Kimbe Bay in the Bismarck Sea that is rich in biodiversity and an important fishing ground. As such discharge of sediment-laden water escaped from construction sites can cause serious impacts to the marine eco-system of the Bay. The contractor has built gabion baskets and silt traps which need to be maintained satisfactorily to minimize the escape of silt into rivers.

55. The contractor has been advised to build siltation ponds to discharge sediment-laden construction water for settling before discharge back into the river. The settling ponds must be of sufficient capacity to hold water. The previous contractor may have built

4.3 Water quality

56. The baseline data on water quality for all rivers was not measured before the construction works began. It was noted that the water in all rivers is clear where it is necessary to minimize impacts from construction works. In the absence of actual measurements, water quality was assessed through visual observations. It was noted during the review period (June – Dec 2018) that there was no suspended solids or loose earth suspended into the river system. For mitigation purposes, geotextile was used to withhold loose earth into the river system. The spill offs of oils or any other fluids into the river system have been controlled and to date no reporting of such occurrence. To mitigate Oil spill into the river system, the Contractor has provided Oil booms and oil containment spoil kits. There were no complaints from the people living near the main rivers and other streams regarding the deterioration of water quality.

57. The natural stream and river courses never changed their directions because of construction activities.

4.4 Air quality

58. In general, air quality had been in satisfactory condition 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 mildly affected due to suspended dust particles produced by movement of vehicles and unloading of gravel during the dry season, especially at the road approaches. The contractor has used water spray whenever the air quality deteriorated due to construction works. The air quality in and around the quarry has been low, mainly due to dust particles and soot generated from heavy machinery. As the quarry is located away from the community and people's housing, there were no adverse impacts on people. The impact on air quality is confined only to the construction sites as it remained visually good after works completion.

4.5 Noise

59. There were no 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. To avoid complaints from communities at the construction sites, the contractor conducted Community

awareness when they wanted to use vibratory hammer and other heavy machinery, so the locals are aware of ongoing works.

4.6 Wastes management

60. The wastes generated from construction works was of three main types namely, overburden from construction site and quarry sites, camp wastes and hazardous material. The over burden generated from bridge sites was dumped at Hargy Land Fill. During the review period there was less work so little or no waste being generated ad removed.

61. The iron works, old timber removed from bridges and timber off-cuts have been kept within the yard prior to transporting to DOW's yard. The contractor plans to remove and dump them at the landfills or deliver to people in each community upon request.

62. The wastes generated from camps is temporarily stored before it is transferred to the dump site owned by Hargy Oil Palm Limited. There was no issue or complaints about camp waste disposal. The quarry waste also did not create any burden as the quarry itself is located away from areas inhabited by people and away from agricultural lands.

4.7 Hazardous materials management

63. The haze wastes generated from construction works were the bitumen, paints, waste oil and lubricants. All such materials were contained in contractor's yard with controlled entry to people. Waste oil and lubricants are collected by a company for free for recycle. There was no report of any injury or life impairment to community members from haze wastes disposal. Minor leakage of fuel and lubricants from the camp were removed by the contractor without creating adverse impacts on the environment.

4.8 Aggregate extraction

64. The gravel is extracted from the river-based quarry located at Luvi. This is an old site that has been used for material extraction in the past. It is expected that the volume of material to be extracted is below 100,000 cubic meters as such a permit is not required. The river gravel is strained by strainers and used as base course and sub-base material on the road approaches because during the review period the Crusher was not in operation due to mechanical issues.

4.9 Trees removal and vegetation management

65. Several trees were removed by the previous Contractor from the Right-of-Way to pave way for bridge construction. Some trees including ornamental and crop plants and oil palm trees were quantified and paid according to Valuer General's prescribed 2013 price schedule. No complaints were lodged by affected people.

66. The contractor has been advised to prepare a re-vegetation plan for implementation after the completion of road works. This plan will be reviewed by PIU and approved by ESSU prior to rolling over.

4.10 Socio-economic issues (workers)

67. The CEMP contained socio-economic issues of three types. They are health and safety issues of workers, establishment of the Public Relations Department and HIV/AIDS and STDs control program. The compliance of above three aspects with the CEMP are discussed below.

During the review period, HIV/AIDS plan was submitted to PIU and was under screening. The Contractor will implement the plan immediately after approval is granted.

4.11 Workers health and safety

68. The major concern identified during the inspection period was on the safety of workers on site. It was observed that there was lack of Personnel Protective Equipment (PPE) for workers because some of the workers PPE. Communication between the Chinese and local workers was a major concern and that appeared to be a major safety issue, where instructions and directions were not understood correctly. Representatives of the Contractor were informed of the strict requirement to put supply all personnel with PPE and that they must be worn on site every day on site.

4.12 Public Relations Department

69. The Public Relations Department established earlier was in-operation where 1 CLO is on duty. The PIU during the review period has instructed the contractor to recruit a woman CLO to facilitate more women engagement in project activities. The CLOs work closely with the community to provide them with the information as appropriate and to work between community and the contractor. The CLOs conducted community meetings to explain about construction progress as well as to keep the community informed about areas where their cooperation is required.

4.13 HIV/AIDS and STDs

70. The contractor is required to prepare a HIV/AIDS and STDs control plan. This had been submitted and cleared by the CSDC and finally approved by ESSU. The Plan is being executed by a private service provider. All workers were provided with basic HIV/AIDS training upon recruitment who were also issued with condoms. During the review period HIV/AIDS awareness and training of peer groups were not implemented as per their SGAP. Signposts were supposed to be erected, one at the first bridge and another one at the second bridge to was not done during the review period. A third one was to be at the camp sites to convey vital information to the public about HIV/AIDS, but the contractor failed. Contractor was advised during the review period that the contractor is obligated by the terms of the Contract to install the sign boards.

4.14 Socio-economic issues of community

71. Several members of the community in general have received income from employment in construction work. Three women have been employed CJI.

72. During the review period the contractor has not been fully engaged with the local communities on each bridge site. Records show that the previous contractor has had very good relations with the communities. To embrace that relationship, they purchased certain local products to the value of Kina 2,000. To maintain that relationship, DOW has advised them to purchase local products such as fruits, fish, crabs, chicken, and construction items (poles and sawn timber) from the APs and other community members.

4.15 Traffic management

73. The contractor had prepared and implemented a traffic management plan. The local community members (all men) were employed to hold "GO" and "STOP" signs. The traffic management was in order where there were no major issues or accidents reported during the

review period. Moreover, signposts towards approaching camps, work areas, quarry sites and other risk sites were established by the contractor.

4.16 Consultations

74. Several community meetings and public consultations were conducted by CLOs together with other project staff. 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 inclusive of damage to the environment. The issue regarding consultations is that gender-disaggregated data have not been collected. The contractor has been advised to collect such data for future reporting.

4.17 Environment-related grievances

75. 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 and mostly resolved.

76. The Grievance Redress Committee (GRC) inclusive of 4 members has been in operation during the review period. All outstanding environmental issues (except for problems caused by natural landslides) have been resolved.

77. As part of grievance redress process, awareness raising among APs has been undertaken during the review period. The CLO has been working on both awareness creation as well as to provide initial response to Aps regarding 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.

4.18 Chance Discovery Archaeological Items

78. There was no such discovery during the review period. The bridges are existing facilities that are being rehabilitated by the project. Accordingly, it is expected that such discovery is unlikely.

4.19 Introduction of Invasive Species

79. The risk of introduction of invasive species was carefully monitored by the contractor. All machinery and other equipment were thoroughly inspected prior to using on site.

5. Conclusions and Recommendations

5.1 Conclusions

80. 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 CSDC and DOW staff. Except for non-compliance in few areas such as in Korori and Soi sites, the construction activities follow standards established in the CEMP. The contractor has been instructed to correct all non-compliance works.

- All relevant staff has received training on the preparation and monitoring of CEMP conducted by the CSDC.
- The baseline data on water and air quality has not been taken as water quality is not relevant in 3 out of 6 sites. Because the equipment is not available, monitoring has been based on visual observations.
- 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. Sections where excessive soil erosion have taken place are being naturally stabilised.
- The environmental-related grievances have been resolved by the GRC. All valid grievances have been acted upon by the contractor.

81. Based on the above conclusions of internal monitoring, the construction activities are in order where there are no serious and permanent impacts on the environment. Few activities require corrective actions which are outlined in the next section.

5.2 Recommended actions

82. The proposed actions to address issues and other relevant information are provided in the Table below.

Table 5: Corrective Action Plan for Package 2

Serial No.	Item and Corrective Action	Responsibility	Completion Date (Planned)
1	Continue with environmental monitoring until the project is closed in 2020. Monitoring of the use of PPE by work force is to be enforced	Contractor/CSDC/ /DOW/ESSU	December 2020 Final safeguards monitoring report is due after this date
2	Corrective actions as per approved CEMP on the following issues: Maintenance of all soil erosion structures Count of trees removed and re-vegetation plan Data on public consultations	Contractor/SCDC	31 June 2019
3	Semi-annual environmental safeguards monitoring report (Jan-June 2019)	SCDC	30 th June 2019

Appendices

Appendix 1: List of References

1. Initial Environmental Examination for Magi and Hiritano Highway (2014).
2. Construction Environment Management Plan for Package 1 (March 2015)
3. Package 1, Monthly Environmental Monitoring Reports (January to June 2016)
4. Initial Environmental Examination for new Britain Highway (2014)
5. Construction Environmental Management Plan for Package 2
6. Package 2, Monthly Environmental Monitoring Reports (January-June 2016)

Appendix 2: List of People Interviewed for Package 1

1. Mathew Windi, Project Director
2. Alphonse Gande, Senior Project Engineer
3. Willie Asigau, Environment Specialist

Appendix 3: List of People Interviewed for Package 2

1. Mathew Windi, Project Director
2. Kulino, Team leader, Chodai Co. Ltd
3. Ohyama, Site Engineer, Chodai Co Ltd
4. Billy Wepi, Environment Officer, CJI
5. Natanais Marum, CLO
6. Willie Asigau, Chodai Environment Officer