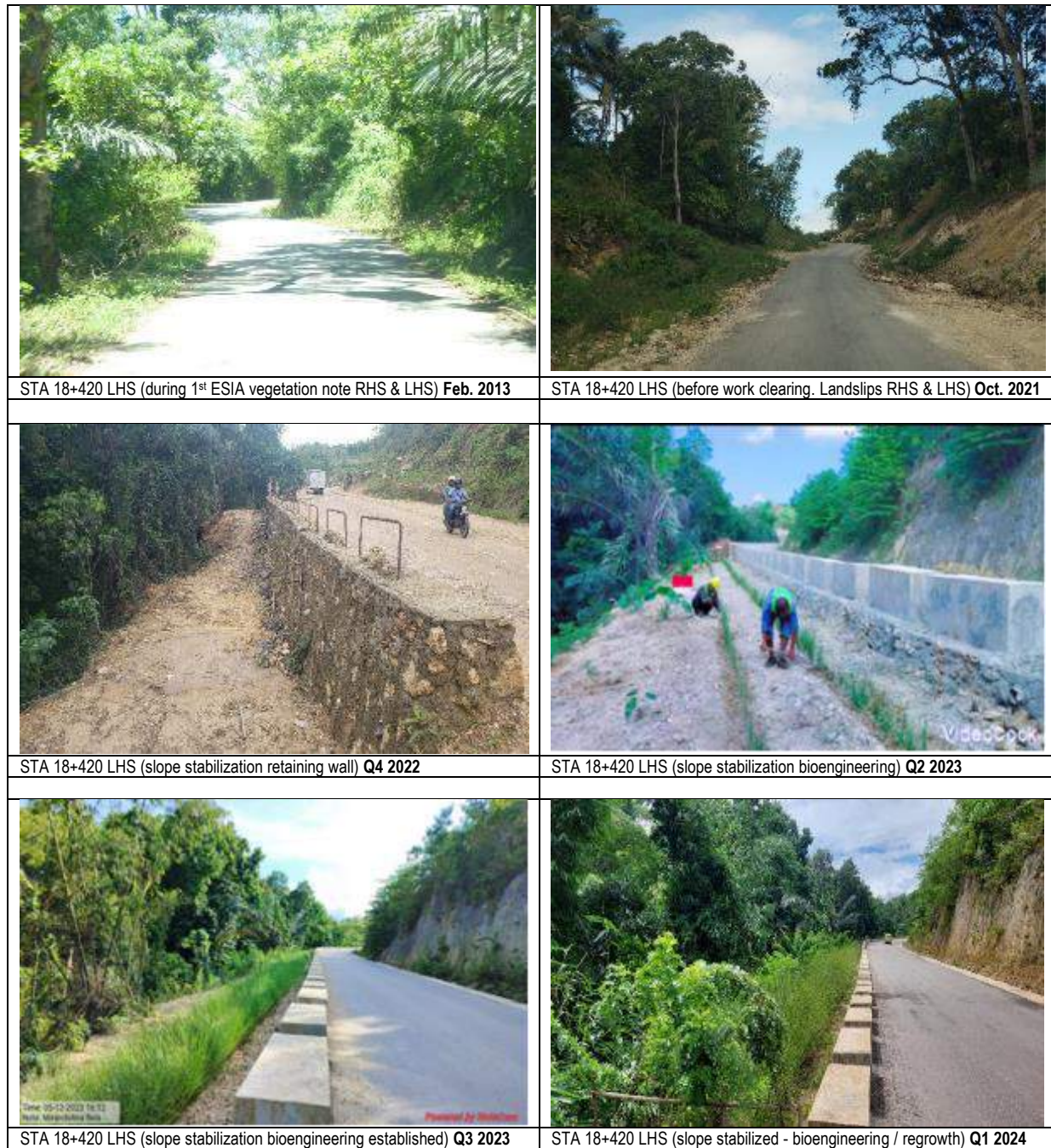


The Government of the Democratic Republic of Timor-Leste declared the Medium-Term Road Network Development Program (c2012). More than 20 project contracts (Figure 1) co-financed by development partners have been completed since 2014. The works have upgraded carriageway and drainage, improved road safety and enhanced the long-term durability and climate resilience of the roads. There have been gradual improvements in the implementation of ESIA requirements by Contractors due to an intensive programme of training and forced appreciation of the legal consequences of Contract and Bill of Quantities. Ensuring implementation of ESIA requirements has been a great challenge especially as several projects in different geographical areas were implemented simultaneously, and resources for monitoring and reporting were limited. Results over time have generally been encouraging. Since 2014 the Project Management Unit has conducted about 3500 site inspections, completed over 13,000 checklists and supervised presentation of about 700 monthly Environmental Monitoring Reports (mEMR). Semi Annual Environmental Monitoring Reports are presented to the development partners.

Figure 2. Road Improvements 2014 to 2024 (example) Baucau-Timor-Leste. Measures in BoQ.



Typically baseline survey, clearing & grubbing, construction and bioengineering, CEMP, HSP and TMP are included in BoQ.

The road network has undergone significant improvement (Figure 2). However, frequent landslides and road closures caused by intense rainfall and geotechnical instability in mountainous areas continue to create significant challenges to both road improvements and road maintenance. By including ESIA

requirements in the Contract and wherever possible in the BoQ significant progress has been made when combined with legal obligations and Loan covenants.

2 Reasons Environmental Capacity of Contractors is Limited and Remedial Actions

We suggest that ESIA Practitioners must appreciate that the driving concept of a Contract is that:

THE CONTRACTOR WILL DO WHAT THE CONTRACTOR IS PAID TO DO.

What can be done in the **Contract** and **Bill of Quantities** to maximize compliance with ESIA Requirements rather than restrict or negate them?

R1. Contractors' capacity may be compromised. Our experience suggests the Contractor will reduce or ignore inputs for ESIA requirements unless specifically required to do so. Therefore, ESIA requirements must be clearly included and attention drawn to them in the Contract and BoQ.

R2. Contractor no exposure to environmental principles. The Contractor's attention must be directed in the Tender to cost ESIA Requirements in the Bid. There must be a place in the Bid (a form) for the Contractor to declare it is included.

Figure 3. Extract from Matrix of Mitigation Measures in Tender (Total 300 MM - all activities)

Environmental Mitigation and Monitoring Plan - EMMP							
Example sourcing of construction materials				How to Focus the Bidder on the EMMP to understand TASKS			
Impact Mitigation				Impact Monitoring			
Project activities	Environmental Impact	Mitigation measures to be included in EMP	Mitigation Responsibility	Mitigation Cost (US\$)	Parameter to be monitored	Frequency and means of verification	Monitoring Responsibility
Activity	Impact	Mitigation Measures CEMP	Responsibility	Cost	Parameter	Verify	Monitoring
Sourcing of materials (river gravels, aggregates etc)	Extraction of river gravels from the beds or active channels of rivers changes hydrology, altering channel & causing erosion. Extraction from quarries or borrow pits leaves unusable land, exposed water table, attracts rubbish dumping, reduces visual values	<ul style="list-style-type: none"> Contractor to prepare river training and materials extraction plan as part of CEMP; Excavation for river training purpose should be conducted within the perimeters planned; All borrow soil should be sourced from materials excavated from the river training, subject to confirmation of suitability by laboratory testing; Stockpile topsoil for later use and fence and re-contour borrow pits after use. Properly remove topsoil, overburden, and low-quality materials and stockpile near the site to be covered and preserved for rehabilitation; In case additional material is sourced from river gravels, excavation shall not be conducted within 10m of the river bank or within 200m upstream or downstream from a bridge; Gravel and alluvial material shall not be removed to a depth of greater than 2m and holes in river bed shall be re-contoured when extraction is complete; Alluvial terraces or alluvial deposits which lie on the river 	MPW, Contractor, PMU	I/C	Materials only obtained from designated sites (locations and method) as per extraction plan; Rehabilitation is conducted as per extraction plan	Monthly - visual inspection; Review of extraction plan; Re-vegetation and rehabilitation	Contractor; PMU
Construction Material Sources							
21 MM in total							
<p>Link the Activity to Impact the Mitigation Measures and Responsibilities and Cost Parameter(s) to be monitored, Verification Frequency and Monitoring Responsibilities</p> <p>Contractors can relate the Activity to the Mitigation Measures needed and identify Monitoring activity needed to support and Adjust Resources and Commitment</p>							

ACTIONS.

- Include the Environmental Mitigation and Monitoring Plan (EMMP) in Tender as an annex to the Employers Requirements / Particular Specification.
- Set out the EMMP with construction by activity so the Contractor can recognize what they must complete. Include the mitigation measures (MM), responsibilities, cost and requirements for monitoring against the activity.
- Require Statement of Commitment in Bid that Contractor will comply. Provide Bid Form.
- Include an Environmental and Social Performance Security (as a deterrent).
- Require full time Environmental and Safety Officer on the Contractor staff –point of contact for the Supervision Consultants Environmental and Safety Consultant.
- Requirements for daily, weekly and monthly reporting on Environmental and Safety issues across all activities.
- Simplify Contractor reporting by use of joint inspections and checklists. Include all checklists in monthly Environmental Monitoring Reports.
- Ensure Employer has access to all sites and installations for inspections at any time.

- I. Requirement for full time supervision by National Environmental and Safety Consultant staff – day to day work site supervision, toolbox talks, check-lists with Contractor for environmental mitigation, progress with licenses, permits to work, liaison with community.
- J. Requirement for intermittent training and supervision by International Environmental and Safety Consultant – three times per year – training all environmental team and checking quality of supervision and mitigation, preparing corrective actions, quarterly monitoring reports, EHS training for Contractor, checking environmental mitigation, progress with licenses, permits to work, liaison with community.

R3. No experience: Environmental Management in Contractor's home country often weak and there is little or poor enforcement of environmental laws. The Contractor has no direct experience with Internationally Bid Contracts and environmental requirements.

R4. Not involved in the bidding process: Contractor construction team on site are blind to the ESIA requirements. The team making the Bid will almost certainly NOT be the team constructing the project. Construction contractors and sub-contractors on site do not know these requirements exist.

ACTION J. Contractor must be trained in the Pre-Construction stages in ESIA requirements. Can be responsibility of the Supervising Consultant (guided by Employer). Harmonized training, Project by Project, will facilitate consistent interpretation.

ACTION K. Contractor construction team must have a dedicated experienced environmental officer (EO) as a focal point and be instructed in the Pre-Construction Phase. Include potential deductions / non-payment in the Contract if such key are staff not engaged or replaced quickly.

R5. No harm in not complying: If the Contractor is complacent then the Employer must leverage some kind of penalty.

ACTION L. Include specific payment in the BOQ in the Pre-Construction Stage for Contractors Environmental Management Plan, Health & Safety Plan and Traffic Management Plan to be agreed and endorsed by Supervision Consultant and Employer (updated as necessary for unforeseen impacts)

ACTION M. We included a separate Environmental and Social Performance Security that must be provided before construction work can commence.

3 Progress towards inclusion of ESIA Requirements in Contracts and BoQ

Initially (c2014) the tender and bid documents only covered general environmental requirements "to protect the environment" in Timor-Leste's Road Construction Specification and Special Provisions of Contract. Requirements were scattered through the construction activities in the Specification with only a general wording. Minor details were added c2016 "to remedy damage to the environment as far as practicable at Contractor's cost if required by the Engineer". This approach was weak.

With the introduction of the FIDIC Red Book 2017 and with support of development partners, compliance with ESIA was required to limit environmental damage.

4 Including Requirements in the Tender and Bid

Starting from a very low base of ESIA requirements in Contracts we were able to convince the employer and procurement agency that including more detail would improve likelihood of the Contractor factoring the requirements into their bid and complying. The following are examples of the main initiatives (from c2014) that have gradually increased the traction of ESIA Requirements in Tenders and Contracts.

1. Bid included ESIA Requirements – (beginning c2014 with requirements - EMP in Bid supported by ADB / WB) but implementing department excluded for Bid Evaluation.
2. Bids include Statement that Environmental Management Plan requirements have been costed in the Tender Bid (not BOQ) (2016)
3. Environmental & Social Commitment Plan with bid (general statement 2017) acknowledging responsibilities. Environmental and Social Framework (WB ESF 2018) makes it a requirement.
4. Name, details & experience (C.V.) of proposed Environmental & Safety Officer (key staff c2019).

Figure 5. Extract from Bill of Quantities

PAY ITEM No.	DESCRIPTION	UNIT	QUANTITY	UNIT COST (US\$)	AMOUNT (US\$)
SECTION 100	FACILITIES FOR THE ENGINEER				
102.4(1a)	Preparation and Implementation of Contractors ESMP, Health and safety plan and Traffic Management Plan	LS	1	10,000.00	10,000.00
102.4(1b)	Preparation and Implementation of GBV Prevention Program including and children protection and sexual exploitation and abuse (SEA)	LS	1	20,000.00	20,000.00
102.5(1)	Preparation and Implementation of STI included HIV/AIDS and COVID-19 Prevention Program	LS	1	10,000.00	10,000.00
SECTION 200	EARTHWORKS				
201(1)	Clearing and Grubbing	Ha.	24.50	3,221.40	78,924.30
201(3)	Individual Removal of Trees, Small (150mm - 900mm dia.)	Each	415.00	130.62	54,207.30
201(4)	Individual Removal of Trees, Large (over 900mm dia.)	Each	30.00	522.48	15,674.40
201(5)	Individual replanting and maintenance (for 1 year) of 10 replacement fruit trees for each Large and Small tree that is cut. Replacement trees to be planted before trees are cut.	Each	5000.00	1.49	7,450.00
PAY ITEM No.	DESCRIPTION	UNIT	QUANTITY	UNIT COST (US\$)	TOTAL COST (US\$)
800	BIO-ENGINEERING WORKS				
801(1)	Nursery Establishment, Operation and Management	L.S.	1.00	216,944.00	216,944.00
801(2)	Grass Slip Production	SQ.M.	77,700.00	0.81	62,937.00
803(1)	Slope Trimming and Preparation	SQ.M.	77,700.00	0.29	22,533.00
805(3)	Planting of Grass Slip (Vetiver Grass)	SQ.M.	77,700.00	0.41	31,857.00
SPL 810	Coco-net Bio-Engineering on Prepared Slopes	SQ.M.	61,500.00	0.12	7,380.00
SPL 811	Planting of Live Stakes on Filled Slopes All plants to be watered and kept alive for 1 year (DNP). Dead plants to be immediately replaced.	SQ.M.	61,500.00	0.26	15,990.00
800	TOTAL - SECTION 800: BIO-ENGINEERING				357,641.00

We are considering additional task based payments for:

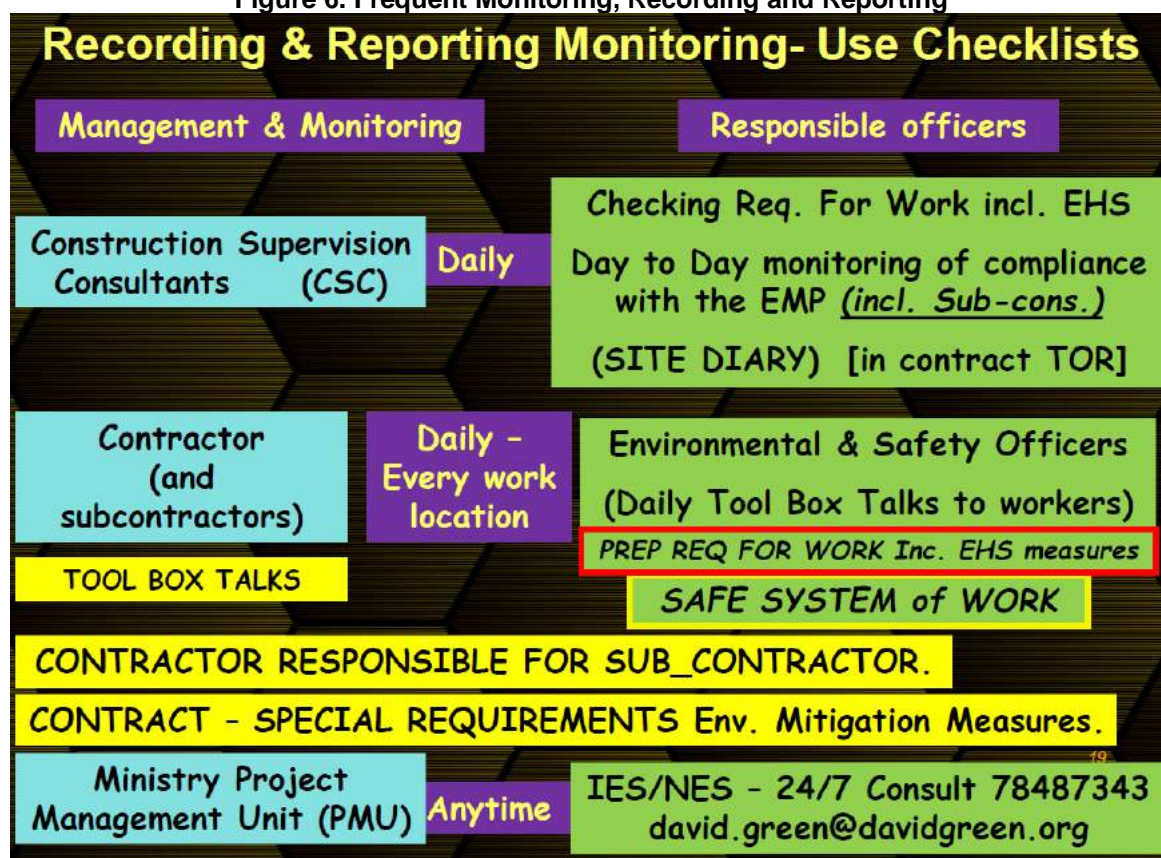
- a) First Aid training, Nurses Sick Bay, Accident Book
- b) Dust Control - water spraying quantified
- c) Waste Disposal
- d) Employment and Skills Training Report (including women)
- e) Community Engagement Management Plan.
- f) Monthly Environmental Monitoring Report / Site Diaries
- g) Communicable Disease Control Planning & Management
- h) Public Consultation meetings and Tara Bandu ceremonies
- i) Timely receipt of Mineral Permit, Environmental Permits (within 3 months)

6 Frequent Training Site Inspections, Monitoring and Reporting

With a strong focus on both office-based and On-The-Job training we repeat our Environmental Compliance and Awareness Training (ECAT) for Supervision Consultants, Contractors and PMU staff twice per year. We included Environmental, Resettlement and Gender specialists (and Management) from the Project Management Unit because there are good opportunities for broader learning and socialization. The ECAT aims to harmonize Environmental, Resettlement and Gender requirements across many projects. In early 2018 we were monitoring 10 projects simultaneously with a staff of six (three Environmental and three Resettlement) with PMU site inspections twice per month. Supervision Consultants and Contractor Officer were inspecting on a daily basis. A systematic approach was essential to manage that workload.

The Contractors Environmental Officer and Consultants Environmental Specialists work together daily and keep site diaries up to date. The Project Management Unit (PMU) visits each project for joint inspections with the Consultants and Contractors targeting at least twice per quarter (or more frequently if required). Consultants instruct the Contractors to improve any ESIA Requirements as necessary. The PMU issue a Corrective and Preventative Action Request (proactive) to follow up Site Instructions accordingly. In practice interaction between the PMU and each project takes place several times per quarter.

Figure 6. Frequent Monitoring, Recording and Reporting



7 Simplify Monitoring by use of Checklists

A series of Environmental Monitoring Checklists (since 2015) contribute to consistency across all projects, and they are used to feed into the monthly environmental monitoring reports. The general checklist is completed on each monitoring occasion to identify the location and type of impacts that are not being controlled sufficiently well. Other checklists are designed to provide guidelines for specific construction activities bringing together all the required mitigation measures for a particular activity identified in the EMMP. The Checklists cover contractor camp, spoil disposal, borrow pits and quarry, manufacturing areas and health and safety. The checklists are completed on site during the joint inspections and are signed-off by the participating Consultant and Contractor officers. This can assist in making timely and effective responses to implementation challenges. Checklists are presented monthly in the standalone monthly environmental monitoring reports (mEMR). Checklists (Figure 7) are appended to the mEMR and instructions for the month are summarized in the mEMR to help improve

implementation of ESIA requirements. We have prepared a glossary of Environmental terms in six languages to help overcome communication challenges.

Figure 7. Checklists for Different Activities

NUMBER	TITLE	FREQUENCY OF COMPLETING
CL 01	GENERAL MONITORING PROGRESS & ACTION	Preferably after every site inspection. At least weekly
CL 02	CONSTRUCTION YARD/CONTRACTOR BASE CAMP / OFFICE	At least weekly
CL 03	SPOIL DISPOSAL – SETUP & CLOSE OUT (includes macadam)	At the time of Setup or Close out
CL 04	SPOIL DISPOSAL OPERATION (Monitoring - includes macadam)	At least weekly
CL 05	BORROW PIT/QUARRY – SETUP & CLOSE OUT	At the time of Setup or Close out
CL 06	BORROW PIT / QUARRY OPERATION	At least weekly
CL 07	MANUFACTURING AREAS (Crusher& Asphalt Mixing Plant AMP, Batching Plant, Casting Yard etc.)	When operating - At least weekly
CL 08	CONTRACTOR WORKER ACCOMODATION	At least weekly
CL 09	HEALTH AND SAFETY	At least weekly

8 Next Steps towards an inclusive Tender, Bid, Contract and Bill of Quantities

In future projects we will add more activity specific payments by interacting closely with the Procurement Authority.

- i. Develop a proactive approach for interaction and network with the Procurement Authority
- ii. Continue to develop inputs to tender and, cooperate with Pre-Bid meetings
- iii. Seek specific penalties for e.g. employing key staff, not obtaining permits timely
- iv. Develop Key Performance indicators
- v. Include additional task based payments
- vi. Repeat training as often as practicable.

If we can continue to incorporate the above approach into the project structure, we hope for greater success with clear definitions of Contractor responsibilities that will drive ESIA Requirements.

9 Conclusions

The Employers Tender documents should have specific requirements for the Contractor to include in their Bid. As more detailed requirements have been presented in the Tender, we think more attention has been paid in the Bids and more success with implementing ESIA Requirements has been possible with much proactive attention to training and enforcement.

10 References

1. International Federation of Consulting Engineers (FIDIC) Construction Contract 2nd Ed (2017 Red Book)
2. The Environmental and Social Impact Assessment (English) for the Timor Leste Branch Roads Projects can be viewed here: <https://projects.worldbank.org/en/projects-operations/document-detail/P155203?type=projects>.
3. The Initial Environmental Assessment for the Baucau Viqueque Highway Project can be viewed here: <https://www.adb.org/projects/documents/tim-51115-001-iee>.
4. Environmental Monitoring Report (July-December 2023) for the Baucau to Viqueque Highway Project can be viewed here: <https://www.adb.org/projects/documents/tim-51115-001-emr-5>
5. The last project bi-annual environmental report for CAREC Road Corridor – 1. (Bishkek – Torugart road) Project 3 Km 479+000 – 539+000 for Ministry of Transportation and Communications, Kyrgyz Republic with assistance from Asian Development Bank prepared by Andrew Taylor is available for viewing on the ADB website here: <https://www.adb.org/projects/documents/kgz-42399-023-emr>

6. The last project bi-annual monitoring report for Alat-Astara Highway, Jalilabad Intersection to Sharul Intersection (km 110+700 to km 80+600) for Azerbaijan Ministry of Transport, Azeryolservis with assistance from Asian Development Bank prepared by Andrew Taylor is available on the ADB website here: https://www.adb.org/sites/default/files/project-documents/45389/45389-004-emr-en_1.pdf
7. The second Environmental and Social Monitoring report for Cyclone Pam School Reconstruction Project. Vanuatu for Ministry of Education and Training with assistance from Asian Development Bank, Japan Fund for Poverty Reduction prepared by Andrew Taylor (Envision-2020) can be viewed here: <https://www.adb.org/projects/documents/van-49320-001-esmr-2>

The Authors

David W J Green is an independent environmental and safeguards specialist consultant with more than 30 years of experience working with financial institutions, government agencies in the public sector and blue chip clients in the private sector. Dr Green has broad international experience of implementing environmental resettlement and social safeguards in more than 25 countries covering a wide range of infrastructure projects, urban planning and environmental management. Dr Green specialises in *Environmental Impact Assessment, Environmental Audit, Environmental Planning and Environmental Management Systems*; with broad brush social and resettlement safeguards experience and extensive experience in capacity building, environmental health and safety management, pollution control, indoor air quality, acoustics and noise control, water pollution biology, bioengineering for slope control, contaminated land, hazardous waste management and asbestos abatement. Dr Green has reported on more than 200 project sites in the past twenty years.

Anderew J Taylor Andrew is a Chartered Civil Engineer who has worked for over 30 years' in environmental engineering projects and environmental safeguards. His early career through the 1980's was in design and supervision of wastewater and solid waste infrastructure in UK and Middle East. In 1990 Andrew moved to Hong Kong leading teams in the development of EIA documentation for road, rail and port infrastructure initially in Hong Kong and later on road infrastructure in New Zealand. Since 2013 he has worked as an independent environmental safeguards consultant for International Financial Institutions (IFI) primarily the Asian Development Bank and World Bank. His early career civil engineering experience has allowed him to bridge between the engineering and environmental disciplines when looking at ways to include implementable environmental mitigation into projects, specifically in contract documentation. With Dr Green the original checklist system was successfully developed and implemented in the field for an ADB project in Kyrgyzstan c 2013 and was subsequently refined during the implementation of projects in Azerbaijan, Timor Leste, Tonga and Vanuatu.