



Review of the Taninthayi Nature Reserve Project as a conservation model in Myanmar

November 2014

E. H. B. Pollard, Soe Win Hlaing and J. D. Pilgrim

The opinions expressed in this report are those of the authors only. They do not necessarily represent the opinions or position of the Forest Department, Wildlife Conservation Society, or any of the TNRP partners.

Citation: Pollard, E. H. B., Soe Win Hlaing & Pilgrim, J. D. (2014) Review of the Taninthayi Nature Reserve Project as a conservation model in Myanmar. Unpublished report of The Biodiversity Consultancy, Cambridge, England.

Cover Photo: Taninthayi Nature Reserve viewed from the MGTC metering station (© TBC/E. Pollard)

Foreword

As the Director General of the Forest Department, my duty is to balance the use of Myanmar's great forest resources with their conservation. One of the best examples of this in the country is the Taninthayi Nature Reserve Project (TNRP). The Forest Department and our private sector partners, with technical support from the Wildlife Conservation Society, have been cooperating for over a decade on this innovative model for conservation and financing protected areas in Myanmar. This independent report highlights lessons learned from the TNRP so that the design of new policies strategic plans can be laid down during this period of rapid economic development.

The TNRP was designed before the concept of biodiversity offsets was as widely accepted as it is today. While the TNRP doesn't meet current expectations of biodiversity offsets, it was groundbreaking for its time and stands out as a world-leading example of voluntary biodiversity compensation. The lessons we have learned from this project can now be used to inform a No Net Loss policy for Myanmar. Such a policy would ensure that development projects follow a mitigation hierarchy, first avoiding impacting forest resources and biodiversity at all; but if unavoidable, ensuring impacts should be clearly understood and minimized. In cases where impacts cannot be completely avoided measures to rehabilitate degraded ecosystems should be taken. It is only once other options are exhausted that the creation of a biodiversity offset to achieve no net loss or a net gain of biodiversity is considered.

Balancing the use of our resources and avoiding the negative impacts often associated with development projects is a relatively simple concept but will entail a huge amount of effort from the Ministry of Environmental Conservation and Forestry and all levels of government, and require the support of civil society. Myanmar faces many challenges to fully capitalize on the opportunities the country now has, including building the capacity and developing the policies and systems to finance the conservation of the natural resources that our people depend on. While we have much to learn from our neighbours and other countries that have experienced similar levels of development we also have great examples from inside Myanmar, where we have already built working models. The TNRP is a proven model that now can be expanded and improved upon for the sustainable development of Myanmar.



Dr. Nyi Nyi Kyaw
Director General
Forest Department
Ministry of Environmental Conservation and Forestry
Nay Pyi Taw

October, 2014

Foreword

The Wildlife Conservation Society Myanmar Program has worked closely with the Forest Department of the Ministry of Environmental Conservation and Forestry for the past decade as technical advisors in the development and implementation of the Taninthayi Nature Reserve Project (TNRP). This innovative program has provided an opportunity for us to expand to new sites activities originally designed with the Forest Department in the Hukaung Valley Wildlife Sanctuary of Kachin State and for the first time in Myanmar to work with partners in the private sector.

The TNRP has been unique in our experience because of the close involvement of the private sector and the leading role of the Forest Department. WCS feels that such a model is worthy of greater attention and consideration, and as such we contracted The Biodiversity Consultancy to independently review and document the TNRP. The project was ahead of its time when designed in the late 1990s, and while many new standards are now being put in place what has already been achieved is worthy of future consideration. During this important time in the development of Myanmar we hope that it can serve as a model for future successful public-private partnerships.

As Myanmar enters this period of rapid development there is a clear need to ensure that the large investments in infrastructure and resource extraction now being planned are implemented in a manner that recognises the value of Myanmar's globally important forests, biodiversity and ecosystem services. Implementation models following that of the TNRP can ensure that key resources are protected and funds are available long into the future for the effective conservation and management of Myanmar's great natural wealth.



A handwritten signature in black ink, which appears to read "U Than Myint". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

U Than Myint
Country Program Director
Wildlife Conservation Society
Myanmar Program

October, 2014

Table of contents

1	Report at a glance.....	6
2	Non-technical summary.....	9
2.1	Compensation model.....	9
2.2	Implementation of the model.....	9
2.3	Legal framework.....	10
2.4	Key strengths and weaknesses of the model and its implementation.....	11
2.4.1	Key strengths.....	11
2.4.2	Key weaknesses.....	11
2.5	Recommendations.....	11
3	Introduction.....	19
3.1	Taninthayi Nature Reserve.....	19
3.1.1	Reserve description.....	19
3.1.2	Reserve management.....	19
3.1.3	Gas pipelines.....	21
4	Overview of the TNRP model.....	23
4.1	Project aims and goals.....	23
4.2	Legal framework.....	23
4.3	Institutional framework.....	25
4.4	Financing.....	25
4.5	Monitoring and reporting.....	26
5	Development and implementation of the TNRP model.....	28
5.1	Project development.....	28
5.1.1	Motivation for involvement.....	29
5.2	Project implementation.....	31
5.2.1	Phase 1.....	31
5.2.2	Phase 2.....	31
5.2.3	Phase 3.....	32
6	Conclusions, comparison to current best-practice and lessons learned.....	33
6.1	Review of the pipeline developments against IFC Performance Standard 6.....	33
6.2	Comparison of the TNRP model with current best-practice on biodiversity offsets.....	37
7	Recommendations.....	43
8	References.....	45
9	Acknowledgements.....	47
10	Appendices.....	48
	Appendix 1: Terms of Reference.....	48
	Appendix 2: List of key interviewees.....	51
	Appendix 3: Itinerary in Myanmar.....	51

1 Report at a glance

This section provides a one page summary review of the Taninthayi Nature Reserve Project (TNRP) for people with little time. This project in southern Myanmar involves payments from companies to support the creation and on-going management of a protected area.

All project partners who were consulted view the project favourably. They believe that ***the project is contributing to the conservation of Myanmar's biodiversity, and this has been done at no operational, and only minor financial, burden*** to the companies involved. The initiative has helped companies to ***successfully manage some non-technical risks*** associated with operating in a sensitive environment with globally-important biodiversity. The TNRP ***compensates for some impacts on biodiversity*** caused by the pipelines and support facilities, which has helped to address stakeholder concerns. In addition, protection of the forest area around the pipeline has reportedly ***reduced the risk of erosion damage to pipelines*** and might have ***contributed to improved security*** along the pipeline.

The project started in 2005 and is proposed to continue for the lifetime of the pipelines (at least until 2028). Payments come from three gas pipeline companies as compensation for impacts on biodiversity along the pipeline route. Project partners (three pipeline companies and the Myanmar Forest Department [FD]) agree four-year work plans and budgets. The budget was \$1.2 million for each of the first two phases (2005-2012), and \$1.8 million for the third phase (2013-2016). The model is a ***simple compensation system***, with flat payments made to the FD to implement conservation activities as they see fit. The model was ***not developed as biodiversity offset***.

This review revealed that ***the project has broadly met its stated goals and objectives***:

- The companies have met their financial commitments.
- Stakeholder criticism of pipeline biodiversity impacts has been limited.
- A protected area has been established and managed since 2005, with socio-economic development programmes delivered to surrounding communities.
- The capacity of FD staff involved in the TNRP has been improved.

Project success has influenced key government decision makers and provided an environment for the development of a more effective national model.

Current best-practice in compensating for industry impacts on biodiversity centres on use of the mitigation hierarchy, including biodiversity offsetting. We reviewed the TNRP against International Finance Corporation Performance Standard 6 (IFC PS6), the Business and Biodiversity Offsets Program standard (BBOP 2012) and other key guidance. The pipelines and TNRP were not originally developed to be in alignment with these standards and the TNRP is not an offset. The TNRP thus does not meet current mitigation or offsetting best-practice in many areas. Our review does, however, highlight key lessons learned for the TNRP – particularly if it is adapted as a model for wider use in Myanmar:

- Impact assessments should thoroughly analyse direct and indirect impacts on biodiversity.
- The mitigation hierarchy should be followed during the construction and operation of infrastructure.
- In order to identify how much compensation is enough, it is necessary to quantify biodiversity losses from development impacts and gains from conservation activities.
- Monitoring of actions on the ground is the only way to determine their success in mitigating residual impacts and reducing background rates of loss in biodiversity.

၁။ အစီရင်ခံစာ အကျဉ်းချုပ်

ဤအကျဉ်းချုပ်တွင် တနင်္သာရီ သဘာဝကြီးပိုင်း စီမံကိန်းလုပ်ငန်းများ အကောင်အထည်ဖော်ဆောင်ရွက်နေမှုအပေါ် သုံးသပ်ချက်များကို အချိန်တိုအတွင်း စာဖတ်သူများသိရှိသဘောပေါက်နိုင်စေရန် ရေးသားဖော်ပြထားပါသည်။ မြန်မာနိုင်ငံတောင်ပိုင်းတွင် အကောင်အထည်ဖော်ဆောင်ရွက်နေသည့် ယင်းစီမံကိန်းတွင် သဘာဝဓါတ်ငွေ့ထုတ်လုပ်ရေးကုမ္ပဏီများမှ ထည့်ဝင်သည့်ရံပုံငွေများဖြင့် သဘာဝထိန်းသိမ်းရေးနယ်မြေ ဖွဲ့စည်းတည်ထောင်ခြင်းနှင့် စီမံအုပ်ချုပ်ခြင်း လုပ်ငန်းများ ဆောင်ရွက်လျက်ရှိပါသည်။

စီမံကိန်းတွင် ပါဝင်ဆောင်ရွက်နေသူအားလုံးအနေဖြင့် တနင်္သာရီသဘာဝကြီးပိုင်းစီမံကိန်းအပေါ် ထောက်ခံကြပါသည်။ ယင်းတို့အနေဖြင့် အဆိုပါစီမံကိန်းသည် မြန်မာ့ဇီဝမျိုးစုံမျိုးကွဲ ထိန်းသိမ်းမှုအတိုင်းအတာတစ်ခုအထိ အထောက်အကူပြုလျက်ရှိပြီး ကုမ္ပဏီများအတွက် ငွေကြေး ကုန်ကျမှုအနည်းငယ်သာရှိ၍ အခြားလုပ်ငန်းပိုင်းဆိုင်ရာ ဝန်ထုပ်ဝန်ပိုးမရှိဟု ယုံကြည်ကြပါသည်။ ဤလုပ်ငန်းအစပြုမှုက တစ်ကမ္ဘာလုံးဆိုင်ရာ မျိုးသုဉ်းရန် ခြိမ်းခြောက်မှုအဆင့်သို့ ရောက်နေသော ဇီဝမျိုးစုံမျိုးကွဲများနှင့် ထိရှပျက်စီးလွယ်သော သဘာဝပတ်ဝန်းကျင်တွင် လုပ်ငန်းဆောင်ရွက်နေကြသော ကုမ္ပဏီများအတွက် နည်းပညာနှင့် ဆက်စပ်မှုနည်းသည့် အန္တရာယ်များကို ကောင်းမွန်စွာ စီမံအုပ်ချုပ်စေနိုင်ခဲ့ပါသည်။ တနင်္သာရီ သဘာဝကြီးပိုင်းစီမံကိန်းသည် ဓါတ်ငွေ့ပိုက်လိုင်းနှင့် ဆက်စပ် အဆောက်အဦများကြောင့် ဖြစ်ပေါ်သော ဇီဝမျိုးစုံမျိုးကွဲများအပေါ် ထိခိုက်မှုအချို့ကို ပေးလျှော်ခြင်းဖြင့် ဆက်စပ်ပါဝင်သူများ၏ စိုးရိမ်မှုများကို လျော့နည်းစေပါသည်။ ထို့အပြင် ဓါတ်ငွေ့ပိုက်လိုင်း တစ်လျှောက်ရှိ သစ်တောများကို ထိန်းသိမ်းကာကွယ်ခြင်းဖြင့် မြေဆီလွှာတိုက်စားခြင်းကို သိသာစွာ ကာကွယ်ပေးပြီး ပိုက်လိုင်းတစ်လျှောက် လုံခြုံရေးကိုလည်း ပိုမိုတိုးတက်ကောင်းမွန်လာစေပါသည်။

ဤစီမံကိန်းကို ၂၀၁၅ ခုနှစ်တွင် စတင်ခဲ့ပြီး ပိုက်လိုင်းစာချုပ်သက်တမ်းပြီးဆုံးချိန်အထိ (အနည်းဆုံး ၂၀၂၅ခုနှစ်) ဆက်လက်ဆောင်ရွက်သွားရန် အဆိုပြုထားပါသည်။ ပိုက်လိုင်းလမ်းကြောင်းတစ်လျှောက် ဇီဝမျိုးစုံမျိုးကွဲများအပေါ် အကျိုးသက်ရောက်မှုအတွက် လျော်ကြေးအဖြစ် သဘာဝဓါတ်ငွေ့ထုတ်လုပ်သည့် ကုမ္ပဏီ(၃)ခုမှ လျော်ကြေးငွေပေးဆောင်ထားပါသည်။ စီမံကိန်းကို လက်တွဲအကောင်အထည်ဖော်နေသည့် ပိုက်လိုင်းကုမ္ပဏီ (၃) ခုနှင့် သစ်တောဦးစီးဌာနတို့သည် (၄)နှစ်လျှင် တစ်ကြိမ် လုပ်ငန်းစီမံချက်နှင့် ဘတ်ဂျက်များ ရေးဆွဲပြီး အကောင်အထည်ဖော်ကြပါသည်။ စီမံကိန်းပထမအဆင့်လေးနှစ်နှင့် ဒုတိယအဆင့်လေးနှစ်များ (၂၀၁၅-၂၀၁၂)အတွက် အမေရိကန်ဒေါ်လာ(၁.၂) သန်းစီသုံးစွဲခဲ့ပြီး တတိယအဆင့်လေးနှစ် (၂၀၁၃-၂၀၁၆) အတွက် (၁.၃)သန်း သုံးစွဲရန်လျာထားပါသည်။ ဤစီမံကိန်းသည် သစ်တောဦးစီးဌာနက သင့်တော်သည့် ထိန်းသိမ်းရေးလုပ်ငန်းများကို အကောင်အထည်ဖော်ဆောင်ရွက်နိုင်ရန် ရိုးရှင်းသည့် လျော်ကြေးငွေပေးဆောင်သော စနစ်တစ်ခုဖြစ်ပြီး ဇီဝမျိုးစုံမျိုးကွဲများ ပျက်စီးဆုံးရှုံးမှုကို ပြန်လည်အစားထိုး တည်ထောင်ခြင်းလုပ်ငန်း (Biodiversity Offset) မဟုတ်ပါ။

ယခုပြန်လည်သုံးသပ်ချက်အရ တနင်္သာရီ သဘာဝကြီးပိုင်းစီမံကိန်းသည် မူလရည်ရွယ်ထားရှိသည့် ပန်းတိုင်နှင့် ရည်ရွယ်ချက်များကို အကောင်အထည်ဖော်နိုင်ကြောင်း တွေ့ရှိရပါသည်။

- ကုမ္ပဏီများသည် ၎င်းတို့၏ ငွေကြေးဆိုင်ရာ ကတိပြုထားမှုများကို လိုက်နာမှုရှိပါသည်။

- ပိုက်လိုင်းဖောက်လုပ်မှုများကြောင့် ဇီဝမျိုးစုံမျိုးကွဲအား ဆိုးကျိုးသက်ရောက်မှုများအပေါ် ဆက်စပ်ပါဝင်သူများ၏ ဝေဖန်အကဲဖြတ်ချက်များကို ကန့်သတ်နိုင်ခဲ့ပါသည်။
- ၂၀၀၅ ခုနှစ်မှစ၍ သဘာဝထိန်းသိမ်းရေးနယ်မြေကို ဖွဲ့စည်းတည်ထောင်အုပ်ချုပ်ခဲ့ပြီး တစ်ဖက်တွင်လည်း အနီးပတ်ဝန်းကျင်ရှိဒေသခံပြည်သူလူထု၏ လူမှုစီးပွားဖွံ့ဖြိုးတိုးတက်ရေးလုပ်ငန်းများကိုလည်း ဆောင်ရွက်ပေးလျက်ရှိပါသည်။
- တနင်္သာရီသဘာဝကြိုးဝိုင်းစီမံကိန်းတွင် တာဝန်ထမ်းဆောင်နေသည့် သစ်တောဦးစီးဌာန ဝန်ထမ်းများ၏ စွမ်းဆောင်ရည်များလည်း တိုးတက်လာခဲ့ပါသည်။

စီမံကိန်းအောင်မြင်မှုများသည် နိုင်ငံတော်အစိုးရ၏ ဆုံးဖြတ်ချက်ချသူများအပေါ် လွှမ်းမိုးမှုရှိခဲ့ပြီး ယခုစီမံကိန်းသည် ဖွံ့ဖြိုးတိုးတက်ရေးအတွက် သဘာဝပတ်ဝန်းကျင်အရေးပါမှုကို အမျိုးသားအဆင့် စံနမူနာကောင်းတစ်ခုအဖြစ် ရပ်တည်လာနိုင်မည့် အနေအထားတွင် တည်ရှိနေပါသည်။

စက်မှုလုပ်ငန်းများကြောင့် ဇီဝမျိုးစုံမျိုးကွဲအပေါ် ဆိုးကျိုးသက်ရောက်မှုများအတွက် ပေးလျော်ခြင်းများတွင် ဇီဝမျိုးစုံမျိုးကွဲများ ပြန်လည်အစားထိုးတည်ထောင်ခြင်း အပါအဝင် ပျက်စီးဆုံးရှုံးမှုကို လျှော့ပါးသက်သာစေသော အစီအမံများပါဝင်ပါသည်။ တနင်္သာရီသဘာဝ ကြိုးဝိုင်းစီမံကိန်းကို International Finance Corporation Performance Standard 6 (IFC PS6) and Business and Biodiversity Offsets Program Standard (BBOP 2012) နှင့်အခြားအဓိက အရေးပါသော လမ်းညွှန်ချက်များနှင့် နှိုင်းယှဉ်သုံးသပ်ထားပါသည်။

ဓာတ်ငွေ့ပိုက်လိုင်းဖောက်လုပ်ခြင်းနှင့်တနင်္သာရီသဘာဝကြိုးဝိုင်းစီမံကိန်းလုပ်ငန်းများသည် ဖော်ပြပါ စံညွှန်းများနှင့်အညီ အကောင်အထည်ဖော်ရန် ရည်ရွယ်ခဲ့ခြင်းမရှိသလို ဇီဝမျိုးစုံမျိုးကွဲများ ပျက်စီးဆုံးရှုံးမှုကို ပြန်လည်အစားထိုးတည်ထောင်ခြင်းလည်း မဟုတ်ပါ။ ထို့ကြောင့် တနင်္သာရီသဘာဝကြိုးဝိုင်း စီမံကိန်းသည် လက်ရှိကျင့်သုံးနေသည့် အကောင်းဆုံး ဇီဝမျိုးစုံမျိုးကွဲများ အန္တရာယ်ကျရောက်မှုလျှော့ချခြင်းသို့မဟုတ် အစားထိုးတည်ထောင်ခြင်း ဆောင်ရွက်ရမည့် လုပ်ဆောင်ချက်များနှင့် ကွဲပြားမှုများရှိနေပါသည်။ သို့သော် ဤစီမံကိန်းအား မြန်မာပြည်တွင် ပိုမိုကျယ်ပြန့်စွာအသုံးပြုနိုင်ရန်အတွက် စံနမူနာတစ်ခုအဖြစ် မှီငြမ်းပြောဆိုရန် တနင်္သာရီသဘာဝကြိုးဝိုင်းစီမံကိန်းမှ ရရှိသော အဓိကအချက်အလက်များနှင့် သင်ခန်းစာများကို ဤပြန်လည်သုံးသပ်ချက်တွင် အလေးပေးဖော်ပြထားပါသည်။

- ဇီဝမျိုးစုံမျိုးကွဲများအပေါ် တိုက်ရိုက်သို့မဟုတ်သွယ်ဝိုက်ခြင်းဖြင့် အကျိုးသက်ရောက်မှုများကို အသေးစိတ် လေ့လာသင့်ပါသည်။
- ဇီဝမျိုးစုံမျိုးကွဲများအပေါ် အန္တရာယ်ကျရောက်မှုလျှော့ချခြင်း လုပ်ငန်းစဉ်များကို ဆောက်လုပ်ရေးလုပ်ငန်းများနှင့် အခြေခံအဆောက်အအုံလုပ်ငန်းများ စတင်ချိန်တွင် တပြိုင်နက်တည်း လုပ်ဆောင်သင့်ပါသည်။
- လုံလောက်သော လျော်ကြေးငွေလိုအပ်မှုပမာဏကို သိရှိနိုင်ရန် ဇီဝမျိုးစုံမျိုးကွဲများ ဆုံးရှုံးမှုပမာဏနှင့် ထိန်းသိမ်းရေးလုပ်ငန်းရလဒ်များကို တန်ဖိုးသင့်တိုင်းတာတွက်ချက်ရန် လိုအပ်ပါသည်။

- ဇီဝမျိုးစုံမျိုးကွဲများဆုံးရှုံးမှု အခြေခံနှုန်းနှင့် ကြွင်းကျန်သော အကျိုးသက်ရောက်မှုများကို အောင်မြင်စွာလျော့ချနိုင်ရန် တစ်ခုတည်းသောနည်းလမ်းမှာ လုပ်ငန်းအကောင်အထည်ဖော်မှုများကို မြေပြင်တွင် စောင့်ကြည့်စစ်ဆေးခြင်း ဖြစ်ပါသည်။

2 Non-technical summary

This section summarises a review of the Taninthayi Nature Reserve Project (TNRP) in southern Myanmar. It is a brief summary, but contains all key conclusions and recommendations in order to inform decision-makers with little time to read the rest of the report.

The project involves payments from private companies to support the creation and on-going management of a protected area. ***This public-private partnership is unique in Myanmar and could form the basis of a model which can be applied to other developments in the country.*** This review documents the main elements of the model, assesses how it was developed and implemented, and highlights some key lessons which can be learned.

All project partners who were consulted view the project favourably. They believe that ***the project is contributing to the conservation of Myanmar's biodiversity, and this has been done at no operational, and only minor financial, burden*** to the companies involved. The initiative has helped companies to ***successfully manage some non-technical risks*** associated with operating in a sensitive environment with globally-important biodiversity. The TNRP ***compensates for some impacts on biodiversity*** caused by the pipelines and support facilities, which has helped to address stakeholder concerns. In addition, protection of the forest area around the pipeline has reportedly ***reduced the risk of erosion damage to pipelines*** and might have ***contributed to improved security*** along the pipeline.

2.1 Compensation model

- ***The model is one of simple compensation.*** Three pipeline companies pay the Forest Department (FD) for protected area management.
- ***The project was not developed as, nor ever presented as, a biodiversity offset.*** There was no quantification of the impacts of the pipelines or the potential gains possible from the TNR. The TNRP does not aim to achieve No Net Loss or a Net Gain.
- The model was first proposed during construction of the Total-operated Motamma Gas Transportation Company (MGTC) pipeline in 1996-1997 in order to compensate for some pipeline impacts on biodiversity.
- ***There is no direct link between the type and scale of impacts of the pipeline development on biodiversity and the conservation activities carried out by the TNRP.***
- Understandably, the TNRP does not meet current mitigation or offsetting best-practice (e.g., International Finance Corporation Performance Standard 6 and the Business and Biodiversity Offsets Program Standard) in many areas, since it was developed prior to such guidance becoming available.

2.2 Implementation of the model

- The model is being implemented in funding phases: Phase 1 (2005-9) and Phase 2 (2009-13).
- The project partners agree a 4-year work plan and budget. This was \$1.2 million for each of Phases 1 and 2, which involved MGTC and Taninthayi Pipeline Company (TPC). PTTEP is

building a third pipeline and has joined the project for Phase 3 (PTTEP is also a junior partner in the other two companies and is the main customer for the gas exported Thailand). The Myanmar state company Myanma Oil and Gas Enterprise is a junior in all three companies and buys a small proportion of the gas.

- TNRP Phase 3 has been designed, with a budget of \$1.8 million over four years.
- Project oversight is by a Project Coordinating Committee (PCC), a high level body consisting of the Director General of the FD and senior company staff.
- A Technical Coordinating Committee was set up in Phase 2. This meets quarterly, and consists of senior TNRP staff, company HSE staff and others. This committee manages the on-going implementation of project activities.
- ***The FD has full responsibility to implement the four-year work plans with little or no influence by the project partners.***
- ***Project activities try to address the principal threats of poaching, illegal logging and encroachment.*** There is a strong emphasis on rural development as a conservation strategy, and also as a goal of the project in and of itself. There is a limited biodiversity monitoring programme, and a small law enforcement patrolling programme.
- ***The major impediment to conservation activities is the security situation.*** Karen National Union control some areas and greatly limit access to significant portions of the TNR. In recent years, however, relations have begun to improve and there is hope that more of the reserve will be accessible during Phase 3.
- Reporting is mainly against implementation targets (activities and expenditure) rather than conservation targets. At the end of each Phase, full project evaluations have indicated that implementation has broadly followed the plans.
- The Wildlife Conservation Society (WCS) Myanmar Program has had close involvement in the development of the Phase 2 and Phase 3 plans. WCS provides technical support to the project, including on wildlife survey techniques, patrolling methods, threats analysis and management planning.
- ***There is an excellent relationship between the project partners at a site and national level.*** There appears to be good coordination between the partners, through bi-monthly site-level meetings. There are no reported clashes between company social development programmes and the TNRP.

2.3 Legal framework

- ***The model is a voluntary contract between the companies and the FD.*** It was developed independent of any clear legal framework.
- A new national Environmental Impact Assessment (EIA) legislation will be issued in 2014. An opportunity may exist at a later stage to include stronger coverage of biodiversity issues, including requirements regarding application of the mitigation hierarchy as part of EIA requirements.
- ***The 'Environmental Management Fund' referred to in the Environmental Conservation Law could provide the basis for the funding of offsets,*** compensation or other payment for environmental services (PES) programmes.

2.4 Key strengths and weaknesses of the model and its implementation

2.4.1 Key strengths

- Private sector financing led to the creation and long-term management of a protected area in an area of global biodiversity importance.
- The FD has been able to implement conservation activities as they see fit, with little influence by the participating companies.
- The project has broadly succeeded in implementing its planned conservation interventions.
- There is excellent coordination and collaboration between project partners from private sector, government and civil society.
- All main partners view the project very favourably.

2.4.2 Key weaknesses

- There has been no explicit effort by the companies to follow the mitigation hierarchy during construction or operation.
- There is no link between the scale of compensation and the magnitude of the impacts. No attempt has been made to quantify the scale of the impacts or conservation gains that have happened or could be achieved. It is therefore not possible to say if the project has actually compensated for pipeline impacts.
- Project performance is measured only by implementation of activities (response). There are no targets for pressure (threats) or state (status of priority biodiversity features).
- Financing has been relatively modest in comparison to normal protected area cost needs. Security constraints mean, however, that the effective size of the PA is smaller than the legally defined area, so current resources may be sufficient.
- Financing is only secure on 4-year cycles, with just a non-binding commitment that funding will continue as long as the pipelines are in operation.

2.5 Recommendations

The following recommendations are made for the development and application of a model that links development impacts with conservation benefits in Myanmar. These are based on the results of this review, current recommendations on best-practice, and TBC's experience:

- The MOECF is recommended to update the EIA guidelines to mandate that all new developments:
 - Use the mitigation hierarchy (avoid, minimise, restore, and then offset) to address their impacts on biodiversity. Guidance for developers, and enhanced monitoring capacity within MOECF, will be necessary for this requirement to be realistic.
 - Assess both indirect and cumulative impacts on biodiversity.
 - Quantify impacts on biodiversity. This will at minimum require the identification of priority biodiversity features, clear metrics for quantifying (direct and indirect) impacts, and development of robust methods to measure biodiversity.
 - Link the scale of developer compensation to the magnitude of residual impacts, through clarification of Government biodiversity goals such as 'No Net Loss' or 'Net Gain'.
 - Develop and implement of biodiversity action plans, or similar, to guide implementation of mitigation measures and biodiversity offsets.
 - Include a robust monitoring programme.

- The FD is recommended to develop mechanisms to guarantee the long-term (at least as long as predicted impacts) financing of compensation/offset projects. Examples are conservation trust funds, insurance or bonds. The Environmental Management Fund mentioned in the 2012 Environmental Conservation Law may provide a basis for an overarching trust fund, but will need to ensure a sufficient level of transparency and financial independence.
- Companies in Myanmar are recommended to learn from the pioneering efforts of the TNRP in order to develop compensation programmes which are even better aligned with current best practice, such as International Finance Corporation Performance Standard 6 and the Business and Biodiversity Offset Programme Standard.

၂။ နည်းပညာ မဆန်သော ပြန်လည်သုံးသပ်ချက်အကျဉ်း

ဤကဏ္ဍတွင် မြန်မာနိုင်ငံတောင်ပိုင်းတွင်ဆောင်ရွက်နေသည့် တနင်္သာရီသဘာဝကြိုးဝိုင်းစီမံကိန်းအပေါ် ပြန်လည်သုံးသပ်ချက်ကို အကျဉ်းချုပ်ဖော်ပြထားပါသည်။ အတိုချုပ်ဖော်ပြထားသော်လည်းအစီရင်ခံစာတွင် ပါရှိသောအချက်များကို ဆုံးဖြတ်ချက်ချသူများအနေဖြင့် အချိန်တိုအတွင်းဖတ်ရှုသိရှိနိုင်ရန် အဓိကကျသည့် ကောက်ချက်များနှင့် အကြံပြုချက်များပါဝင်ပါသည်။

ဤစီမံကိန်းသည် သဘာဝနယ်မြေတည်ထောင်ခြင်းနှင့် စီမံအုပ်ချုပ်ခြင်းလုပ်ငန်းများဆောင်ရွက်ရန် သဘာဝဓာတ်ငွေ ပုဂ္ဂလိက ကုမ္ပဏီများမှ ငွေကြေးပံ့ပိုးပေးထားခြင်းဖြစ်ပါသည်။ မြန်မာနိုင်ငံတွင် ဤကဲ့သို့ အစိုးရနှင့် ပုဂ္ဂလိကကုမ္ပဏီများပူးပေါင်းဆောင်ရွက်မှုသည် ထူးခြားမှုတစ်ခုဖြစ်ပြီး နိုင်ငံတွင်းအခြားသော ဖွံ့ဖြိုးရေးလုပ်ငန်းများတွင်လည်း အလားတူဆောင်ရွက်နိုင်ရန် စံနမူနာတစ်ခုလည်း ဖြစ်လာနိုင်ပါသည်။ ဤသုံးသပ်ချက်များတွင် စံနမူနာစီမံကိန်း၏ အဓိကအချက်များ၊ ပြုစုခြင်းနှင့် အကောင်အထည် ဖော်ဆောင်ခြင်းများကို အကဲဖြတ်ခြင်းနှင့် လေ့လာရမည့် သင်ခန်းစာများကို ဦးစားပေးတင်ပြထားသည်။

စီမံကိန်းတွင်ပါဝင်ဆောင်ရွက်နေသူအားလုံးအနေဖြင့် တနင်္သာရီသဘာဝကြိုးဝိုင်းစီမံကိန်းအပေါ် ထောက်ခံ ကြပါသည်။ ယင်းတို့အနေဖြင့် အဆိုပါစီမံကိန်းသည် မြန်မာ့ဇီဝမျိုးစုံမျိုးကွဲ ထိန်းသိမ်း စောင့်ရှောက်ရေးကို အတိုင်းအတာတစ်ခုအထိ အထောက်အကူပြုလျက်ရှိပြီး ကုမ္ပဏီများအတွက် ငွေကြေး ကုန်ကျမှု အနည်းငယ်သာရှိ၍ အခြားလုပ်ငန်းပိုင်းဆိုင်ရာ ဝန်ထုပ်ဝန်ပိုးမရှိဟု ယုံကြည်ကြပါသည်။ ဤလုပ်ငန်း အစပြုမှုက တစ်ကမ္ဘာလုံးဆိုင်ရာ မျိုးသုဉ်းရန် ခြိမ်းခြောက်မှုအဆင့်သို့ ရောက်နေသော ဇီဝမျိုးစုံမျိုးကွဲများနှင့် ထိရောက်စွာလွယ်သော သဘာဝပတ်ဝန်းကျင်တွင် လုပ်ငန်းဆောင်ရွက်နေကြသော ကုမ္ပဏီများအတွက် နည်းပညာနှင့် ဆက်စပ်မှုနည်းသည့် အန္တရာယ်များကို ကောင်းမွန်စွာ စီမံအုပ်ချုပ်စေနိုင်ခဲ့ပါသည်။ တနင်္သာရီ သဘာဝကြိုးဝိုင်းစီမံကိန်းသည် ဓါတ်ငွေ့ပိုက်လိုင်းနှင့် ဆက်စပ် အဆောက်အဦများကြောင့် ဖြစ်ပေါ်သော ဇီဝမျိုးစုံမျိုးကွဲများအပေါ် ထိခိုက်မှုအချို့ကို ပေးလျှော်ခြင်းဖြင့် ဆက်စပ်ပါဝင်သူများ၏ စိုးရိမ်မှုများကို လျော့နည်းစေပါသည်။ ထို့အပြင် ဓါတ်ငွေ့ပိုက်လိုင်း တစ်လျှောက်ရှိ သစ်တောများကို ထိန်းသိမ်းကာကွယ်ခြင်းဖြင့် မြေဆီလွှာတိုက်စားခြင်းကို သိသာစွာ ကာကွယ်ပေးပြီး ပိုက်လိုင်း တစ်လျှောက် လုံခြုံရေးကိုလည်း ပိုမိုတိုးတက်ကောင်းမွန်လာစေပါသည်။

၂.၁. လျော်ကြေးငွေ ပေးဆောင်မှု စံနမူနာ

- ထိန်းသိမ်းရေးလုပ်ငန်းများဆောင်ရွက်ရန် ရိုးရှင်းသော လျော်ကြေးငွေပေးဆောင်သည့် နမူနာပုံစံ တစ်ခုဖြစ်သည်။ ပိုက်လိုင်းကုမ္ပဏီ(၃)ခုမှ ထိန်းသိမ်းရေးနယ်မြေ တည်ထောင်စီမံအုပ်ချုပ်မှု လုပ်ငန်း အတွက် သစ်တောဦးစီးဌာနအား ရံပုံငွေ ထောက်ပံ့ပါသည်။
- ဤစီမံကိန်းကို ဇီဝမျိုးစုံမျိုးကွဲများပျက်စီးဆုံးရှုံးမှုကို ပြန်လည်တည်ထောင်အစားထိုးခြင်းလုပ်ငန်း (Biodiversity Offset) အဖြစ် မည်သည့်အခါကမှ ပြုစုခြင်းနှင့်တင်ပြခြင်း မရှိခဲ့ပါ။ ဓာတ်ငွေ့ ပိုက်လိုင်းကြောင့် ဇီဝမျိုးစုံမျိုးကွဲများ ပျက်စီးဆုံးရှုံးမှုပမာဏ သို့မဟုတ် တနင်္သာရီသဘာဝကြီးပိုင်းမှ ရရှိသော အကျိုးအမြတ် ပမာဏများကို တန်းဘိုးသင့် တွက်ချက်ခဲ့ခြင်းမရှိပါ။ တနင်္သာရီ သဘာဝကြီးပိုင်းစီမံကိန်းသည် အသားတင် ဆုံးရှုံးမှု သို့မဟုတ် အသားတင်အမြတ်ရမှုများ လုံးဝမရှိရန် ရည်ရွယ်ဆောင်ရွက်ခဲ့ခြင်းမဟုတ်ပါ။
- ဤစီမံကိန်းကို Total ကုမ္ပဏီမှတာဝန်ယူလုပ်ကိုင်သည့် မုတ္တမ သဘာဝဓါတ်ငွေ့ သယ်ယူ ပို့ဆောင်ရေး ကုမ္ပဏီ (MGTC) က ပိုက်လိုင်းများဆောက်လုပ်နေသည့် ကာလဖြစ်သော ၁၉၉၆-၁၉၉၇ ခုနှစ် အတောအတွင်း ဓာတ်ငွေ့ပိုက်လိုင်း ဖောက်လုပ်မှုကြောင့် ဇီဝမျိုးစုံမျိုးကွဲများ ပျက်စီး ဆုံးရှုံးမှုအချို့အတွက် လျော်ကြေးပေးဆောင်ရန် ပထမဦးဆုံးအဆိုတင်သွင်းခဲ့ပါသည်။
- ပိုက်လိုင်းများ ဖောက်လုပ်တည်ဆောက်ခြင်းကြောင့် ဇီဝမျိုးစုံမျိုးကွဲများအပေါ် ဆိုးကျိုးသက်ရောက် မှုအမျိုးအစား၊ ပမာဏနှင့် တနင်္သာရီသဘာဝကြီးပိုင်းစီမံကိန်းမှ ဆောင်ရွက်နေသော ထိန်းသိမ်း ရေးလုပ်ငန်းများ အကြားတွင် တိုက်ရိုက်ဆက်နွှယ်မှုမရှိပါ။
- တနင်္သာရီသဘာဝကြီးပိုင်းစီမံကိန်းသည် လက်ရှိကျင့်သုံးနေသည့် ဇီဝမျိုးစုံမျိုးကွဲများ အန္တရာယ် ကျရောက်မှု လျော့ချခြင်းနှင့် ပြန်လည်တည်ထောင်ခြင်းများအတွက် အကောင်းဆုံးလုပ်ငန်းစဉ် များ (ဥပမာ -International Finance Corporation Performance Standard 6 and the Business and Biodiversity Offsets Program Standard)နှင့် တူညီမှုမရှိနိုင်ပေ။ အဘယ်ကြောင့်ဆိုသော်ဤစီမံကိန်းသည် အဆိုပါ လမ်းညွှန်ချက်များ ပြုစုအသုံးပြုမှုမရှိခင် ကတည်းက အကောင်အထည်ဖော်ခဲ့သောကြောင့်ဖြစ်ပါသည်။

၂.၂. ထိန်းသိမ်းရေးစံနမူနာကို အကောင်အထည်ဖော်ဆောင်ခြင်း

- ထိန်းသိမ်းရေးစံနမူနာကို ရံပုံငွေဖွံ့ဖြိုးမှုအဆင့်များဖြစ်သည့် စီမံကိန်း ပထမအဆင့် (၂၀၀၅-၂၀၀၉) နှင့် စီမံကိန်း ဒုတိယအဆင့် (၂၀၀၉-၂၀၁၃) များတွင်အကောင်အထည်ဖော်ခဲ့ပါသည်။
- စီမံကိန်း မိတ်ဖက်များအားလုံးက (၄) နှစ်ကာလ လုပ်ငန်းစီမံချက်များနှင့် ရသုံးမှန်းချေ ဘဏ္ဍာငွေ တွက်ချက်မှုများကို သဘောတူကြပါသည်။ စီမံကိန်း ပထမအဆင့် နှင့် ဒုတိယအဆင့် များတွင် မုတ္တမ သဘာဝဓာတ်ငွေ့ သယ်ယူပို့ဆောင်ရေးကုမ္ပဏီ (MGTC)နှင့် တနင်္သာရီ ပိုက်လိုင်း ကုမ္ပဏီ

(TPC) များက အဆင့်တစ်ခုစီအတွက် စုစုပေါင်း အမေရိကန်ဒေါ်လာ (၁.၂)သန်း ထည့်ဝင်ခဲ့ကြပါသည်။ PTTEP သဘာဝဓာတ်ငွေ့ ရှာဖွေရေးနှင့် ထုတ်လုပ်ရေးကုမ္ပဏီ သည် တတိယမြောက် သဘာဝဓာတ်ငွေ့ ပိုက်လိုင်းကို တည်ဆောက်နေဆဲဖြစ်ပြီး စီမံကိန်း တတိယအဆင့်တွင် ပူးပေါင်းပါဝင်မည်ဖြစ်သည်။ (PTTEP ကုမ္ပဏီသည် ထပ်မံဝင်ရောက်လာသည့် စီမံကိန်း မိတ်ဖက်အသစ် ဖြစ်ပြီး ထိုင်းနိုင်ငံသို့တင်ပို့သော သဘာဝဓာတ်ငွေ့ကို အဓိကဝယ်ယူသော ကုမ္ပဏီဖြစ်ပါသည်။) မြန်မာနိုင်ငံအစိုးရလုပ်ငန်းဖြစ်သော မြန်မာ့ရေနံနှင့် သဘာဝဓာတ်ငွေ့လုပ်ငန်း (MOGE)သည် ကုမ္ပဏီအားလုံးနှင့် နှိုင်းယှဉ်လျှင် အရွယ်အစား သေးငယ်ပြီး သဘာဝဓာတ်ငွေ့ ပမာဏ အနည်းငယ်သာ ဝယ်ယူပါသည်။

- တနင်္သာရီသဘာဝကြိုးပိုင်းစီမံကိန်း တတိယအဆင့် (၄)နှစ်တာကာလအတွက် ရံပုံငွေ အမေရိကန်ဒေါ်လာ (၁.၈)သန်းကို ရေးဆွဲသတ်မှတ်ထားပြီးဖြစ်ပါသည်။
- စီမံကိန်းအား သစ်တောဦးစီးဌာနမှ ညွှန်ကြားရေးမှူးချုပ်နှင့် ကုမ္ပဏီများမှ အဆင့်မြင့် ဝန်ထမ်းများ ပါဝင်သော စီမံကိန်းညှိနှိုင်းရေးကော်မတီ (Project Coordinating Committee) ကကြီးကြပ်ပါသည်။
- နည်းပညာညှိနှိုင်းရေးကော်မတီ (Technical Coordinating Committee)ကို စီမံကိန်း ဒုတိယအဆင့်တွင် ဖွဲ့စည်းခဲ့သည်။ ယင်းကော်မတီတွင် ပါဝင်သော တနင်္သာရီသဘာဝ ကြိုးပိုင်း စီမံကိန်းမှ ဝန်ထမ်းများ၊ ကုမ္ပဏီများမှ HSE ဝန်ထမ်းများနှင့် အခြားသက်ဆိုင်သူများသည် သုံးလ တစ်ကြိမ် တွေ့ဆုံဆွေးနွေးပြီး ရှေ့ဆက် အကောင်အထည် ဖော်သွားမည့် စီမံကိန်းလုပ်ငန်းများကို ဆွေးနွေး စီမံခန့်ခွဲပေးပါသည်။
- သစ်တောဦးစီးဌာနသည် စီမံကိန်းမိတ်ဖက် ကုမ္ပဏီများ၏ လွှမ်းမိုးမှုမရှိစေဘဲ (၄)နှစ်တာလ ထိန်းသိမ်းရေး စီမံကိန်းလုပ်ငန်းများကို အကောင်အထည်ဖော်ရန် တာဝန်အပြည့်အဝရှိပါသည်။
- စီမံကိန်းလုပ်ငန်းများတွင် ထိန်းသိမ်းရေးလုပ်ငန်းများကို အဓိကခြိမ်းခြောက်နေသည့် တရားမဝင် သားငှက် တိရစ္ဆာန်များကိုအမဲလိုက်ခြင်း၊ တရားမဝင်သစ်ထုတ်ခြင်းနှင့် ကျူးကျော်ဝင်ရောက်မှုများကို ကိုင်တွယ်ဖြေရှင်းခြင်းများပါဝင်ပါသည်။ စီမံကိန်း၏ ရည်ရွယ်ချက်တစ်ခုဖြစ်သည့် ကျေးလက်ဒေသ ဖွံ့ဖြိုးတိုးတက်မှုကို ထိန်းသိမ်းရေးနည်းဗျူဟာတစ်ခုအဖြစ် သတ်မှတ်၍ အလေးပေး အကောင်အထည်ဖော် ဆောင်ရွက်လျက်ရှိပါသည်။ စီမံကိန်းအနေဖြင့် ဇီဝမျိုးစုံမျိုးကွဲများ စောင့်ကြည့်ကြီးကြပ်ခြင်း အစီအစဉ်နှင့် ဥပဒေ စိုးမိုးရေးနှင့် ကင်းလှည့်ခြင်း လုပ်ငန်းများကို အကန့်အသတ်ဖြင့်သာ ဆောင်ရွက်နိုင်ပါသည်။
- ထိန်းသိမ်းရေးလုပ်ငန်းများ အကောင်အထည်ဖော်ရန် နှောင့်နှေးစေသည့် အဓိက အကြောင်းရင်းမှာ လုံခြုံရေး အခြေအနေဖြစ်သည်။ ကရင်အမျိုးသားအစည်းအရုံး လက်နက်ကိုင်အဖွဲ့ဝင်များသည် နယ်ပယ်အချို့ကို ထိန်းချုပ်ထားပြီး တနင်္သာရီသဘာဝကြိုးပိုင်း၏ နေရာအများစုသို့ သွားလာရေး အကန့်အသတ်များ ရှိပါသည်။ သို့သော် ယခုလက်ရှိနှစ်များတွင် ဆက်ဆံရေးကောင်းမွန်စပြုလာပြီး

စီမံကိန်း တတိယအဆင့်တွင် သဘာဝကြိုးဝိုင်းဧရိယာအနှံ့သို့ လုပ်ငန်းများ သွားရောက်ဆောင်ရွက် နိုင်မည်ဟု မျှော်မှန်း ထားပါသည်။

- အစီရင်ခံစာများတွင် ဆောင်ရွက်ပြီးစီးခဲ့သည့် လုပ်ငန်းများနှင့် အသုံးစာရိတ်များသာ အဓိကပါဝင်ပြီး ထိန်းသိမ်းရေးဆိုင်ရာ ရည်မှန်းချက်များ၏ အောင်မြင်မှုများကို ဖော်ပြမှုများ အားနည်းခဲ့ပါသည်။ ထို့ကြောင့် စီမံကိန်းအဆင့်တစ်ခုစီ၏ သုံးသပ်မှုအစီရင်ခံစာတွင် ဆောင်ရွက်သည့် လုပ်ငန်းများမှာ ချမှတ်ထားသည့် လုပ်ငန်းစဉ်များအတိုင်းသာ ဆောင်ရွက်ထားကြောင်း ယေဘုယျဖော်ပြထား ပါသည်။
- သားငှက်ထိန်းသိမ်းရေးအဖွဲ့ (WCS) မြန်မာနိုင်ငံအစီအစဉ်သည် စီမံကိန်းဒုတိယနှင့် တတိယ အဆင့်များတွင် ပူးပေါင်းပါဝင်ခဲ့ပြီးဖြစ်ပါသည်။ WCS အနေဖြင့် စီမံကိန်းကို သားငှက်တိရစ္ဆာန်များ စာရင်းကောက်ယူခြင်း၊ ကင်းလှည့်ထိန်းသိမ်းခြင်း စနစ်များ၊ ခြိမ်းခြောက်မှုများ လေ့လာ စစ်ဆေးခြင်းနှင့် အုပ်ချုပ်လုပ်ကိုင်မှု စီမံချက်ရေးဆွဲခြင်းများအတွက် နည်းပညာများဖြင့် ကူညီပံ့ပိုး ခဲ့ပါသည်။
- နိုင်ငံအဆင့်နှင့် စီမံကိန်းအဆင့်တွင် စီမံကိန်းမိတ်ဖက်များ အကြား အလွန်ကောင်းမွန်သော ဆက်ဆံရေးရှိပါသည်။ နှစ်လတကြိမ် site-level အစည်းဝေးများပြုလုပ်ပြီး ညှိနှိုင်းဆောင်ရွက်မှု များက လုပ်ငန်းများကို ပိုမိုအဆင်ပြေစေပါသည်။ ကုမ္ပဏီ၏ လူမှုဖွံ့ဖြိုးရေးအစီအစဉ်များနှင့် တနင်္သာရီ သဘာဝကြိုးဝိုင်းစီမံကိန်း လုပ်ငန်းများအကြားတွင် ထိပ်တိုက်ဆန့်ကျင်မှုများ မရှိပါ။

၂.၃. ဥပဒေရေးရာမူဘောင်

- ကုမ္ပဏီများနှင့် သစ်တောဦးစီးဌာနသည် ဤထိန်းသိမ်းရေး စံနမူနာအား ဆန္ဒအလျောက် စာချုပ် ချုပ်ဆို ဆောင်ရွက် ခဲ့ခြင်းဖြစ်ပါသည်။ ထိုသို့ဆောင်ရွက်ရာတွင် မည်သည့် ဥပဒေရေးရာ မူဘောင်များ၏ လွှမ်းမိုးမှုများ မရှိခဲ့ပါ။
- အစိုးရမှ တရားဝင်အဆိုပြုထားသော ဥပဒေသစ်တစ်ခုဖြစ်သည့် အမျိုးသားအဆင့် ပတ်ဝန်းကျင် အကျိုးသက်ရောက်မှုအား အကဲဖြတ်ခြင်း (EIA) ကို၂၀၁၄ခုနှစ်တွင် ထုတ်ပြန်မည်ဖြစ်သည်။ ဇီဝမျိုးစုံမျိုးကွဲ အရေးကိစ္စများအတွက် ပိုမိုထိရောက်လုံလောက်သည့် လျော်ကြေးငွေများ အနာဂါတ်တွင် ပိုမိုရရှိလာနိုင်သည့် အခွင့်အရေးများ များလာပါသည်။ ဇီဝမျိုးစုံမျိုးကွဲ အန္တရာယ် ကျရောက်မှု လျော့ချခြင်းလုပ်ငန်းစဉ်များလည်း (EIA) လုပ်ငန်းစဉ်၏ လိုအပ်ချက်တစ်ရပ် အနေဖြင့် ပါဝင်လာမည် ဖြစ်ပါသည်။
- ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး ဆိုင်ရာဥပဒေကို မှီငြမ်းထားသော ပတ်ဝန်းကျင်ဆိုင်ရာ စီမံခန့်ခွဲမှု ရံပုံငွေသည် ဇီဝမျိုးစုံမျိုးကွဲများ ပြန်လည်တည်ထောင်ရန်အတွက်ရံပုံငွေရှာခြင်း၊ လျော်ကြေးငွေ

ပေးဆောင်ခြင်းနှင့် အခြားပတ်ဝန်းကျင် ဂေဟဝန်ဆောင်မှုများကို တန်ဖိုးသင့် ငွေကြေး ပေးဆောင်ခြင်းစသည့် လုပ်ငန်းစဉ်များအတွက် အထောက်အပံ့ပေးနိုင်ပါသည်။

၂.၄. စီမံကိန်း၏အဓိကအားသာချက်နှင့်အားနည်းချက်များ

၂.၄.၁. အဓိကအားသာချက်များ

- ကမ္ဘာ့အရေးကြီး ဇီဝမျိုးစုံမျိုးကွဲ ထိန်းသိမ်းရေးဧရိယာများတွင် ပုဂ္ဂလိကကုမ္ပဏီများမှ ရံပုံငွေ ထောက်ပံ့ခြင်းသည် ထိန်းသိမ်းရေး သဘာဝနယ်မြေများ တည်ထောင်ခြင်းနှင့် စီမံအုပ်ချုပ်ခြင်း လုပ်ငန်းများကို အထောက်အပံ့ပြုပါသည်။
- သစ်တောဦးစီးဌာနအနေဖြင့် ပူးပေါင်းဆောင်ရွက်သော ကုမ္ပဏီများ၏ လွှမ်းမိုးမှုအနည်းငယ်ဖြင့် ထိန်းသိမ်းရေးလုပ်ငန်းများကို ကောင်းမွန်သည့်အခြေအနေတစ်ခုအထိ အကောင်အထည်ဖော် ဆောင်ရွက်နိုင်ခဲ့ပါသည်။
- စီမံကိန်းသည် မူလရေးဆွဲထားသည့် ထိန်းသိမ်းရေး ဆောင်ရွက်ချက်များအတိုင်း လုပ်ငန်းများကို အောင်မြင်စွာ အကောင်အထည်ဖော် ဆောင်ရွက်နိုင်ခဲ့ပါသည်။
- စီမံကိန်း မိတ်ဖက်များဖြစ်သည့် ပုဂ္ဂလိကကုမ္ပဏီများ၊ အစိုးရနှင့် အရပ်ဘက်လူမှုအဖွဲ့အစည်းများ အကြား အလွန်ကောင်းမွန်သောညှိနှိုင်းမှုများနှင့် ပူးပေါင်းဆောင်ရွက်မှုများရှိပါသည်။
- စီမံကိန်းတွင် ပါဝင်ဆောင်ရွက်နေသည့် အဓိကမိတ်ဖက်များ အားလုံးအနေဖြင့် တနင်္သာရီ သဘာဝကြိုးဝိုင်း စီမံကိန်းအပေါ် အကောင်းမြင်စိတ်ရှိကြပါသည်။

၂.၄.၂. အဓိကအားနည်းချက်များ

- ကုမ္ပဏီများအနေဖြင့် တည်ဆောက်ရေးလုပ်ငန်းများ ဆောင်ရွက်ချိန်တွင် အန္တရာယ်ကျရောက်မှု လျော့ချခြင်း လုပ်ငန်းစဉ် အဆင့်ဆင့်များ (Mitigation Hierarchy) ကို လိုက်နာကျင့်သုံးရန် သိသာထင်ရှားသော အားထုတ်မှုများ မတွေ့ရပါ။
- လျော်ကြေးငွေအတိုင်းအတာနှင့် ဆိုးကျိုးသက်ရောက်မှုပမာဏ နှစ်ခုအကြားတွင် ဆက်နွယ်မှု မရှိပါ။ ဆိုးကျိုးသက်ရောက်မှုပမာဏနှင့် ဆောင်ရွက်ပြီးခဲ့သော ထိန်းသိမ်းရေးဆိုင်ရာအကျိုး ရရှိမှုများကို တန်ဖိုးသင့်တိုင်းတာရန် အားထုတ်လုပ်ဆောင်ခဲ့ခြင်း မရှိခဲ့ပါ။ ထို့ကြောင့် ပိုက်လိုင်း များတည်ဆောက်ရေး အကျိုးသက်ရောက်မှုများအတွက် လျော်ကြေးအနေဖြင့် ဤစီမံကိန်းကို အကောင်အထည်ဖော်ခဲ့သည်ဟု ပြောဆိုရန် ခက်ခဲပါသည်။
- စီမံကိန်း၏ စွမ်းဆောင်နိုင်မှုများကို တိုင်းတာရာတွင် လုပ်ငန်းများအား အကောင်အထည်ဖော် ဆောင်ရွက်ခြင်း ပမာဏဖြင့်သာတိုင်းတာပါသည်။ ခြိမ်းခြောက်မှုအန္တရာယ်များနှင့် ဇီဝမျိုးစုံမျိုးကွဲ များ၏ အခြေအနေများအတွက် ချမှတ်ထားသော ရည်ရွယ်ချက်များနှင့် တိုင်းတာခြင်းမရှိပါ။

- ထောက်ပံ့သော ရံပုံငွေသည် သာမန်ထိန်းသိမ်းရေးဧရိယာ ကုန်ကျစရိတ် လိုအပ်ချက်များနှင့် နှိုင်းယှဉ်ပါက သင့်တင့်ပါသည်။ သို့သော် လုံခြုံရေးအခြေအနေအရ ထိန်းသိမ်းရေး လုပ်ငန်းများကို သဘာဝနယ်မြေတစ်ခုလုံးတွင် မဆောင်ရွက်နိုင်ဘဲ သွားလာနိုင်သော ဧရိယာများတွင်သာ ဆောင်ရွက်နိုင်ပါသည်။ ထို့ကြောင့် လက်ရှိထောက်ပံ့မှုများသည် လုံလောက်နိုင်ဖွယ်ရာ ရှိပါသည်။
- စီမံကိန်းလုပ်ငန်းများအတွက် ကတိဝန်ခံချက်စာချုပ်မရှိပါ။ ရန်ပုံငွေများကို (၄)နှစ်တာကာလ စီမံကိန်းအဆင့်များအတွက် အာမခံချက်ပေးပြီး ပိုက်လိုင်းများအသုံးပြုနေသည့် ကာလတလျှောက် ငွေကြေး ဆက်လက်ထောက်ပံ့ပေးသွားမည် ဖြစ်ပါသည်။

၂.၅။ အကြံပြုချက်များ

မြန်မာနိုင်ငံတွင် စီးပွားရေးဖွံ့ဖြိုးရေးလုပ်ငန်းများ၏ အကျိုးသက်ရောက်မှုနှင့် ဆက်နွှယ်၍ ထိန်းသိမ်းရေး အကျိုးအမြတ်များရရှိစေရေးအတွက် စံနမူနာများ ဖွံ့ဖြိုးတိုးတက်စေရန်နှင့် အသုံးပြုသွားနိုင်ရန် အောက်ပါ အတိုင်း အကြံပြုထားပါသည်။ ဤသုံးသပ်ချက်အစီရင်ခံစာ၏ ရလဒ်များ၊ လက်ရှိ အကောင်းဆုံး ဆောင်ရွက်နေသည့် နည်းလမ်းများနှင့် The Biodiversity Consultancy (TBC) အတွေ့အကြုံများ အပေါ်အခြေခံ၍ အကြံပြုထားပါသည်။

- ဖွံ့ဖြိုးရေးလုပ်ငန်းသစ်များအတွက် စည်းမျဉ်းစည်းကမ်းများ ချမှတ်နိုင်ရန် ပတ်ဝန်းကျင် ထိန်းသိမ်းရေးနှင့် သစ်တောရေးရာဝန်ကြီးဌာန (MOECF) အနေဖြင့် ပတ်ဝန်းကျင်ထိခိုက်မှု ဆိုင်ရာဆန်းစစ်ခြင်း (EIA) လမ်းညွှန်ချက်များကို ပိုမိုတိကျစွာ ထုတ်ပြန်ပေးရန် အကြံပြုပါသည်။
 - ဇီဝမျိုးစုံမျိုးကွဲများအပေါ် အန္တရာယ်ကျရောက်မှု လျော့ချခြင်း လုပ်ငန်းစဉ် အဆင့်ဆင့်များ Mitigation Hierarchy (ရှောင်ရှားခြင်း၊ လျော့နည်းအောင်ပြုလုပ်ခြင်း၊ ပြန်လည် ထိန်းသိမ်းခြင်းနှင့် အခြားနေရာတွင် တည်ထောင် ထိန်းသိမ်းခြင်း)ကို အသုံးပြုသင့် ပါသည်။ စီးပွားရေးဖွံ့ဖြိုးရေးလုပ်ငန်း ဆောင်ရွက်သူများအတွက် လမ်းညွှန်ချက်များနှင့် MOECF အတွင်း စောင့်ကြည့်စစ်ဆေးခြင်း စွမ်းဆောင်ရည် တိုးတက်စေရေးများ ဆောင်ရွက်ရန် လိုအပ်မည်ဖြစ်ပါသည်။
 - ဇီဝမျိုးစုံမျိုးကွဲများအပေါ် တိုက်ရိုက်ဆိုးကျိုးသက်ရောက်မှုနှင့် တစ်စတစ်စတိုးပွား လာသော အကျိုးသက်ရောက်မှုများကို အကဲဖြတ်စောင့်ကြည့်ရပါမည်။
 - ဇီဝမျိုးစုံမျိုးကွဲများအပေါ် ဆိုးကျိုးသက်ရောက်မှုများကို တိုင်းတာရပါမည်။ ထို့အတွက် ဦးစားပေး ဇီဝမျိုးစုံမျိုးကွဲများ၏ သွင်ပြင်လက္ခဏာများသတ်မှတ်ခြင်း၊ အကျိုး သက်ရောက်မှုပမာဏကို တိုင်းတာနိုင်ရန်အတွက် ရှင်းလင်းသော တိုက်ရိုက်နှင့် သွယ်ဝိုက် တိုင်းတာသည့်စနစ် (Metrics)များကို အသုံးပြုခြင်းနှင့် ဇီဝမျိုးစုံမျိုးကွဲများကို တိုင်းတာရန် တိကျသေချာသည့် နည်းစနစ်များရှိခြင်းများ လိုအပ်ပါသည်။

- နိုင်ငံတော်အစိုးရ၏ ဇီဝမျိုးစုံမျိုးကွဲထိန်းသိမ်းခြင်းဆိုင်ရာ ရည်မှန်းချက်များဖြစ်သည့် No Net Loss သို့မဟုတ် Net Gain ကိုအခြေခံ၍ လျော်ကြေးငွေပေးဆောင်သောပမာဏနှင့် ဖွံ့ဖြိုးရေးလုပ်ငန်းများ ဆောင်ရွက်ပြီးဆုံးသွားသော်လည်း ကျန်ရှိနေမည့် အကျိုးသက်ရောက်မှုပမာဏများနှင့် ဆက်စပ်မှုရှိရပါမည်။
- ဇီဝမျိုးစုံမျိုးကွဲများပျက်စီးဆုံးရှုံးမှုကို လျှော့ပါးစေသည့်လုပ်ငန်းနှင့် အခြားနေရာများတွင် ပြန်လည် တည်ထောင်ထိန်းသိမ်းခြင်း လုပ်ငန်းများအတွက် လမ်းညွှန်မှုပေးနိုင်ရန် ဇီဝမျိုးစုံမျိုးကွဲ ထိန်းသိမ်းခြင်းဆိုင်ရာ လုပ်ငန်းစီမံချက်ရေးဆွဲခြင်းနှင့် အကောင်အထည်ဖော်ခြင်းများ ပြုလုပ်ရပါမည်။
- စဉ်ဆက်မပြတ်စောင့်ကြည့်စစ်ဆေးခြင်းအစီအစဉ် ပါဝင်ရပါမည်။
- ရေရှည်လုပ်ငန်းများ ဆောင်ရွက်နိုင်ရန် (ကြိုတင်ခန့်မှန်းထားသော အကျိုးသက်ရောက်မှုများ ရှိနေသရွေ့) လျော်ကြေးအဖြစ် ပေးအပ်သည့် ရံပုံငွေထောက်ပံ့ခြင်းများနှင့် ထိန်းသိမ်းရေးလုပ်ငန်းများ စဉ်ဆက်မပြတ် ဆောင်ရွက်နိုင်ရေးအတွက် အာမခံချက်ရှိမည့်အစီအမံများကို သစ်တောဦးစီးဌာန အနေဖြင့် ချမှတ်ရပါမည်။ ဥပမာအားဖြင့် conservation trust funds၊ အာမခံကြေးနှင့် စာချုပ်စာတမ်းများ ပါဝင်ပါသည်။ ၂၀၁၂ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဆိုင်ရာဥပဒေတွင် ဖော်ပြထားသော ပတ်ဝန်းကျင်ဆိုင်ရာစီမံခန့်ခွဲမှုရံပုံငွေသည် ဆက်စပ်လွှမ်းခြုံသော (trust fund) တစ်ခုဖြစ်နိုင်ပါသည်။ သို့သော် လုံလောက်သော ပွင့်လင်းမြင်သာမှုနှင့် ရန်ပုံငွေ အနှောင်အဖွဲ့ကင်းရှင်းမှုများ လိုအပ်မည်ဖြစ်ပါသည်။
- မြန်မာနိုင်ငံရှိ ဖွံ့ဖြိုးရေးလုပ်ငန်းကုမ္ပဏီများသည် တနင်္သာရီသဘာဝကြိုးပိုင်းစီမံကိန်း၏ ကနဦးအားထုတ်မှုများကို လေ့လာ၍ လက်ရှိအကောင်းဆုံးကျင့်စဉ်များဖြစ်သည့် International Finance Corporation Performance Standard 6 and the Business and Biodiversity Program Standard နှင့်ကိုက်ညီပြီး ပိုမိုကောင်းမွန်သော လျော်ကြေးငွေ ထောက်ပံ့ခြင်းအစီအစဉ်များ ပေါ်ထွက်လာအောင် ကြိုးပမ်းဆောင်ရွက်ကြရန် အကြံပြုပါသည်။

3 Introduction

The Taninthayi Nature Reserve Project (TNRP) is a programme being implemented in southern Myanmar whereby payments from private companies have supported the creation and on-going management of a protected area. Payments come from three gas pipeline companies as compensation for impacts on biodiversity along the pipeline route. The project has been running since 2005 and started its third four-year phase in 2013.

This public-private partnership is unique in Myanmar and could form the basis of a model which can be applied to other developments in the country, and beyond. This review documents the main elements of the model, assesses how it was developed and implemented, and highlights some key lessons which can be learned from the project, including through comparison of the model to current recommendations on best-practice in mitigating biodiversity impacts (the terms of reference for the review can be found in Appendix 1). The assessment involved a literature review of project documents and national policy positions, a site visit to the pipeline, and a series of discussions with key stakeholders (Appendix 2).

3.1 Taninthayi Nature Reserve

3.1.1 Reserve description

Taninthayi Nature Reserve (TNR) is a 168,998 ha protected area in Taninthayi Region in the south of the Republic of the Union of Myanmar (hereafter Myanmar). The eastern boundary of the reserve lies on the border with Thailand. The reserve was designated by ministerial notification on 30th March 2005 and is the site of an ambitious partnership between three private companies and the Forest Department of the national government.

The reserve is predominately forested. Land cover on 80% of the reserve consists of mature forest formations, with evergreen dipterocarp forest on higher ground and semi-evergreen in lower areas in the west. The remainder consists of heavily degraded forest and secondary vegetation closer to villages in the west, some deforested hilltops near the Thai border, and extensive areas of bamboo in valley bottoms which may be former village sites (TNRP 2013). The reserve supports resident populations of several species of conservation concern, including Asian Elephant (*Elephas maximus*) (Aung Hla Myo 2011), Asian Tapir (*Tapirus indicus*) (Nay Myo Shwe 2011) and Plain-pouched Hornbill (*Rhyticeros subruficollis*) (TNRP 2013). There have also been occasional signs of Tiger (*Panthera tigris*), but its status in the reserve is unclear (Myint Maung 2011).

Thirty villages are located within four miles of the reserve boundary in Myanmar. An additional 11 villages are located on the boundary or within the reserve (Figure 1). In 2011, the population in and around the reserve was approximately 3,200 households, of which around 430 (approximately 1,800 people) are enclaved within the reserve (TNRP 2013; Sein Moe pers. comm. 2013). The population comprises three main ethnic groups: Dawai, Karen and Mon. Peace groups are active in the northern and southern portions of the reserve: the Mon Pyi Thit Party in the north, centred on the enclaved villages, and the Karen National Union/Karen National Liberation Army in the south (Win May pers. comm. 2013).

3.1.2 Reserve management

According to the recent management plan '*The goal of TNR is to effectively conserve and maintain the biodiversity of the nature reserve, while contributing to the sustainable livelihood of local communities by getting involved in conservation work and to contribute to the establishment of Myanmar's Protected Areas network*' (TNRP 2013).

To achieve this goal, the reserve has the following objectives (TNRP 2013):

- *'Preserve all natural habitat types and populations of important native species and globally-threatened flora and fauna*
- *Improve appreciation and understanding of biodiversity and socio-economic values of TNR amongst stakeholders at all levels*
- *Effectively engage local communities in management planning and implementation of conservation activities inside the Village Use Zone of TNR*
- *Enhance the capacity of the TNR management team so as to effectively manage the natural resources of the TNR and successfully implement conservation activities*
- *Conduct targeted biological survey/research to obtain relevant data that are essential for reviewing and revising the TNR Management Plan at four-year intervals*
- *Implement the conservation activities and law enforcement activities with the aims of reducing threats to TNR.'*

The reserve is managed by a team of 62 (which will increase to 80 during phase 3 of the TRNP), led by a Project Director based in Yangon, with all field activities led by the Park Warden based at the project headquarters in Gangawtaung, near Kan Bauk. Activities are implemented out of eight Local Operating Units (LOU) each in charge of a sector of the reserve (Figure 1).

The reserve has three zones. Each zone has a set of rules for their management. TNR management aims to enforce these rules (TNRP 2013):

- Core Zone (136,347 ha) for biodiversity conservation. No villages¹, roads, or other infrastructure are allowed in this area, and access is restricted.
- Buffer Zone (extending one mile from the western and southern boundaries adjacent to the villages). Subsistence collection of forest products, community forestry and subsistence agriculture are allowed in this area.
- Transportation Corridor. This zone encompasses the pipelines, service track and metering stations. It was originally designated as a belt 100 metres either side of the service track, which was wide enough to include the track and the first pipeline. Two new pipelines have since been built, parts of which are outside this corridor. The corridor needs to be re-defined to recognise the area now occupied by the three pipelines and support facilities.

The 2013 management plan includes a conceptual model for the reserve. The three primary conservation targets identified in this model are (TNRP 2013):

- *'Large mammals (Tiger, Asian Elephant, Sambar (Rusa unicorn), Asian Tapir, Chinese Serow (Capricornis milneedwardsii), primates, otters and Sunda Pangolin (Manis javanica)),*
- *Habitats (hilltop grasslands, bamboo forests, primary forest), and*
- *Hardwood tree species (Dipterocarpaceae and Michelia species).'*

The chief threats to these conservation targets are (TNRP 2013):

- Illegal and unregulated encroachment/habitat conversion for both subsistence and commercial agriculture (including rubber, oil palm and betel) and unregulated resettlement of refugees from minority ethnic groups returning from Thailand.
- Hunting² (both subsistence³ and commercial).

¹Five of the enclaved villages are in the area defined as Core Zone. Insurgent groups are active in these areas and the villages are not yet involved in the TNRP. Buffer Zones will need to be defined for these villages.

²Hunting and trapping is carried out by local residents, people crossing illegally from Thailand, and people involved in the illegal smuggling of cattle and buffalo to Thailand along trails through the TNR.

³Hunting of some species (declared as 'normally protected') is legal for subsistence use in the Wildlife Law (1994), but current practices are considered unsustainable (TNRP 2013).

- Logging (both for local use⁴ and commercial).
- Unsustainable collection of non-timber forest products (NTFPs).
- Forest fire.
- Habitat loss and disturbance of wildlife from infrastructure development/pipelines.
- Illegal mining.
- Construction dams and reservoirs on the reserve boundaries.
- Commercial fishing⁵.

Illegal and unsustainable hunting, logging and unregulated encroachment are considered the most severe threats to biodiversity in the reserve, and probably the whole Taninthayi Region in general (TNRP 2001; TNRP 2013).

To address these threats, the main conservation actions carried out by the TNRP are (TNRP 2013):

- Law enforcement activities which aim to prevent wildlife trade, illegal hunting and logging, and commercial collection of NTFPs.
- Demarcation of the reserve boundary.
- Enforcing application of company Environmental Management Plans (EMPs) during construction and operation of pipelines.
- Engaging with villages around the reserve to control encroachment and unsustainable resource collection. The primary tools being used to address these issues are land-use planning, community forestry, alternative livelihood development and a microcredit programme.
- Environmental education/awareness raising.
- Biodiversity monitoring and research.
- Capacity building of TNRP staff.

3.1.3 Gas pipelines

The northern part of the reserve is bisected by three gas pipelines (Figure 2). Two are active and one is under construction at the time of writing. The pipelines are part of a longer network that transport gas from offshore fields in the Andaman Sea, make landfall at Da Min Seik west of Kan Bauk, and merge just across the border in Thailand. From there, the gas is piped to the Bangkok area to supply gas-fired power stations. The pipelines follow generally the same route through the reserve and are bundled with a concrete service track. At a couple of locations, however, the need to avoid particularly steep slopes has resulted in the pipelines being routed over 1 km apart.

3.1.3.1 Motamma Gas Transportation Company

The Motamma Gas Transportation Company (MGTC) is a joint venture of Total Exploration and Production Myanmar, Myanma Oil and Gas Enterprise (MOGE)⁶, PTT Exploration and Production (PTTEP) and Chevron. The pipeline is currently operated by Total on a 30 year license and ships gas from the Yadana gas field.

The MGTC pipeline was the first to be constructed and was completed in 1996-1997. The pipeline runs for 63 km onshore in Myanmar, of which 55 km is now through the reserve. For most of this distance, a concreted single-lane service track runs adjacent to the pipeline. A metering station⁷ is located at the eastern end of the service track, close to the Thai border.

⁴The harvesting of some timber is allowed for domestic use, for example house construction, but current practices are unregulated and considered unsustainable (TNRP 2013, Bo Ni 2010).

⁵Fishing for domestic use is allowed.

⁶MOGE is a 100% state owned company responsible for upstream operations <http://www.energy.gov.mm/index.php/en/about-moe/menu-moge>.

⁷The metering station measures the quantity and quality of gas at the point of export.

3.1.3.2 *Taninthayi Pipeline Company*

Taninthayi Pipeline Company (TPC) is a joint venture of Petronas Carigali Myanmar Limited (PCML), MOGE, PTTEP and JX Nippon Oil and Energy. The pipeline is managed by Petronas on a 30 year licence and ships gas from the Yetagun field.

The pipeline was constructed in 1998-1999 and follows a slightly different route to the MGTC pipeline, particularly in the western part of route (outside the TNR) where the TPC chose to route their pipeline 3.5 km to the south. This decision was made to avoid an area of steep slopes with soils prone to erosion (Yetagun Development Project 1996). The total length of the onshore portion of the pipeline in Myanmar is 65 km of which 55 km is in the reserve. TPC shares the metering station with MGTC.

3.1.3.3 *Andaman Transportation Limited*

Andaman Transportation Limited (ATL) is a joint venture of PTTEP and MOGE. The pipeline will be managed by PTTEP on a 25 year licence and will ship gas from the Zawtika field.

The pipeline is being constructed during the 2013-2014 dry season and follows a similar route to the TPC pipeline. A separate metering station is being constructed for this pipeline. The total length of the onshore portion of the pipeline in Myanmar is 65 km of which 55 km is in the reserve. Gas will be shipped from the offshore field in 2014, with gas initially flowing through the MGTC pipeline while a new metering station is completed.

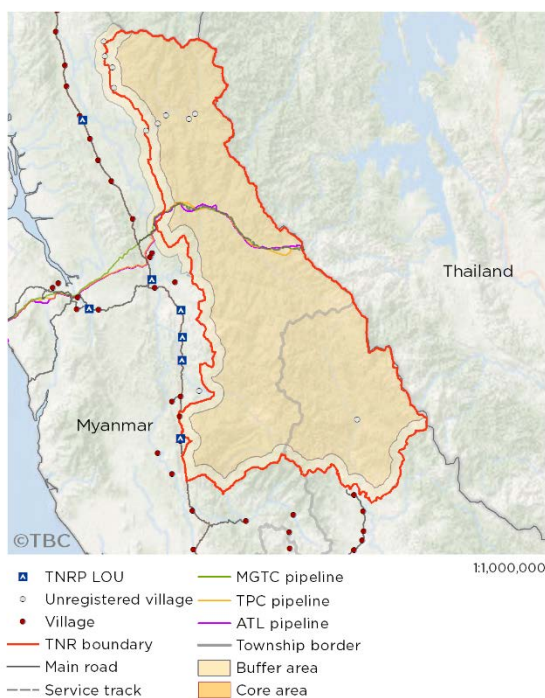


Figure 1: Taninthayi Nature Reserve

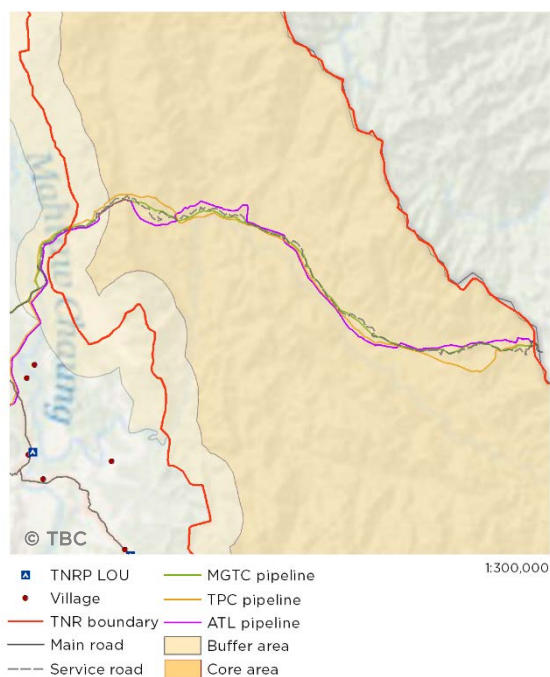


Figure 2: Pipeline corridor across Taninthayi Nature Reserve

4 Overview of the TNRP model

4.1 Project aims and goals

The original project document (TNRP 2001) presents the rationale for the TNRP, including *'The ongoing development of a natural gas transportation corridor across northern Taninthayi Region by MGTC and TPC, the need to manage this corridor in an ecologically sound manner, and the commitment of both companies to contribute to ecologically sound development within the surrounding region, provides a unique opportunity to establish and support the management of a protected area that would contribute to the expansion of the national protected areas system'* (section 2.1, page 3). It also outlines the overall aims and main goals of the TNRP (section 2.2, page 4). The document states *'The project will support the planning, establishment and operation of a protected area between the Dawei and Taninthayi rivers and the Myanmar/Thailand border, including the MGTC/TPC pipeline corridor'*. In addition, the document states *'The basic strategy of the project is to use funding derived from the operation of the MGTC and TPC pipelines to support the establishment and long-term operation of the reserve. Based on the estimated life of the pipelines' operation, funding support could be provided for a period expected to be approximately 30 years.'*

The project document also outlines five long-term 'development objectives' (section 4):

- *'To contribute to the establishment of Myanmar's protected areas network*
- *To contribute to capacity building, especially of field staff*
- *To contribute to the development of awareness of decision-makers, the general public, and subsistence land users,*
- *To contribute to the development of floral and faunal inventories, and of a research capacity in the natural sciences*
- *To contribute to socio-economic and community development in buffer zones and immediately adjacent areas.'*

4.2 Legal framework

There was no clear legal framework for this project at its inception. During project development, a commercial contract was considered, much like those for the management of logging concessions. This would have been able to include clauses potentially linking payments and performance, for example, that funds are released only when certain targets are met. However, this legal framework was not feasible because of issues over jurisdiction of the forest area. The contracting model which has been applied is more similar to those used for donor agreements, with a project description and lump-sum payments which are not linked to performance.

In spite of the project now entering a third phase, contract negotiations are still time-consuming due to the number of government agencies which need to be consulted and their protracted response time. At the time of writing, the phase 3 contract has not been signed by the national government. Bridging funding is being provided by the companies while the contracting delays continue (MGTC has provided the funds during 2013). The phase 3 plan has been approved by the PCC and the FD has submitted it to MOECAP. The plan has been approved by the Minister and has been submitted to the Attorney General, the Ministry of National Planning and Economic Development, and the Taninthayi Region government for comment. Upon receipt of their comments or approval, the agreement will be submitted to the Cabinet for final approval.

Management of the reserve is governed by the 1994 Protection of Wildlife and Protected Areas Law (Wildlife Law) and 1992 Forestry Law.

In considering how to replicate the TNRP model nationally, the 2012 Environmental Conservation Law contains clauses which could provide a legal basis for the development of a national framework for biodiversity compensation or offsets. The most relevant clauses are:

'Chapter IV: Duties and Powers relating to the Environmental Conservation of the Ministry

7. The duties and powers relating to the environmental conservation of the Ministry are as follows:,,,

(m) causing to lay down and carry out a system of environmental impact assessment and social impact assessment as to whether or not a project or activity to be undertaken by any Government department, organization or person may cause a significant impact on the environment;...

(o) managing to cause the polluter to compensate for environmental impact, cause to contribute funds by the organizations which obtain benefit from the natural environmental service system, cause to contribute a part of the benefit from the businesses which explore, trade and use the natural resources in environmental conservation works; ...

8. The Ministry shall establish an Environmental Management Fund in the Union Budget in accord with the financial regulations and by-laws of the Union for effective implementation of environmental conservation works in addition to the receipt from the Union Consolidated Fund.'

Section 7 paragraph (m) has led to the development of an outline set of rules and procedures for the application of EIAs, due to be issued in 2014⁸. These do not, as yet, include reference to the mitigation hierarchy, and the use of offsets for residual impacts, but there may be opportunity for review and revision at a later date.

The TNRP offers a case study in how this compliance might be monitored. During the construction of the ATL pipeline the Forest Department has appointed an Environment Officer to monitor compliance with the company's own Environmental Management Plan (EMP). The officer visits the pipeline on a very regular basis to evaluate whether contractors have followed the EMP and to report lack of compliance where necessary. In addition to ensuring that rehabilitation has been appropriate, this model has contributed to several alterations of the pipeline route, to reduce impacts and landslide risk, and potentially influenced ATL's decision to change a contractor. Since the introduction of the new lead construction contractor, EMP infractions are reported to have been much less frequent.

The main concern, however, on these EIA procedures voiced by respondents during this review is that MOECAAF may not currently have the resources to adequately evaluate, or monitor compliance, with all EIAs to the standard which is being employed with the ATL pipeline.

Section 7 paragraph (o) and section 8 are yet to be elucidated but have the potential to form the legal basis for a future compensation or offset programme. 7(o) indicates that it will be possible to set up a mechanism for ensuring developers pay for pollution (more broadly, we suggest this should be interpreted as for all adverse environmental impacts), use of ecosystem services and resource extraction. Section 8 provides the basis for establishment of a national fund into which such payments could be made. These sections are currently broad, and it will be necessary to develop robust mechanisms that ensure transparency and the appropriate use of contributions (e.g. tying contributions from a development to a specific conservation programme which addresses its residual impacts, rather than into a more general fund).

⁸ These procedures were not available at the time of writing.

4.3 Institutional framework

The TNRP is being implemented by the FD with technical assistance being provided by the Wildlife Conservation Society (WCS) Myanmar Program. Oversight is provided by a Project Coordinating Committee (PCC) consisting of:

- FD Director General (DG), Chairman.
- MOECAF Director of Planning and Statistics Division.
- FD Director of Nature and Wildlife Conservation Division (NWCD).
- MOECAF Director of Department of Environmental Conservation.
- Ministry of Energy (Chief Engineer and Assistant Engineer).
- General Manager, MGTC.
- Health, Security and Environment (HSE) Manager, MGTC.
- General Manager, TPC.
- HSE Manager, TPC.
- Director, ATL.
- Safety, Security, Health and Environment (SSHE) Manager, ATL.

The PCC is responsible for overseeing the successful implementation of the project, including approving work plans and budgets, and evaluating progress against the goals of the project and reserve (TNRP 2001). The PCC composition of high-level representatives of the companies and government departments has strength in that these are the key decision makers in their respective institutions. They are, however, often busy and have not always been available to fulfil the responsibilities of the role. PCC meetings have not taken place as frequently as originally planned and this had implications for project implementation. Of particular concern has been the slow response to technical challenges which needed a more rapid response in order to address issues on the ground

During phase 2, a Technical Committee (TC) was formed to address this problem. The aim of the TC is to 'review the project activities and progress and to hold special meetings whenever required' (Saw Win & Maung Maung Pyone 2013). The technical committee is made up of a representative of NWCD of the FD, TNRP Director, Park Warden, and HSE Managers from MGTC, TPC and ATL. In addition, the TC may invite others to attend the meetings to discuss specific issues or present the results of surveys and studies. The TC reviews implementation progress and any issues which may arise. The TC can develop solutions for any problems and propose alterations to the work plan if necessary. The TC cannot alter the total budget but can approve changes in how the budget is spent.

WCS plays the role of Technical Advisor to the project. WCS provides the equivalent of one person-month of time per year to the project. Areas of support provided by WCS to date have included: training on patrol methods and the use of the SMART⁹ patrol software, development of the conceptual model and logical framework for phase 3, advice on village land-use planning, camera-trapping, and general project management (Soe Win pers. comm. 2013).

4.4 Financing

The model is a simple financial compensation system. The companies make payments to the FD of MOECAF, which uses the funds to pay for reserve management (Win Maw pers. comm. 2013).

The project has operated on four-year funding cycles ('phases'). During phase 1 (2005 to 2008) and phase 2 (2008-2012), the TNRP included two private sector partners, MGTC and TPC, which

⁹SMART is a software package and database which manages the collection and presentation of patrol data <http://www.smartconservationsoftware.org>.

contributed \$1,200,000 for each four-year period (\$600,000 per company per phase) (University of Forestry 2009). ATL joined the project for phase 3 (2013-2016) and total funding has increased to \$1,800,000 over four years (\$600,000 per company per phase).

Each four-year plan is developed by a national consultant working closely with the reserve management team and with input from WCS. The plan includes annual budgets for the four years of implementation (\$300,000 per year 2005-2012, \$450,000 per year for 2013-16). Funding is transferred from the companies to the FD on a quarterly basis. The TNRP Director makes monthly work plans and budget requests which are presented to the DG in Nay Pyi Taw for approval. Funding is released on a monthly basis to a bank account in Yangon for the TNRP Director to access.

The FD pays standard salaries and benefits to its staff from its central budget. Additional field allowances are provided from the TNRP budget.

As international technical advisor WCS receives a contract for ten person-months of time per phase. Any additional involvement is provided through funds raised from other sources (U Than Myint pers. comm. 2013).

4.5 Monitoring and reporting

During the first two phases, progress has been monitored against implementation targets ("response" in a Pressure – State – Response monitoring framework), for example progress in the establishment of community forestry groups or Local Operating Units. There were no targets for addressing threats ("pressure"), or for improvements in the condition ("state") of key biodiversity. In phase 2, however, some data have been collected on threats and condition. Forest cover has been monitored using remote sensing (TNRP 2013), camera trapping is providing some indication of the presence of some key species (Nay Myo Shwe 2011; Hla Myo Aung 2011), and incidences of illegal activities are recorded (now using the SMART system) (Sein Moe pers. comm. 2013).

The need for a project logical framework was identified during the phase 2 mid-term review (BANCA 2011) and was prepared in 2010. It was approved by the PCC in 2013 and is the central guiding document to the implementation of phase 3 (TNRP 2013). In addition to implementation targets (e.g., 'By the year 2017 12 CF users' groups have been formed'), it also includes clear targets to reduce threats (e.g., by 2017 there are 'No more commercial fishing incidences', 'By the year 2017 Rate of deforestation and degradation reduced from 0.001 % and 0.014% respectively'; TNRP 2013). The framework could be strengthened by including targets to improve the condition of key biodiversity features, for example increasing the population of target species.

Monthly progress reports are prepared by the reserve staff and submitted to the Project Director. Quarterly progress reports are prepared by the reserve management team and submitted to the TC and PCC. These reports provide a summary of activities in the preceding quarter, including a summary of the main work carried out, progress towards any annual targets and outputs listed in the logical framework, a summary report from SMART on patrol activities, and financial reporting.

Overall progress against the work plan is evaluated by an external independent review team at the mid-point (two years) and end of every four-year phase. This includes recommendations for improvements that can be made.

A financial audit was carried out by an external auditor in February 2012 for the periods October 2009 to April 2010 and April 2010 to March 2011. Since then, independent audits have been carried out for each financial year.

Progress is also reported during meetings of the TC and PCC. The TC meetings are scheduled to take place in Kan Bauk on a quarterly basis. PCC meeting are supposed to occur on a six-monthly basis and now take place in Nay Pyi Taw. The senior staff involved in the PCC are busy and many

have not been able to attend meetings. PCC meetings have not, therefore, always occurred as frequently as scheduled.

In addition to this formal meeting and reporting schedule, more informal coordination meetings occur at the site on an approximately bi-monthly basis. These involve company site managers, or staff from company socio-economic development/rural engagement teams, and the reserve management team. These meetings provide an opportunity to discuss and coordinate any upcoming activities. This provides a mechanism for avoiding any clashes between the conservation goals of the TNRP and the development goals of the company social programmes¹⁰.

¹⁰The three pipeline companies operate three separate social programmes in the villages along the pipeline route. These programmes operate in some of the villages in the reserve area, but also in others along the pipeline route between landfall and the reserve area. The TNRP has community programmes in several villages that do not receive any other direct assistance from pipeline companies. The MGTC programme offers an example of the sort of activities carried by the companies. It has been active since 1996 in four fields: primary health care, economic support (agricultural extension services and microfinance), education and infrastructure improvement (e.g. bridge repair and road upgrades). All of these programmes are implemented in collaboration with appropriate government agencies.

5 Development and implementation of the TNRP model

5.1 Project development

The timeline of project development is summarised in Figure 3. Initial discussions on the formulation of a project of this type began in 1996 after the completion of the MGTC Environmental Impact Assessment (EIA) and during pipeline construction (F. Crome pers. comm. 2013). The EIA identified three possible routes for the onshore pipeline (ERM 1996). The one chosen was the most expensive to build, but was chosen as it avoided the least disturbed areas of evergreen and riparian forest. The route also followed an existing track. Efforts were further made to minimise impacts by allowing and encouraging woody vegetation to regenerate on all but the area immediately above the pipeline. The initial design did not include a service track, but this was included at the request of the Thai partners. Hervé Madeo, Managing Director of Total E & P Myanmar at that time, approached Francis Crome¹¹ with the idea of doing something additional to mitigation actions proposed in the EIA, in order to conserve the forest and biodiversity of the Taninthayi region and potentially to compensate for some of the residual impacts of the pipeline, particularly possible indirect impacts of the service track¹² (F. Crome pers. comm. 2013).

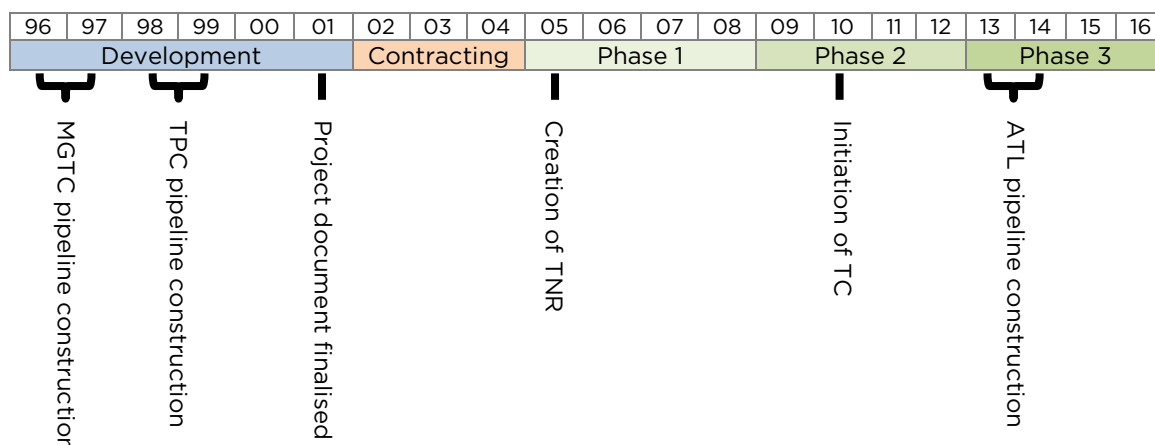


Figure 3: Timeline for the TNRP

Preliminary discussions between Total Myanmar and the project design team¹³ decided that the most appropriate additional action to mitigate for residual impacts of the pipeline was the creation and management of a protected area. Preliminary field investigations (including site visits and interviews with local communities) suggested that what is now the reserve area might meet some of the criteria for designation as a World Heritage Site, and initial discussion between Total and the project development team had this as the ultimate goal of the project. Total secured the approval of the then Minister of Forestry for the project concept and the preparation of a full proposal.

The first proposal from Total to the Ministry of Forestry was for a project to create and manage a very large protected area: an area of approximately 1,100,000 ha was proposed for protection, running from north of the current reserve 300 km south along the Thai border. At the time (in the

¹¹ Francis Crome had led the ecological assessments for the EIA for the MGTC pipeline.

¹² The EIA did not assess indirect impacts in great details but predicted indirect impacts included induced access for hunting and encroachment along the service track.

¹³ The project development team was contracted by Total and included Francis Crome, Earl Saxon and Richard Salter.

late 1990s), there were still regular records of Tigers in the area, and unconfirmed reports of Sumatran Rhinoceros (*Dicerorhinus sumatrensis*). The area also, however, included the main Karen National Liberation Army camp (F. Crome pers. comm. 2013).

The proposal was presented to Total executives at the global headquarters and discussions held with UNESCO over the potential for World Heritage Status. World Heritage Status was deemed complicated and ambitious by the project development team, in part because the nomination process has to be led by the national government which, in this case, had other World Heritage nomination priorities. The project thus proceeded with the proposal of creating a nationally designated protected area.

Respondents have stated that the Ministry of Forestry determined that the proposed area was too large to be managed effectively with the financial resources being made available by the pipeline companies¹⁴ and the capacity of the Ministry at the time. One respondent in this review has also stated that they believed that there was pressure on the Ministry of Forestry not to limit development options in the region by declaring such a large protected area. The Dawei industrial corridor now runs through the centre of the original proposed protected area, and a multi-lane road to Thailand is under construction. The southern end of the original area is now the Proposed Taninthayi National Park.

A final project proposal was completed in August 2001, including contributions from TPC and MGTC (TNRP 2001). We have not been able to determine when, or the precise reason why, TPC became involved. It has been suggested that their involvement might have been a condition of their project approval. Negotiations over contracting took a further three years. This agreement was approved by the Attorney General's Office and the Cabinet. Negotiations were concluded in 2005 and the reserve designated in March of that year.

5.1.1 Motivation for involvement

Understanding the motivations for involvement of the different project partners is important in attempting to determine the long-term sustainability of this model and the likelihood of its effective replication elsewhere.

This review has considered two, not mutually exclusive, reasons for government involvement: a mechanism for reducing the impact of developments and a mechanism for providing financing for protected area management. Consultation strongly suggests that, during the project development period, the main motivations for government involvement were the opportunity the project would provide for the establishment and management of a new protected area and additional income to the Ministry of Forestry. Myanmar became a party to the Convention on Biological Diversity (CBD) in 1994 and this new protected area would help in meeting CBD commitments. At the time, there was a requirement for foreign developments to produce an impact assessment as part of the foreign investment agreement, but no regulations on how the assessment should be carried out and no legal drivers to reduce impacts.

Government interest in models such as the TNRP has since evolved. During this review, the Director General of the FD stated that their primary hope for any wider application of a model like the TNRP was as an incentive for developers to reduce their impacts. The stated secondary hopes for such a model were as a system of payment for ecosystem services (PES) and the sustainable financing of protected areas.

There are several reasons why private sector developments of this type might wish to engage with a model like the TNRP (PWC 2010; ICMM& IUCN 2013):

¹⁴ This review has not been able to clearly determine how the budget total was determined. One respondent suggested that it may have been limited by a decision by Total to dedicate a certain percentage of project capital expenditure.

- Meeting lender requirements. A number of financial institutions, such as the International Finance Corporation (IFC), attach conditions on the management of biodiversity impacts to loan agreements. For example, IFC Performance Standard 6 (also followed by commercial banks under specific circumstances within the Equator Principles) requires developers to follow the mitigation hierarchy and to offset any residual impacts on “critical habitat” (IFC 2012). Such offsets would likely be required in significant developments such as this.
- Aligning with corporate policy positions. An increasing number of companies have corporate goals of No Net Loss, or Net Gain (equivalent to Net Positive Impact), on biodiversity (Rainey *et al.* 2014). Such goals will generally require residual impacts on biodiversity to be offset.
- Regulatory requirements. Many countries now have laws and regulations which require the use of offsets or compensation for certain impacts (Madsen *et al.* 2010; TBC 2013).
- Managing reputational risks. International or national stakeholders will have concerns about the natural environment of a development area. Appropriate management of impacts on priority biodiversity will thus be viewed as important. Protest stemming from actual or even perceived impacts on such biodiversity could have operation impacts such as delays to project implementation, for example, by influencing lender or regulator opinion.
- Managing operational risks. In some circumstances, the conservation of biodiversity around a development project may have tangible benefits in reducing operational risks to the project, such as through control of floods or fire which might damage project infrastructure or have health and safety risks for project staff.

During this review, none of the companies involved reported lender requirements as drivers for the TNRP.

The TNRP is not tied to any explicit corporate policy on compensating for biodiversity impacts. PTTEP hope, however, that their involvement with TNRP provides lessons for improved impact mitigation during construction and operation phases of future PTTEP developments (G. Archer pers. comm. 2013).

At this time there is no Myanmar regulatory requirement for compensation or offsets.

During this review, respondents indicated that the major driver behind their companies’ interest in the TNRP is the management of reputational risk. The pipeline developments have been a source of controversy and the companies have faced accusations of collusion with human rights abuses and more general criticism for operating in Myanmar during a period of international isolation (Earthrights International 2009, 2010). A social development programme was started before pipeline construction, and procedures put in place on standards for labour practices by sub-contractors¹⁵. However, interviewees familiar with the initiation of the TNRP believe that support for a biodiversity conservation project may have been viewed as a way to show that the companies are responsible corporate entities. It has not been possible in this review to clarify whether, or why, the companies believed that a biodiversity conservation project might help manage accusations of poor social performance. It should be noted that, on the contrary, in some circumstances protected areas themselves have been viewed as a constraint on social development (e.g., West *et al.* 2006).

More generally, some individuals - including the then Total Myanmar Managing Director - reportedly believed that forest conservation was “the right thing to do” and personally believed that the companies could, and should, contribute to improving the protection of Myanmar’s forests as part of their social licence to operate, and to manage any reputational risk of constructing a pipeline through tropical rainforest. This view, that the TNRP is necessary and that it is the companies’ duty

¹⁵ Evaluation of the effectiveness of social programmes and labour standards is beyond the scope of this review.

to conserve the forest, persists with all of the current company staff who were consulted in this review.

In addition to helping to manage reputational risk, the TNRP was viewed by some interviewees as managing operational risks. The reserve area experiences very high rainfall, leading to a considerable risk of flooding, erosion and landslides on the steep terrain in the reserve area and these risk damaging the pipelines or support facilities. Maintenance of forest cover is believed by the site managers of all three companies to stabilise the soil and reduce erosion risk, and to regulate water flow and thus reduce flood risk.

Further to all the reasons for engaging, few reasons were reported during this review for companies not to be involved. No company staff consulted saw any significant negative impacts of, or operational constraints from, the project. The financial cost is just a component of their standard social responsibility programme.

5.2 Project implementation

5.2.1 Phase 1

Phase 1 ran from 2005 to 2008 with a budget of \$1,200,000. This phase was principally a start-up period, with the main objectives being: selection of staff, a PCC and technical advisor; establishment of reserve infrastructure and purchase of equipment; capacity building for project staff; and initial reserve management activities (developing patrol protocols, awareness raising in communities, preliminary biodiversity surveys).

The final evaluation of phase 1 found it to be largely successful in implementing the model as designed. Implementation targets and main project objectives were broadly met (University of Forestry 2009). One concern was the difficulty in scheduling PCC meetings, which were found to be taking place at irregular intervals (e.g., one interval of more than 15 months between meetings). This was in part due to the response to cyclone Nargis in 2008, which re-directed FD resources for some time, but also due to the difficulty in aligning the schedules of the senior people involved. Other findings and recommendations in the phase 1 final evaluation were principally concerned with continuing to improve the effectiveness of conservation interventions in the reserve based on the lessons learned during the phase. These recommendations formed the basis of the activities planned for phase 2.

5.2.2 Phase 2

Phase 2 (2008-12) also had a budget of \$1,200,000. The overall objectives of the project remained the same in this phase but activities were expanded and intensified, staff numbers were increased and new LOUs established. The most significant areas of expansion were the implementation of a community forestry programme in several villages along the western border of the reserve, and a series of ecological baseline studies (known as the “National Consultant studies”).

Several significant management changes were instigated in phase 2 that helped improve the implementation of the project:

- A senior Reserve Management Team was created to lead on-the-ground implementation.
- Bi-monthly coordination meetings between the TNRP staff and other stakeholders, particularly social development staff from the pipeline companies, were instigated.
- A Technical Committee (TC) was created to deal with TNRP implementation issues. As it comprised less senior staff, it was able to meet more frequently than the PCC.
- Quarterly progress reports to all project partners were produced.

Independent mid-term and final evaluations (BANCA 2011; Saw Win & Maung Maung Pyone 2013) were carried out for phase 2. These assessed whether the broad objectives are being met and whether specific targets were reached. The final evaluation also investigated the effectiveness of reserve management using the Management Effectiveness Tracking Tool (METT: Stolton *et al.* 2007). The final evaluation found that the TNRP generally continued to be successfully implemented. The METT analysis results stated that ‘the overall score of 75% indicated that the project is satisfactory: however it still needs room for improvement’ (Saw Win & Maung Maung Pyone 2013).

The fact that conservation has not been entirely successful on the ground is not necessarily a failure of the TNRP. Conservation is never 100% successful (Sodhi *et al.* 2004). What is unclear, however, is whether successful conservation actions have been sufficient to compensate for residual biodiversity impacts of the pipeline developments. In future projects, and ideally in future on the TNRP, it will be important to predict biodiversity impacts from development, conservation gains from compensation such as the TNR activities, and thus to identify whether the latter are sufficient compensation for the former.

A land cover change analysis was carried out during phase 2 to evaluate what impact the project might have had on deforestation (TNRP 2013; Bol *et al.* 2013). Remote sensing data from 1990, 2006 and 2010 were analysed and land cover maps developed covering the TNR, a 10 km buffer around the reserve, and the wider region around the reserve and buffer to the coastline. That analysis found that between 1990 and 2006 the deforestation rate in the reserve was 0.008% per year, compared to 0.011% and 0.006% in the buffer and wider area respectively. This covered the pipeline construction period, so some of the deforestation must be attributable to the pipeline. Between 2006 and 2010, deforestation in the reserve was only 0.001% per year, compared to 0.076% and 0.149% in the 10 km buffer and wider region respectively. It is not possible from the analysis, however, to clearly determine how much this low deforestation rate is attributable to the TNRP and how much is simply a consequence of the remoteness of the area, and steep terrain making it unsuitable for agriculture.

The major limits to reserve management success were attributed to:

- Security concerns which restricted access to a large proportion of the reserve.
- Limited capacity of FD staff.
- Rapid turn-over of FD staff who are re-assigned by the FD.

Another continuing issue was the irregularity of PCC meetings. The impacts of this on project implementation has, however, been greatly reduced by the creation of the TC.

5.2.3 Phase 3

The most significant change in phase 3 (2013-2016) is the addition of ATL to the partnership and the increase of the budget to \$1,800,000. This budget increase provides the opportunity to enhance conservation activities to more effectively address the threats, and expand into new areas now that it appears the security situation is improving and more of the reserve will be accessible to TNRP staff.

Other notable changes, resulting from recommendations of the phase 2 evaluations, are the preparation of a conceptual diagram and logical framework for the TNRP. These will help provide a clear structure for the continued implementation of the project.

6 Conclusions, comparison to current best-practice and lessons learned

This review has revealed that the TNRP has to date broadly met its stated goals and objectives:

- The companies have met their financial commitments.
- Stakeholder criticism of pipeline biodiversity impacts has been limited.
- A protected area has been established and managed since 2005, with socio-economic development programmes delivered to surrounding communities.
- The capacity of FD staff involved in the TNRP has been improved.

Further, all project partners who were consulted view the project favourably. They believe that the project is contributing to the conservation of Myanmar's biodiversity, and that this has been done at no operational, and only minor financial, cost to the companies involved. This positive perception has influenced key government decision makers and provided an environment for the development of a more effective national model.

It is not possible, however, to evaluate whether the management of the protected area has, or will eventually, fully compensate for the impacts of the pipelines. This is for three fundamental reasons, which represent the biggest weaknesses of the TNRP model:

- The direct and indirect impacts of the pipelines have not been evaluated and quantified.
- The gains predicted from implementing conservation activities have not been quantified.
- There has been no monitoring to show the real level of reduction in threats to the TNR, or improvement in the status of conservation targets.

In order to evaluate the model and its suitability as a system to apply to other, future, developments in Myanmar, we assessed the TNRP against current best-practice guidelines for the assessment and mitigation of the impacts of oil and gas projects, and the development of biodiversity offset or compensation programmes. Two main frameworks were used: the International Finance Corporation (IFC) Performance Standard 6 (ICF 2012a) and the Business and Biodiversity Offsets Program (BBOP) Standard on Biodiversity Offsets (BBOP 2012). Additional direction on best-practice has been drawn from IPIECA guidance on biodiversity action plans (IPIECA & OGP 2005), the International Council on Mining and Metal and International Union for the Conservation of Nature dialogue (ICMM & IUCN 2013), and Gardner *et al.* (2013).

It is important to remember, however, that the pipeline projects and TNRP were both designed, and began implementation, before PS6 and the BBOP Standard were developed. We do not expect the projects to meet standards that did not exist when the project started. Further, many of the expectations and issues covered by PS6 and BBOP were not widely understood or followed by industry at the time of TNRP inception, and therefore would understandably not have been considered.

Comparison of this project with these standards is, however, appropriate to highlight the most important elements of the project and these frameworks, and to identify key areas for inclusion in this project, other future projects, and national policy on impact assessment and mitigation.

6.1 Review of the pipeline developments against IFC Performance Standard 6

IFC PS6 is the leading framework globally for the management of impacts on biodiversity and ecosystem services. It is therefore the most suitable point of comparison to evaluate how the

pipeline projects have evaluated their impacts on biodiversity and whether appropriate mitigation measures have been put in place.

PS6 is a framework for ensuring projects are developed in a manner which protects and conserves biodiversity, maintains ecosystem services and, where relevant, leads to the sustainable management of living natural resources. PS6 was developed in 2006 and revised in 2012. It consists of a document covering the main issues that need to be addressed (IFC 2012a) and a Guidance Note (IFC 2012b) with further information on interpreting the Standard.

PS6 is becoming a very significant driver of corporate biodiversity management. With broad uptake and support from financial institutions, industry, governments and civil society, it is rapidly gaining recognition as global best-practice. Supporters include many Multilateral Financial Institutions (MFI) and all 78 Equator Principle Financial Institutions¹⁶ (EPFIs). Several national governments have begun to require compliance with IFC Performance Standards in their permitting for new projects.

The underlying premise of PS6 is that projects should identify and seek to avoid impacts on biodiversity and ecosystem services. When avoidance is not possible, measures to minimize impacts and restore biodiversity should be implemented. If residual impact still remains after all action has been taken, specific forms of compensation (biodiversity offsets) should be developed.

The core requirements for a project that fulfils PS6 follow a traditional project planning timeline of screening, scoping, baseline and impact assessment which contribute to or form part of most EIAs or Environmental and Social Impact Assessments (ESIAs). The final step required is integration into an Environmental and Social Management System (ESMS) or equivalent. A number of additional studies, which introduce additional dependencies and pathways, may be required where certain conditions are met. The most important of these relate to situations where Critical Habitat (areas of particularly high global biodiversity value) is known or suspected to exist. This would necessitate a number of additional studies, principally a Critical Habitat Assessment, Biodiversity Action Plan and Biodiversity Offset Plan.

The review against PS6 was based on the EIAs for the three pipelines. It was not possible to carry out interviews with the teams who prepared the documents, and it is not known if other supporting documentation exists. In several areas it has thus not been possible to comprehensively compare performance to PS6. In those cases, we have included our opinion, based on the available evidence, on whether the pipelines are in alignment with PS6. Rather than carrying out a comprehensive paragraph by paragraph assessment of the pipeline development against PS6, this review looks at ten key steps which should be followed by a development to be in alignment with PS6.

1. Screening

PS6 requires a high-level screening of potential project impacts on biodiversity and ecosystem services including consideration of the scale of the project, the technologies used, and possible presence of priority biodiversity features.

- This step typically takes place at a pre-EIA stage. No evidence of such screening is presented in any of the pipeline EIAs reviewed and it is not possible to evaluate whether any such screening was carried out.

2. Scoping

PS6 requires a scoping of potentially important biodiversity in the area of influence of the project. It is important in order to identify issues which may require more in-depth investigation during the EIA. Recommended actions include a desktop review of biodiversity values and ecosystem services in the region of the project, and initial stakeholder engagement.

¹⁶<http://www.equator-principles.com/>

- The MGTC EIA includes some documentation which implies that a desktop review took place but it is incompletely referenced and it is not possible to assess how comprehensive the review was. The ATL EIA indicates that a desktop review took place, but the literature consulted are not adequate for an appropriate review of potential issues. No evidence of a desktop review for the TPC EIA is provided. None of the EIAs include any detail of a process of stakeholder engagement on biodiversity and ecosystem services issues nor the results of any engagement which may have occurred.

3. Critical Habitat Assessment

Assessment of the presence of Critical Habitat should identify whether any globally or regionally important biodiversity features are present at significant levels in the region of the development (TBC 2012). This assessment is a central component of PS6, and the presence of Critical Habitat-qualifying features in the region would demand a high standard of impact mitigation, including the possible implementation of biodiversity offsets.

- No Critical Habitat Assessment was carried out by any of the pipeline projects. This is not unexpected for the MGTC and TPC pipelines as they were developed many years before the Critical Habitat concept was developed. The ATL EIA was developed more recently but also includes no assessment of whether any globally important biodiversity is present.

4. Protected Areas Assessment

PS6 requires that projects demonstrate that they have evaluated whether they will interact with any protected areas and provide evidence that they are in compliance with any laws regarding impacts on these areas.

- No protected areas were present in the region during the development of the MGTC and TPC pipelines and therefore no strategy for working with protected areas was necessary. The TNR was created as a consequence of the pipelines and in close collaboration with the companies. The pipelines are therefore compliant with the reserve regulations. ATL has been developed since the establishment of TNR and is in line with reserve regulations. Clear documentation of compliance with TNR guidelines is, however, lacking in the ATL EIA.

5. Ecosystem Services Review (ESR)

PS6 requires projects to evaluate their interaction with ecosystem services (ES). The value and functionality of ES for affected communities and the flow of ES on which the project is dependent need to be maintained (TBC 2014). The objective of the ES assessment is to identify those ES that fulfil these conditions and develop suitable mitigation so that (a) affected communities do not notice any change in wellbeing after the mitigation measures are applied and (b) the impacts on ES required by the project are minimized.

- No review of ES is documented in any of the pipeline EIAs. It is possible that ES reviews were carried out but were not included in the EIAs.

6. Biodiversity and Ecosystem Services Baseline

A thorough baseline survey of biodiversity and ecosystem services is required by PS6 in order to effectively evaluate the likely significance of impacts from developments. Baseline surveys should involve field studies of biodiversity and consultation with local communities on ecosystem services.

- Limited baseline biodiversity surveys were carried out for all three pipelines. Security concerns were cited as the reason for the limited scope of studies for MGTC and TPC pipelines, which consisted of a rapid on foot reconnaissance of the pipeline route to assess

forest types. The ATL pipeline carried out an analysis for vegetation at points along the pipeline route. None of the pipelines appear to have carried out baseline surveys of fauna, and none of the pipelines carried out surveys in areas other than the pipeline corridor. These surveys do not meet the level of rigour expected by PS6 for clearly understanding baseline conditions and for use in evaluating impacts. The EIAs provide no documentation of a baseline assessment of ecosystem services.

7. Environmental Impact Assessment (EIA)

PS6 requires the impacts of construction and operation of developments on biodiversity to be assessed and documented clearly in EIAs. Impact assessment should investigate the direct, indirect and cumulative impacts of the development. An analysis of alternatives should outline the use of the mitigation hierarchy for measures to reduce the significance of impacts.

- Impact assessments have been carried out for all three pipelines. The EIAs are, however, concerned almost entirely with impacts from construction of the pipelines, and focus on physical environment attributes (for example water and soil). The EIAs have very limited consideration of the impacts on biodiversity. No assessment of indirect impacts was carried out. MGTC present an analysis of possible alternatives, but there is no similar analysis in the TPC or ATL EIAs. Use of the mitigation hierarchy is not explicitly stated in any of the EIAs but measures consistent with the mitigation hierarchy are followed. For example, MGTC avoided an area of forest considered to be in relatively good condition, the width of the service track was minimised, and efforts were made to restore vegetation after construction. Mitigation measures followed by the three companies are, however, inconsistent. Further, there appears to have been no consideration of the cumulative impacts of the three pipelines. A major limitation is that none of the impact assessments evaluate the operational impacts of the developments post-construction.

8. Biodiversity Offset Assessment (BOA)

The BOA is the process required by PS6 for assessing whether there are any significant residual impacts on key biodiversity features (i.e. Critical Habitat-qualifying features) and developing biodiversity offsets in order to achieve No Net Loss or a Net Gain for these features. PS6 recommends the BBOP Standard as a suitable framework for developing offsets.

- The TNRP partially meets these expectations. A more complete review of the TNRP as an offset is provided below (section 4.2).

9. Invasive Species, Pests and Pathogens Management Plan

PS6 requires the potential for accidental introduction of alien invasive species to be evaluated and documented in the EIA. Should a risk of introduction be identified, the development needs to develop a management plan for reducing the risk.

- No documentation of whether an invasive species risk assessment was carried out is provided in the EIAs. It is not possible to determine whether one took place.

10. Biodiversity Action Plan (BAP) and Environmental and Social Management System (ESMS)

A BAP is a plan for the implementation of actions to mitigate impacts on biodiversity. It is the framework for implementation of mitigation and offset actions. It is developed in addition to an ESIA. The BAP is the vehicle for allocation of activities, roles and responsibilities. It can be a stand-alone document, or part of a broader ESMS.

- None of the pipeline companies has developed BAPs. No ESMSs for the MGTC or TPC pipelines were obtained during this study, and it is not clear if they were used during construction. APL has developed an ESMS to manage activities during the construction of the pipeline. None of the companies has an ESMS for pipeline operations.

Conclusion

It is clear that the pipeline developments fall considerably short of meeting the expectations of PS6. It is, however, clear that an accurate, representative review of alignment with PS6 was not possible. Additional documentation from the development of the MGTC and TPC pipelines may have been prepared which was not available during this review. In addition, very little consultation was possible with the teams which carried out the EIAs. Additional research may reveal that more baseline study and more complete impact assessments were carried out, but are not documented in the EIAs.

That the pipeline projects do not meet the expectations of PS6 is not surprising, and should not be seen as a strong criticism. The MGTC and TPC pipelines were developed more than ten years before the first version of PS6 was published, and before many of the issues covered in PS6 were understood by the oil and gas industry. Although more recent, the APL pipeline was also developed before PS6 was widely known. In addition, none of the pipelines used international finance dependent on meeting environmental standards. This review is of value, however, because it highlights lessons learned for biodiversity impact consideration in EIAs and reveals the importance of developing a policy framework which promotes best-practice approaches to biodiversity management such as those outlined in PS6.

6.2 Comparison of the TNRP model with current best-practice on biodiversity offsets.

The use of biodiversity offsets¹⁷, to compensate for residual impacts after the mitigation hierarchy has been rigorously applied, is currently considered the best-practice in impact mitigation (TEEB 2010; Bull *et al.* 2013; Gardner *et al.* 2013). To highlight the main successes and limitations of the TNRP model, it is thus useful to compare it to best-practice for the development and implementation of the mitigation hierarchy and biodiversity offsets. It is acknowledged the TNRP was not set up as an offset programme, and was developed before most of the current thinking on offsets was fully developed. The TNRP model should not, therefore, be expected to meet all the conditions for an offset. This comparison is a useful forward-looking framework to highlight the most significant areas to be included in the creation of a national system.

The BBOP Standard on Biodiversity Offsets (BBOP 2012) includes ten principles, and multiple criteria and indicators for the design and implementation of a biodiversity offset. This Standard is recommended in Guidance Note 32 of PS6 as the leading framework for the development of offsets. It is appropriate therefore, in addition to comparing the pipeline developments to PS6, also to compare the compensation elements of the projects to these additional guidelines. The TNRP has therefore been assessed against these principles (below).

1. Adherence to the mitigation hierarchy: A biodiversity offset is a commitment to compensate for significant residual adverse impacts on biodiversity identified after appropriate avoidance, minimization and on-site rehabilitation measures have been taken according to the mitigation hierarchy.

¹⁷Biodiversity offsets are defined as 'measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development' (BBOP 2012).

- No explicit effort to follow the mitigation hierarchy has been made by any of the pipeline companies. This is a significant weakness of the TNRP model. The importance of following the mitigation hierarchy is also stressed by the IPEICA and ICMM & IUCN guidance and is a fundamental part of any system to mitigate the impacts of development on biodiversity.

MGTC chose to avoid and minimise some impacts on biodiversity but the TPC pipeline was not bundled with the MGTC pipeline, particularly to the west of the TNR where it takes a very different route. Reinstatement of vegetation along the TPC pipeline route has been restricted. The greatest opportunity for avoiding impacts of the ATL pipeline would have been not to have constructed it at all. Some people familiar with the project reported that sufficient capacity exists in the MGTC and TPC pipelines to receive the output from the Zawtika field. Once a decision to build a new pipeline was made, however, some steps were taken to avoid impacts. The pipeline has not opened up a third route, and where possible is located close to either the MGTC or TPC pipelines. One additional significant impact however is the construction of an additional metering station. This will have a direct footprint of 2.5 ha (Pro-En 2009), but will have additional indirect impacts (for example noise and light pollution, increased road traffic, increased number of staff based inside the TNR) which have not been evaluated. The EIA is not explicit on how the impacts will be mitigated during the operational phase, but consultation with ATL staff indicated that vegetation will be allowed to regenerate along the pipeline route.

BBOP criterion 1.1 states 'The developer shall identify, implement and document appropriate measures to avoid and minimise the direct, indirect and cumulative negative impacts of the development project and to undertake on-site rehabilitation/restoration'. None of the EIAs consulted in this review contained analysis of the indirect or cumulative impacts of the pipelines, and only limited consideration of the direct operational impacts on biodiversity. The EIAs focus on the potential impacts during construction, and how to mitigate them, in particular landform rehabilitation to minimise erosion. None of the EIAs includes adequate assessment of operational impacts. The clearest example of this is the difference in on-going management of the two existing pipelines. TPC clears a 20+ m swath along the entire pipeline route. It is grassed over, but tree regeneration is prevented. This fragments the forest and will be a barrier to the movement of some species (for example gibbons). In contrast MGTC has allowed regeneration at all but the 2-3 m above the pipeline along the areas where their pipeline is not bundled with the service track. TPC have chosen not to follow the same operational management as MGTC.

BBOP criterion 1.2 states 'The biodiversity offset shall only address the residual impacts of the development project, namely those impacts left after all the appropriate avoidance, minimisation and rehabilitation/restoration actions have been identified.' This is not possible in the TNRP model as no estimation of residual impacts has been carried out.

2. Limits to what can be offset: There are situations where residual impacts cannot be fully compensated for by a biodiversity offset because of the irreplaceability or vulnerability of the biodiversity affected.

- No risk assessment as to whether the impacts of the pipelines were offsetable was carried out. This is another reflection of the weaknesses in the assessment of impacts on biodiversity in the pipeline EIAs.

Gardner *et al.* (2013) and ICMM & IUCN (2013) both identify this as a critically important issue and that it is essential to evaluate whether there are any impacts that cannot be offset. An example would be impacts which lead to the loss of a large proportion of the global populations of a species. Pilgrim *et al.* (2013) provide a process for assessing offsetability which could be applied in Myanmar.

3. Landscape Context: A biodiversity offset should be designed and implemented in a landscape context to achieve the expected measurable conservation outcomes taking into account available information on the full range of biological, social and cultural values of biodiversity and supporting an ecosystem approach.

- The TNR was designed in the context of the Taninthayi landscape.

The original proposed reserve was 1,100,000 ha and encompassed the full range of values in the region. The final design of the TNR was reduced to 170,000 ha but still retains many of the key values. The TNR contributes to the conservation priorities of the national government. It is a part of the official protected areas network, and is the only protected area which conserves the evergreen dipterocarp forests of southern Myanmar.

4. No net loss: A biodiversity offset should be designed and implemented to achieve in situ, measurable conservation outcomes that can reasonably be expected to result in no net loss and preferably a net gain of biodiversity.

- This is one of the most important elements of a biodiversity offset, and one that is entirely lacking from the TNR model. The TNR does not aim to achieve No Net Loss or Net Gain of biodiversity, and no effort has been made to quantify the direct and indirect impacts of the pipelines, or to quantify the conservation gains from the creation and management of the TNR.

The location and design of the TNR, and the conservation interventions carried out by the TNR, have not been specifically designed to offset the impacts. This last point is related to the concept of equivalency. Gardner *et al.* (2013) and ICMM & IUCN (2013) both list this as one of the most important elements of effective offsets. Equivalency is the concept that the offset should ensure that gains are comparable to losses, and includes consideration of “like-for-like, or better”. This means that gains are of the same biodiversity values as those that are lost, or potentially, gains are made in features of greater biodiversity conservation priority (for example those identified as national or global priorities).

As no quantifications of the losses from the pipelines, or gains from the TNR have been made, it is not possible to state whether the TNR compensates for all of the impacts of the pipelines.

The model is a voluntary, unquantified compensation program. There is no mechanism for linking conservation success with the scale of compensation. The companies are paying a flat rate (\$600,000 per company per phase) regardless of whether or not that is sufficient to mitigate the residual impacts of the pipelines. There are no incentives for them to increase payments should conservation interventions be found to be insufficient, nor any driver for the TNR management to expand or enhance interventions to have greater conservation success.

BBOP criterion 4.3 is concerned with addressing risk and uncertainty in offset implementation. The TNR has not been designed to include any provisions for uncertainty or the risk of failure.

5. Additional conservation outcomes: A biodiversity offset should achieve conservation outcomes above and beyond results that would have occurred if the offset had not taken place. Offset design and implementation should avoid displacing activities harmful to biodiversity to other locations.

- It is highly likely that the conservation outcomes of the TNR are additional to any that would have happened should the project not exist.

Gardner *et al.* (2013) and ICM& IUCN (2013) both also list additionality as a core element of viable offset programmes. No thorough analysis of additionality of the TNR has been carried out, either in the EIAs or as part of this review. The key part of the analysis which has not taken place is the development of counterfactual scenarios, i.e. what would have happened in the area should the TNRP not have taken place. Discussion with TNR staff and the forest cover analysis described above give some indication of whether the TNRP is additional.

A new protected area was created (as opposed to the pipelines funding an existing protected area), and evidence indicates that management has decreased the rate of decline of the key biodiversity values. Land cover mapping indicates that deforestation and degradation inside the reserve is lower than the surrounding landscape (Bol *et al.* 2013) and TNRP staff believe that interventions have decreased the levels of key threats such as logging and hunting (although as yet there are no data to support this).

6. Stakeholder participation: In areas affected by the project and by the biodiversity offset, the effective participation of stakeholders should be ensured in decision-making about biodiversity offsets, including their evaluation, selection, design, implementation and monitoring.

- Stakeholder involvement has been mixed, and often limited, though there clearly have been some genuine benefits realised.

Local stakeholders, in particular residents of villages surrounding the TNR, are significant beneficiaries from the TNRP. Land use planning, community forestry and micro-credit programmes have been initiated in several locations are planned for at least 12 villages around the TNR in phase 3 (TNRP 2013). Importantly, however, local villagers did not participate in decisions over reserve design and have no involvement in reserve management (Sein Moe pers. comm. 2013).

Other stakeholders, such as local government and the pipeline companies, are actively involved in TNRP implementation, either as active members of the PCC, or TC, or through regular consultation and involvement in the development of new interventions.

7. Equity: A biodiversity offset should be designed and implemented in an equitable manner, which means the sharing among stakeholders of the rights and responsibilities, risks and rewards associated with a project and offset in a fair and balanced way, respecting legal and customary arrangements. Special consideration should be given to respecting both internationally and nationally recognised rights of indigenous peoples and local communities.

- The equity of the TNRP has not been fully evaluated in this review. There clearly have been some genuine benefits realised, but the extent to which these are equitable is just as unclear as it is for the equity of biodiversity compensation.

It appears that most of the project risk and responsibility lies within the FD. This may be in large part because the TNR is a part of the official protected areas network of Myanmar over which the FD has full jurisdiction. Other project partners are involved, principally through membership of the PCC or TC, but this review has not been able to determine the extent of their responsibility for the success of the project.

As noted above, the TNRP has a large programme of community support and development, which is helping to recognise community forestry rights of indigenous groups and improve their livelihoods, but local villagers did not participate in decisions over reserve design and have no involvement in reserve management (Sein Moe pers. comm. 2013).

8. Long-term outcomes: The design and implementation of a biodiversity offset should be based on an adaptive management approach, incorporating monitoring and evaluation, with the objective of securing outcomes that last at least as long as the project's impacts and preferably in perpetuity.

- The longevity of the TNRP is unclear. Review and adaptive management has taken place, but at a process level rather than in a way that focuses on conservation outcomes. Monitoring of biodiversity threats and status is a key future need.

The longevity of an offset is of vital importance to its success (Gardner *et al.* 2013; ICMM & IUCN 2013). The 2001 proposal (TNRP 2001) states that the project should last as long as pipeline operation, but it has not been possible in this review to determine whether this is a legally binding obligation or a voluntary commitment. The MGTC pipeline began operating in 1998, thus this commitment lasts through to at least 2028. Under the current model, financing is secured on four-year cycles. However the contracting arrangements were protracted between each phase and the project has only been able to continue due to voluntary bridging funds provided by the companies. The four-year cycles and problems in contracting mean that the financing is not as secure as possible.

The mid-term and final evaluation procedures are laudable and are central to an adaptive management system. Areas of improvement have been identified by this process and changes made (for example creation of the TC and development of a logical framework).

The monitoring framework is, however, a major weakness in the TNRP model. The model, proposal, and implementation through phases 1 and 2 included no monitoring of threats to biodiversity, or changes in its condition (state). The monitoring framework focused solely on implementation targets (response). This is one consequence of the lack of link between impacts and interventions in the TNRP model. There was no need to monitor improvements in the condition of biodiversity as no targets for improvement were set. This is not part of the model. The TNRP simply aims to create and manage a protected area: there are no commitments regarding the effectiveness of the management. The lack of monitoring of threats to biodiversity, or changes in the status of biodiversity targets over the first eight years of the TNRP, means that it is not possible to evaluate whether the TNRP has compensated for all, or even any, of the impacts of the pipelines.

9. Transparency: The design and implementation of a biodiversity offset, and communication of its results to the public, should be undertaken in a transparent and timely manner.

- Project transparency is low, which is unfortunate for such a valuable model. We strongly recommend this current review be made public in some way.

Comprehensive mid-term and final evaluation reports have been prepared for the TNRP, and several ecological surveys have taken place in the TNR (e.g., Nay Myo Shwe 2011; Aug Hla Myo 2011). These were made available for this review, but are not publicly available. Very little information is available in the public domain about the TNRP, its objectives and achievements.

10. Science and traditional knowledge: The design and implementation of a biodiversity offset should be a documented process informed by sound science, including an appropriate consideration of traditional knowledge.

- The best information available at the time, together with local knowledge, was used to design the TNR and guide the development of the conservation interventions (E. Saxon pers. comm. 2013).

WCS has acted as technical advisor to the project since the start of phase 1 and has used the best available scientific knowledge and best practice for protected areas management to guide the advice it gives. Several ecological surveys have been carried out to identify areas of the TNR which are important for priority biodiversity (e.g. mineral licks) and this information has been used to shape management, for example increasing patrol effort in critical areas.

Conclusion

The project aligns with many of the overarching aspirations of the BBOP Principles and Criteria, including compensating for impacts, additionality and a commitment to operate for at least as long as the pipelines. This is laudable considering the project document was produced three years before the establishment of BBOP and 11 before the BBOP Standard, and was never intended as an offset, nor claimed to be one. This indicates that good quality compensation programmes can be developed and implemented using common sense, but that current guidance now available should facilitate development of even higher-quality offset programmes.

7 Recommendations

In addition to areas for improvement identified in the previous section, additional contextual recommendations are made below for the development and application of a model that links development impacts with conservation benefits in Myanmar. These are based on the results of this review, current recommendations on best-practice, and TBC's experience:

- **MOECAAF is recommended to update the EIA guidelines to mandate that all new developments apply the mitigation hierarchy (avoid, minimise, restore and offset) to mitigate their impacts on biodiversity.** Procedures may be needed to ensure that this is applied appropriately by developers and the resources and capacity of MOECAAF will need to be enhanced in order to enable the monitoring of compliance.
- **MOECAAF is recommended to develop EIA guidelines which mandate an assessment of indirect and cumulative impacts on biodiversity.** This will require developers to identify any potential indirect impacts from the project, as well as the cumulative impacts of their development together with others happening in the same area of influence. The significance of these impacts needs to be evaluated and mitigation measures developed to address significant impacts.
- **MOECAAF is recommended to develop EIA guidelines which mandate the quantification of impacts on biodiversity.** This will require the identification of priority biodiversity features (it is impractical to evaluate impacts on all elements of biodiversity), and clear metrics and measures for accounting losses and gains. Assessments of both direct and indirect impacts need to be included (IPEICA & OGP 2005; Gardner *et al.* 2013; ICMM & IUCN 2013).
- **Any new compensation/offset programmes which are developed in Myanmar by the FD or MOECAAF should ensure that the scale of compensation is linked to the magnitude of residual impacts.** One potential mechanism to achieve this is through a regulatory requirement that developments (for example including, but not limited to, mining and quarrying, oil and gas, hydro-power programmes, new roads and ports) should ultimately result in a Net Gain of biodiversity. Regulatory requirements such as this are becoming increasingly common globally (Madsen *et al.* 2010) and are viewed by many institutions as a suitable system to balance the need for economic development with the sustainable management of the environment. Such a system would provide an incentive for developments to minimise residual impacts, and may require the establishment of biodiversity offsets to address any residual impacts. To achieve this:
 - EIAs will need to include an estimation of the residual impacts after application of the mitigation hierarchy, and a quantification of the estimated gains from biodiversity offsets (ICMM & IUCN 2013).
 - Developments should be encouraged to draft and use biodiversity action plans, or enhanced environmental management plans, to guide the implementation of mitigation measures and biodiversity offsets (IPEICA & OGP 2005).
- **Any new compensation/offset programmes which are developed in Myanmar by the FD or MOECAAF should include a robust monitoring programme.** One suitable framework is a pressure-state-response model which includes monitoring changes in the threats to biodiversity (pressures), changes in the conditions of biodiversity values (state) and the implementation of suitable conservation interventions (response).
- **Mechanisms for the long-term (lasting at least as long as the predicted impacts) financing for compensation/offset projects should be developed as part of the design of the compensation/offset project.** Possible systems for this include conservation trust funds, insurance or bonds. Trust funds are the most common approach to date. These are

capitalized by payments from companies, before (or during the early stages) of implementation. This model would ensure that funds are guaranteed for the duration of the project, regardless of any changes in company policy or even sale of the development. Conservation trust funds have been implemented successfully in many countries (CFA 2008) and can provide sustainable finance which is managed in a transparent manner (the funds are usually managed by a board of trustees). These could be set up on a project-by-project basis, or pooled. A potential legal basis for a pooled trust fund for the long-term funding of compensation/offsets lies in the mention of an Environmental Management Fund in the 2012 Environmental Conservation Law. Options for how this fund can be used to finance compensation/offset programmes should be investigated.

8 References

- Aung Hla Myo (2011) A study on wild elephant density, distribution, its correlated ecological factors and threats in TNR. Unpublished report to Taninthayi Nature Reserve Project, Yangon, Myanmar.
- BANCA (2011) Report on Mid-term Evaluation of Taninthayi Nature Reserve Project Myanmar. Unpublished report to Taninthayi Nature Reserve Project, Yangon, Myanmar.
- BBOP (2012) *Standard on Biodiversity Offsets*. Business and Biodiversity Offsets Program, Washington DC.
- Bol, E. T., Liu, X., & Ok, M. H. (2013). Monitoring of land use and land cover changes in and around Taninthayi Nature Reserve (TNR), Myanmar using RS and GIS. *UN/ASCIT* 3: 383-386.
- Bo Ni (2010) Consultancy Report for Community Forestry. Unpublished report to Taninthayi Nature Reserve Project, Yangon, Myanmar.
- Bull, J. W., Suttle, B., Gordon, A., Singh, N. & Milner-Gullard, E. J. (2013) Biodiversity offsets in theory and practice. *Oryx* 47: 369-380.
- CFA (2008) Rapid Review of Conservation Trust Funds. Unpublished report prepared for the Conservation Finance Alliance Working Group on Environmental Funds by Barry Spergel and Philippe Taïeb.
- EarthRights International (2009) Getting it wrong: Flawed “Corporate Social Responsibility” and misrepresentations surrounding Total and Chevron’s Yadana gas pipeline in military-ruled Burma (Myanmar). Unpublished report. Earth Rights International, Chiang Mai, Thailand.
- Earth Rights International (2010) Energy insecurity: how Total, Chevron, and PTTEP contribute to human rights violations, financial secrecy, and nuclear proliferation in Burma (Myanmar). Unpublished report. Earth Rights International, Chiang Mai, Thailand
- ERM (1996) Yadana Project onshore pipeline facilities: Environmental Impact Assessment. Environmental Resources Management (ERM), London, UK.
- Gardner, T.A., Von Hase, A., Brownlie, S., Ekstrom, J.M.M., Pilgrim, J.D., Savy, C.E., Stephens, R.T.T., Treweek, J., Ussher, G.T., Ward, G. & Ten Kate, K. (2013). Biodiversity Offsets and the Challenge of Achieving No Net Loss. *Conservation Biology*. 27: 1254-1264.
- ICMM & IUCN (2012) *Independent report on biodiversity offsets*. Prepared by The Biodiversity Consultancy for the International Council on Mining and Metals (ICMM) and the International Union for Nature Conservation (IUCN), London, England, and Gland, Switzerland.
- IFC (2012a) Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources. International Finance Corporation, Washington DC, USA.
- IFC (2012b) Guidance Note 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources. International Finance Corporation, Washington DC, USA.
- IPIECA & OGP (2005) *A guide to developing biodiversity action plans for the oil and gas sector*. International Petroleum Industry Environmental Conservation Association (IPIECA) and the International Association of Oil and Gas Producers (OGP), London, UK.
- Madsen, B., Carroll, N. & Moore Brands, K. (2010) *State of Biodiversity Markets: Offset and Compensation Programs Worldwide*. Ecosystem Marketplace, Washington, D.C.
- Myint Maung (2011) Survey Report On Evaluating the Status of Tigers. Unpublished report to Taninthayi Nature Reserve Project, Yangon, Myanmar.
- Nay Myo Shwe (2011) A report on Malayan Tapir (*Tapirus indicus*) surveyed in Taninthayi Nature Reserve. Unpublished report to Taninthayi Nature Reserve Project, Yangon, Myanmar.

- Olson, D. M, Dinerstein, E., Wikramanayake, E. D., Burgess, N. D., Powell, G. V. N., Underwood, E. C., D'amico, J. A., Itoua, I., Strand, H. E., Morrison, J. C., Loucks, C. J., Allnutt, T. F., Ricketts, T. H., Kura, Y., Lamoreux, J. F., Wettengel, W. W., Hedao, P. & Kassem, K. R. (2001) Terrestrial Ecoregions of the World: A New Map of Life on Earth. *BioScience* 51: 933-938.
- Pilgrim, J. D., Brownlie, S., Ekstrom, J. M. M., Gardner, T. A., von Hase, A., Kate, K. t., Savy, C. E., Stephens, R. T. T., Temple, H. J., Treweek, J., Ussher, G. T. & Ward, G. (2013) A process for assessing the offsetability of biodiversity impacts. *Conservation Letters*.6: 376–384
- Pro-En (2009) Final Report: Environmental, Social, and Health Impact Assessment (ESHIA) Zawtika onshore gas transportations system. Pro-En Technologies, Ltd. Bangkok, Thailand.
- PWC (2010) *Biodiversity and business risk*. PricewaterhouseCoopers (PWC), London and World Economic Forum, Geneva.
- Rainey, H., Pollard, E., Dutson, G., Ekstrom, J., Livingstone, S., Temple, H. & Pilgrim, J. (2014) Corporate goals of 'no net loss' and 'Net Positive Impact' on biodiversity. *Oryx*, available on CJO2014.doi:10.1017/S0030605313001476..
- Saw Win & Maung Maung Pyone (2013) Final Evaluation Report – Taninthayi Nature Reserve. Unpublished report to Taninthayi Nature Reserve Project, Yangon, Myanmar.
- Sodhi, Navjot S., Koh, Lian Pin, Brook, B. W. & Ng, P. K. L. (2004) Southeast Asian biodiversity: an impending disaster. *Trends in Ecology & Evolution* 9: 654-660
- Stolton, S., Hockings, M., Dudley, N., MacKinnon, K., Whitten, T. & Leverington, F. (2007) *Management Effectiveness Tracking Tool – Reporting Progress at Protected Area Sites: Second Edition*, World Wildlife Fund International, Gland, Switzerland
- TBC (2012) Critical Habitat: a concise summary. Unpublished industry briefing note. The Biodiversity Consultancy, Cambridge, UK. Available at <http://www.thebiodiversityconsultancy.com/wp-content/uploads/2013/07/Critical-Habitat2.pdf>
- TBC (2013) Government policies on biodiversity offsets. Unpublished industry briefing note. The Biodiversity Consultancy, Cambridge, UK. Available at <http://www.thebiodiversityconsultancy.com/wp-content/uploads/2013/07/Government-policies-on-biodiversity-offsets3.pdf>
- TBC (2014) Ecosystem services and IFC Performance Standard 6. Unpublished industry briefing note. The Biodiversity Consultancy, Cambridge, UK. Available at http://www.thebiodiversityconsultancy.com/wp-content/uploads/2014/04/IBN-ES-and-PS6_April-2014.pdf
- TEEB (2010) *The Economics of Ecosystems and Biodiversity: Mainstreaming the Economics of Nature: A synthesis of the approach, conclusions and recommendations of TEEB*. The Economics of Ecosystems and Biodiversity <http://www.teebweb.org/our-publications/teeb-study-reports/synthesis-report/> [accessed 10 December 2013]
- The Environmental Conservation Law (2012) The Pyidaungsu Hluttaw Law No. 9 / 2012. 30th March 2012. Nay Pyi Taw, Myanmar.
- The Forest Law (1992) The State Law and Order Restoration Council Law No. 8/92. 3rd November 1992. Yangon, Myanmar.
- The Protection of Wildlife and Protected Areas Law (1994) The State Law and Order Restoration Council Law No. 6/94. 8th June 1994. Yangon, Myanmar.
- TNRP (2001) Project Document. Establishment and management of a nature reserve in the Taninthayi region, southern Myanmar. Unpublished report of the Taninthayi Nature Reserve Project, Yangon, Myanmar.

TNRP (2013) Taninthayi Nature Reserve Operational Management Plan. Unpublished report of the Taninthayi Nature Reserve Project, Yangon, Myanmar.

University of Forestry (2009) Report on Terminal Evaluation of Taninthayi Nature Reserve Project, Myanmar. Unpublished report to Taninthayi Nature Reserve Project, Yangon, Myanmar.

West P., Igoe J., & Brockington D. (2006) Parks and Peoples: The Social Impact of Protected Areas. *Annual Review of Anthropology* 35: 251–277.

Yetagun Development Project (1996) Onshore biophysical environment report, zone 1. Unpublished report of the Yetagun Development Project for Texaco Exploration Myanmar, Inc. Yangon, Myanmar.

9 Acknowledgements

The authors would like to thank Dr Nyi Nyi Kyaw, Director General of the Forest Department for his full support of this review, and unrestricted access to staff and documentation. The project was coordinated and supported by U Than Myint and staff of the WCS Myanmar Country Program. U Sein Moe not only provided great insight into the design and implementation of the TNRP but also invaluable support during the research period. Many thanks to the villagers of Ye Bon and Zin Ba for their time and patience in answering questions about the TNRP. The authors greatly appreciate the insights and information on the genesis of the TNRP provided by Francis Crome, Earl Saxon and Peter Brown. Martin Cosier provided important guidance on the developing legal framework in Myanmar. Finally the authors are very grateful for the time and assistance provided by U Win Maw and his staff on the TNRP, and to the many staff members of the partner companies who gave their time and honest opinions (a full list is provided in Appendix 2 below).

The Wildlife Conservation Society with funding support from Norway's International Climate and Forest Initiative (Grant No. RAS-2793QZA-13/0563) commissioned this review.

10 Appendices

Appendix 1: Terms of Reference

Documenting the lessons learnt from the Taninthayi Nature Reserve Project as a conservation model in Myanmar

September 2013

Context

The Taninthayi Nature Reserve is internationally important for wildlife such as tiger, globally threatened birds and ungulates. The site is crossed by three pipelines run by Total, Petronas and PTTEP. The Myanmar Forest Department (FD) formed a partnership the Myanmar Oil and Gas Enterprise (MOGE), Total and subsequently the Wildlife Conservation Society to offset the impact of gas pipelines crossing the area linking offshore gas fields to processing facilities in Thailand.

Petronas and PTTEP have joined in the partnership and now contribute funds to manage the area. The project is one of the few examples in SE Asia of the private sector funding a government to conduct conservation activities as well as an example of a government using an international NGO as a paid advisor on conservation related activities.

WCS has developed a Terms of Reference that provides details of proposed approaches, staff and daily rates for a consultancy documenting the lessons learnt from the Taninthayi Nature Reserve Project as a conservation model in Myanmar.

The project aims to provide the Myanmar Government and its partners with documentation of, and lessons learnt from, the Taninthayi Nature Reserve Project (TNRP) model as a tool to promote best-practice with current and future international investors and donors.

Objectives

a. *Document the inception and implementation of the TNRP*

TBC will document the original goals of the TNRP, and how the project was developed (including whether it deviated from those goals and, if so, why). This will involve consultation with partners, particularly MOGE, FD, Total and WCS.

WCS will identify suitable stakeholders and arrange meetings in Myanmar. WCS will also provide TBC with project documentation regarding the development and implementation of the project.

b. *Analyse the legal and institutional framework of the TNRP*

TBC will assess the context and drivers for development of the agreement between TNRP partners, and whether these have significantly changed. TBC will also review the financial model if data are made available.

WCS will arrange meetings with stakeholders familiar with the legal and institutional framework in Myanmar.

c. *Assess the TNRP model to formulate lessons learnt from the TNRP in the current Myanmar context.*

TBC will engage with partners and stakeholders to understand whether the TNRP has met its goals as originally outlined, whether any stakeholder goals have changed over time, and whether significant deviations from the original TNRP plans have assisted achievement of goals. This analysis will help to develop key lessons learned as to the use of such models in Myanmar.

WCS will identify, and arrange meetings with, key stakeholders in Yangon, Nay Pyi Taw and at the project site. WCS will also help arrange logistics for meetings, including a site visit.

- d. *Synthesize the lessons learned to produce recommendations in light of recognized international best practise for future projects and investments in Myanmar.*

Comparative analysis of current best-practice will identify additional lessons which can help the application of this type of model elsewhere in Myanmar. The model will for example be compared to the BBOP Principles and Criteria, and IPIECA and ICMM guidelines on biodiversity impact mitigation.

Outputs

- A preliminary report of findings will be prepared at the end of the country visit (end of November 2013).
- A final draft report of findings will be submitted to WCS by Friday 6th December 2013. WCS will discuss this report with and invite comments from the project partners. WCS will give its feedback to the consultant no later than two weeks from the date of receipt of the draft report.
- The final report, incorporating feedback, shall be made available by end of 2013.

The draft and final reports shall be delivered in electronic form.

The final report will remain the property of WCS, but will be made publicly available following the consultancy.

Workplan

There are 25 days available for this project. This will be sufficient for preparation, the main activities as described above and reporting.

Activity		Sept				Oct				Nov				Dec			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Develop TOR and finalise contract	WCS/ TBC																
Share project documents	WCS																
Literature review	TBC																
Line up interviews and logistics for in-country visit	WCS																
In-country research	TBC/WCS																
Present preliminary findings	TBC																
Prepare report	TBC																
Feedback on draft report	TBC																
Preparation of final report	TBC																

Key Milestones.

Project documentation and other materials shared with TBC:

20th October

Edward Pollard in-country :

18th – 28th November

Preliminary findings prepared:

28th November

Draft report submitted

6th December

Feedback from WCS

13th December

Final report submitted

20th December

Personnel

U Soe Win Hlaing the Former Director General of the Forest Department will be the official counterpart for the project and will be supported by an assistant. Their responsibilities will include providing in-country logistics (organising transport, and accommodation) and arranging meetings with stakeholders. This will be provided through a separate contract the WCS.

Edward Pollard will lead on the project, including the country-visit. The project will be supervised by John Pilgrim. The WCS lead will be Rob Tizard.

Appendix 2: List of key interviewees

Name	Organisation	Job title
Dr Nyi Nyi Kyaw	Forest Department	Director General
U Win Naing Thaw	Forest Department	Director – Nature and Wildlife Conservation Division
U Bo Ni	Forest Department	Director – Watershed Management Division
U Win Maw	Forest Department	TNR Project Director
U Tint Swe	Forest Department	Former Director of TNRP
U Than Naing	Forest Department	TNR Park Warden
U Hla Myo Aung	Forest Department	TNR Environment Officer
U Sein Moe	Forest Department	TNRP Staff Officer
George Archer	PTTEP/ATL	Site Manager
Julius Syauta	Petronas/TPC	Site Manager
Sam De Beer	Petronas/TPC	Security Manager
Paul Bourget	Total/MGTC	Site Manager
U Aung Zaw Win	Total/MGTC	Socio-economic Programme Manager
Peter Brown	PTTEP	Safety, Security, Health and Environment Manager
U Saw Hudson	Total Exploration & Production	Environment & Industrial Hygiene Engineer
U Than Myint	Wildlife Conservation Society	Country Program Director
Martin Cosier	Vermont Law School	Project Leader – Myanmar Environmental Governance Program
Francis Crome	Francis Crome Pty Ltd	Director
Earl Saxon	Forest Inform Partners	Principal Consultant

Appendix 3: Itinerary in Myanmar

Date	Location	Activities
21 st Nov 13	Nay Pyi Taw	Arrival and planning with review team.
22 nd Nov 13	Nay Pyi Taw	Meet Director General and other staff of Forest Department.
23 rd Nov 13	Yangon	Meet with TNRP Director and Environment Officer.
24 th Nov 13	Yangon	Writing up notes from meetings.
25 th Nov 13	TNR	Meeting with community forestry group, TNRP staff and site managers from TPC and ATL.
26 th Nov 13	TNR	Field visit along pipeline service road. Meeting with MGTC Site Manager.
27 th Nov 13	TNR	Meeting with MGTC Socio-economic Programme Manager, and review findings with TNRP staff.
28 th Nov 13	Yangon	Return to Yangon. Literature review and report preparation.
29 th Nov 13	Yangon	Meeting with HSE managers from MGTC and ATL.
30 th Nov 13	Yangon	Debrief with WCS and summary report preparation.