

A status report of the potential for forest carbon schemes to combat deforestation and forest degradation in Papua New Guinea

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Contents:

1. Background	1
2. Broad Description of the Forest Estate.....	4
3. Causes of forest loss and degradation	5
4. Institutional and Policy and legal framework for forest ownership and resource use.....	7
5. Planned national framework for climate change and carbon trading and related activities.	12
6. Unanswered questions surrounding carbon trading policy issues	18
7. Current REDD project activities and actors in PNG	20
8. Application of economic valuations of tropical forest benefits, costs and deforestation in PNG.....	24
9. Identification of underlying policy price and market instruments influencing profitability of resource uses of forest land – income estimates.....	26
10. Concluding Remarks	32

1. Background

Papua New Guinea (PNG) could provide a suitable location for exploring early action in the field of carbon projects. The Prime Minister, Sir Michael Somare, has taken a global leadership role in promoting REDD (Reduced Emissions from Deforestation and Degradation), notably as co-founder and chair of the Coalition for Rainforest Nations, and promoting PNG as a venue for (REDD) trial projects. Moreover, virtually all forestlands in PNG are under customary land ownership, and, whilst this lack of State ownership and control is often viewed as problematic and obstructive to land-use planning and development, community ownership could be advantageous in securing long-term carbon storage through forest protection and facilitating equitable benefits to customary forest owners. Moreover, REDD in PNG offers the added value of conserving some of the most intact and biodiverse tropical forests remaining on the planet.

Currently, despite many years of intermittent and rudimentary policy dialogue on climate change within government agencies, and despite the establishment of an Office of Climate Change and Carbon Trading (OCC&CT) within the Department of the Prime Minister and NEC¹, there remains no national climate change policy in place, and no REDD standards and mechanisms developed or implemented in PNG. Hence current REDD activities have been pioneered by the private sector for voluntary carbon markets. Many players believe such initiatives will eventually transit into a compliance carbon market, which the PNG government plans to develop. This remains to be seen, as there are various players, associated with OCC &ES purportedly advising government on various other ideas to develop REDD activities and carbon trading, whilst advice on policy and processes is also sought from international institutions. There is currently no common position. This compliance market must meet international standards, something which (despite efforts during the 1990s to improve oversight) the logging industry has failed to achieve

¹ OCC&CT is established as an Office within the Department of Prime Minister and NEC. At this stage it has no separate legal status, and no legislated mandate to hire or fire, make contracts, impose levies or other charges or issue directives, outside existing legislation under which the executive Government operates. The Office's name has been constantly changing, and in a recent NEC Decision (Feb.2009) has been referred to as the Office of Climate Change and Environmental Sustainability – in this document it will generally be referred to as OCC&ES

over the last 30 years. Various NGOs have, therefore, been fostering the prompt development and/or adoption of international standards and mechanisms for PNG's nascent carbon trading industry, with the hope that, with independent compliance verification, they will be incorporated into the national policy on carbon trading and financing.

There remains considerable uncertainty over the viability of carbon markets to finance avoided deforestation and forest degradation. There is currently something of a gold rush mentality in PNG with carbon project developers and investors, ranging from certain international merchant banks, NGOs and development partners, to shady backstreet operators ("carbon cowboys") rushing to sign agreements with forest owning communities – in the absence of any climate change policy or carbon trading rules. Other NGOs have been urging caution, insisting upon firm policy and protection of landowner rights and awaiting how events play out. Moreover OCC&ES has recently announced that in their opinion any project agreements will not be valid after 2011.

The OCC&ES has been advising resource owners not to commit to deals with overseas bodies, stating that only the Office can approve carbon trading agreements or contracts, although in the absence of specific legislation this directive appears to be legally invalid, with landowners specified under the Constitution and the *Forestry Act* as owning the trees and having the right to cut them down, or otherwise, and therefore having control over carbon resources contained therein, although in practice agreements with customary owners may be difficult to enforce.

If the State introduced legislation to transfer that control to itself, through OCC&ES, this would likely be challenged on legal grounds as an unjust deprivation of property rights. Although carbon is not specified, there are existing powers under the *Forestry Act* enabling the PNG Forest Authority to acquire rights over forest resources, notably under a Forest Management Agreement (FMA), including access to the timber contained therein, but also for certain other forest resource management purposes, including conservation. These rights are defined in the *Forestry Act* as "timber rights" meaning the rights to 'fell, cut, remove and dispose of growing or dead trees, whether standing or fallen, and any part of such trees, and any other vegetable growth, and the right to plant, grow and manage trees and to carry out regeneration and reforestation work, and in a National forest includes the right to remove gravel and other road-making materials. These rights may only be acquired through the landowners' consent. An FMA is a contractual agreement between the resource owners and the Forest Authority and could provide the Authority rights over the carbon contained within the forest, if agreed.

Once timber rights have been legitimately acquired from the landowners by the Forest Authority they may be reallocated through due process, including through tendering, to a "resource developer" subject to the requirements of the *Forestry Act*, which also requires a Development Options Study be undertaken to provide landowners different resource development options, including, where applicable, options on carbon sequestration and payment for such services. There is no need to change any legislation to provide the Forest Authority the right to trade carbon using an FMA.

With an existing FMA the Forest Authority is limited to what rights have already been agreed (particularly if there are specific limitations), so the Authority could not automatically allocate the carbon rights unless they were specified already or the definition of the rights under that FMA sufficiently broad, otherwise a variation to the agreement must be approved with the resource owners. The Authority could not use the trees for a purpose unspecified or broadly defined in the FMA (which conventionally entails the Authority allocating the trees to a preferred developer and paying the landowners royalties in turn), and if it did, the landowners would be entitled to take legal action for breach of contract, even terminating the FMA. No other organisation, including

OCC&ES can intervene in that process, being exclusively a matter between the two parties to that contract (i.e. resource owners and PNGFA).

The uncertainty over carbon trading is evident in a number of ways: wide estimates in possible returns, lack of policy, concerns over governance and ability to overcome past poor practice, wide variation in the eligibility of forest areas for REDD, doubts over the ability of project developers to deliver upon their promises, saleability of credits, and scepticism that forest communities can coordinate and overcome local disputes between and within social (or clan) groups. It should be noted, however, that, whilst issues related to customary resource ownership may be unique to PNG and other parts of Melanesia, REDD initiatives in other countries also face similar issues and early experience with implementation indicates that, despite positive progress with some carefully designed (pre-)REDD initiatives, the challenges have sometimes been under-estimated by the REDD scheme “promoters”.

The economic value of PNG’s forest carbon is uncertain², but a preliminary economic assessment suggests carbon will not (currently) be a viable alternative (under recent or foreseeable carbon or commodity prices) to reduce deforestation resulting from conversion to oil palm or mining; these industries have affected relatively small areas of forest in PNG at this stage (although causing deforestation of some rich rainforests, including indirectly from inundation, as from the sedimentation of the Fly River from Ok Tedi) and deliver very high area returns³; There is, however, considerable scope for forestry offsets: some estimates claim that the value of carbon greatly outweighs the value of all timber in PNG, while more conservative estimates suggest that carbon may struggle to match potential timber values (volatile commodity prices, including carbon in the voluntary market make forecasts particularly difficult). However, despite these concerns, early indications are that PNG’s forest resource owners look favourably to carbon as an alternative to logging, at least being prepared to re-evaluate decisions to pursue logging in the face of possible carbon schemes, especially considering negative effects widely experienced with logging projects in the country, and other retained benefits from continued access to intact forests, notably for non-timber forest products.

There are several reasons why forest resource owners are attracted to REDD:

First, the money: although, the overall value of carbon may not match the total value of timber, even the lowest estimated returns to landowners look attractive relative to logging. This is because a much higher percentage of carbon payments (anywhere from 40-80%) is, perhaps optimistically, expected to be returned to the landowners than currently applies to timber (5-15%), where most of the earnings on declared log exports⁴ (and domestically processed timber) are retained by the logging company, with profits remitted overseas, whilst the State secures an average 27% of stated export value in log export tax, plus 4% in levies;

² Assessments of the rate of deforestation and degradation and emissions are highly contrasted; see: S. Howes: Cheap but not easy: the reduction of greenhouse gas emissions from deforestation and forest degradation in PNG – a survey of issues. Pacific Economic Bulletin (forthcoming 2009).

³ Internationally vast areas of lowland forest have been converted to oil palm, particularly in Indonesia, and often managed to relatively low standards, sometimes following extensive forest clearance through fire, similarly to some soy bean and cattle development in Brazil. In PNG conversion to oil palm have been on a more limited scale and some industry self-restraint is applied for further conversion, although pressure exists from potential new industry entrants to lower standards and markedly increase planted areas

⁴ Refer to transfer pricing

Second, carbon gives customary owners greater control over their forest because the carbon never leaves the land, thus avoiding the extensive forest damage under prevailing timber permits (largely well below requirements of the Forestry Code of Practice) and the companies reneging on providing agreed benefits, as often prevalent, once the logs have been harvested;

Third, the carbon market will be traded at transparent international prices, unlike timber markets and traders, where the majority of companies are private/family enterprises, with chains of custody difficult to trace (with little known species, unclear prices) and allegations of illegal payments and transfer pricing common; and

Fourth, carbon schemes preserve the forest and its cultural, spiritual, hunting, food and watershed benefits, of immense importance to forest-owning communities.

2. Broad Description of the Forest Estate

In 2002 Papua New Guinea's total forest cover was estimated at 33 million hectares (ha), or 71% of the total land area of 46.1 million ha, comprising:- 25.3 million ha intact rainforest; 3.4 million ha swamp forest; 0.75 million ha dry evergreen forest; 0.6 million ha mangroves; and 2.9 million ha secondary forest degraded by logging⁵.

In terms of forest under threat, there are approximately 5.8 million ha of production forest under existing or potential forest concessions yet to be logged. Additionally, there are 15.5 million ha of reserve forest, some of which could also be subject to future logging, whilst a further 2.9 million ha are susceptible to re-entry logging and/or plantations.

Land and forest classification

The PNG Forest Policy (1990) classifies PNG's forest resources into the following broad categories:

- Production Forests – identified as timber production areas in the long term
- Protection Forests – by virtue of their location, topographic constraints, and ecological, cultural, or environmental considerations
- Reserve Forests – not yet otherwise classified, but upon which a decision will be reached later
- Salvage Forests – forest to be cleared for other land use
- Land Suitable for Reforestation

While the country on the whole seems to have substantial forest coverage, much is in remote and/or inaccessible areas, including water catchment areas, swamps and rugged terrain; i.e. relatively inaccessible to commercial logging and areas of higher population density. Forestry is, therefore, (officially) not permitted in areas subject to extreme constraints and is problematic in areas with serious constraints:

Extreme Constraints

- Land with dominant slopes over 30 degrees.
- Land on altitudes greater than 2,400 metres.
- Permanently inundated areas (>80% of the area).
- Tower and or Polygonal karst landscapes.
- Areas containing mangroves.

⁵ State of the Forests of Papua New Guinea, UPNG, 2008

Serious Constraints

- Land with dominant slope of 20-30 degrees and sub-dominant slope of over 30 degrees and with high relief or;
- Land permanently or near-permanently inundated, extending over 50-80% of the land area of that land.

Forest classification in PNG

Forest Classification Area ('000ha)	
Production	13,748.92
Protection	546.7
Reserve Forests	15,549.09
Salvage	3,910.94
Afforestation Potential	3,241,100
Others	9,413.64
TOTAL	46,410.39

Source: PNG Forest Authority

Rate of forest loss and degradation

In 1975 surveys and aerial photo interpretation (based upon SKAIIPIKSA aerial photography 1973-4⁶) estimated the gross forest resources of PNG to be 33.065 million ha. By 1996 this total had been reduced to a gross of approximately 29 million ha and by 2005 to approximately 25.0 million ha.

The most recent analysis from Shearman et al. (2008) has further refined these figures. They reported that in 1972 PNG had 38 million ha of intact forests, comprised of approximately 33.2 million ha of rainforest, 3.4 million ha of swamp forest, 0.75 million ha of dry evergreen forest, and 0.6 million ha of mangroves. By 2002 there were 25.3 ha of intact rainforest and 2.9 million ha of secondary forest that had been degraded by logging; the other types of forest were comparatively unchanged over the period.

Therefore, according to Shearman et al. (2008), between 1972 and 2002, 15% of PNG's rainforests had been cleared and 8.8% had been degraded to secondary forest. Overall, 7.9 million ha (23.8%) of the 1972 forest had been destroyed or degraded.

3. Causes of forest loss and degradation

According to the recent State of the Forest Report (Shearman et al. 2008), most forest change (48.2%) between 1972 and 2002 was due to logging, followed by 45.6% due to an expansion of subsistence agriculture, 4.4% due to forest fires, 1.2% due to plantations, and 0.6% to the development and operation of mines. What is significant, however, is that this study found that subsistence agriculture was responsible for the majority of deforestation, as opposed to degradation (Table XX).

Drivers of forest change from 1972- 2002: areas of forest affected (millions ha)

⁶ Hammermeister ET and Saunders J C 1995, Forest Resources and Vegetation Mapping of Papua New Guinea, PNGRIC Publication no 4, (CSIRO)

Activity	Degradation	Deforestation	Total area affected	Relative contribution
Logging	2.9	0.90	3.80	48.2%
Subsistence Agriculture		3.60	3.60	45.6%
Fires		.35	0.35	4.4%
Plantations		.15	0.15	1.2%
Mining		.05	0.05	0.6%

(data from Shearman et al. 2008)

Subsistence Agriculture

Subsistence agriculture is the largest cause of deforestation and the second largest driver of forest change, accounting for the deforestation of 3.6 million ha (or 11%) of the intact forest area since 1972 (Shearman et al. 2008). Whilst this figure has been contested as an overestimate (with claims that the increase in subsistence agriculture represents an intensification rather than new deforestation⁷), it is clear that subsistence agriculture is both a major driver of forest loss, pushing back the permanent forest coverage, including to higher elevations, and causing forest degradation, (whether defined as forest, periodically gardened, or gardens under fallow), or tree fallow gardens are progressively less forest biomass. The underlying cause is population growth: over the 1972-2002 reporting period, PNG's population rose from about 2.7 million to 5.6 million. In 2007, the population was estimated at 6.25 million with an average growth rate of 2.7% per year. Given that over 80% of PNG's population relies (wholly or partly) upon subsistence agriculture – and some of these gardens also provide cash crops – a huge rise in gardening pressure (or more intensive use of accessible timber) is unsurprising. Deteriorating rural infrastructure and services over the past 20 years, by contrast, has undermined cash crop agriculture in less accessible areas and encouraged urban migration. Apart from oil palm in 4 provinces, agricultural tree crop production has shown limited growth in either area or output over the past 20 years.

Logging Sector – operation and functioning location and extent of logging concessions

By 2005, 217 logging concessions had been allocated covering 10,501,605 ha. In 2006, 33 of these concessions were in active production covering a total of 5.25 million ha with an average concession size of 159,110 ha (Shearman 2008). Outside observers sometimes argue or assume that this area of forest is therefore doomed to disappear. However, nearly all logging concessions in PNG are designated 'sustainable forest management', meaning that operators are meant to remove trees of a certain diameter and then leave the forest to regenerate for a certain period before another harvest round commences. In practice 'selective' logging undertaken in PNG causes considerable damage to the unharvested residual trees (Vigus 1995), and removes or destroys several times what is extracted for timber, to provide easy access for equipment or for other uses, e.g. log bridges. It also damages freshwater and marine ecosystems affected by increased soil erosion. However, what remains still count as forest ecosystems after the loggers have gone, despite being severely degraded. The situation is exacerbated by extensive salvage logging, with multiple cuts, occurring after the first harvest, causing extensive further forest damage and compacting or encouraging soil erosion and spread of vines, undermining forest recovery.

⁷ Filer C et al, 2008 Deforestation and Forest Degradation in Papua New Guinea, forthcoming

The relatively large area of forest (0.9 million ha, or 24% of the areas logged since 1972) logged and left to regenerate, but not yet deemed as ‘forest’ (Shearman 2008), is consistent with the high level of log exports in the years immediately preceding the study, and indicative of the extent of damage caused by so-called ‘selective’ logging.

PNG's forestry industry shifted from localised harvesting and sawmilling operations, notably for local demand, towards industrial logging for export during the early-mid 1980s, advancing from Manus, New Ireland to the other New Guinea island Provinces in the early 1990s and on then the extensive forested (though less commercially attractive) areas of the Southern Region (Gulf and Western Provinces) in the 1990s and 2000s. One quarter of the forest area logged since 1972 was in one province, West New Britain, accounting for only 6% of PNG's total forest area in 1972. This province alone reportedly lost more than 53% of its full forest cover during that period. A small but significant proportion of this loss (3.2% of the 1972 forested area, or 58,467 ha) was due to forest clearance for oil palm expansion, but a larger proportion resulted from ‘selective’ logging. West New Britain accounted for more than 50% of PNG's total log exports by the late 1990s (Filer 1997), but continues to provide around 30% of log exports (30% by volume in 2005, 26% 2006, 32% 2007 and 30% to November 2008 - SGS), followed by Sandaun Province with 14.6% (by volume) and Gulf Province with 13.5% for 2007. (This excludes processed timber, notably veneer, providing an increasing proportion, especially from Western Province).

Logging companies in PNG are removing the commercial timber resource at an excessive rate partly because the PNG Forest Authority widely overestimated the available forest area and timber volumes in its own inventories (Filer et al., 2008)⁸. Under present regulations, logging companies are allowed to cut all trees with a DBH (diameter at breast height) exceeding 50 cm over a 35-year cutting cycle. Analysis of sample plots logged over areas suggests that timber yields in the second and third cycles are likely to be only 20% of the yields in the first cycle. This disparity can be reduced either by extending the cutting cycle or raising the minimum size limit of the trees cut in the first cycle, but the second option will obviously reduce the initial timber yield, and raising the minimum size limit in subsequent harvests will reduce it still further (Keenan et al. 2005). A 35 year cutting cycle is widely regarded by industry as uneconomic or at least commercially unattractive in most existing concessions, requiring a reduction in allowable annual cut.

4. Institutional and Policy and legal framework for forest ownership and resource use

Oversight of forest management is the responsibility primarily of the PNG Forest Authority (PNGFA) and the Department of Environment and Conservation (DEC), although there is involvement of the Departments of Prime Minister and NEC (notably related to policy aspects), Treasury and Finance, Lands (with respect to the limited State leases, or agricultural conversion under lease-lease backs), as well as the Provincial Governments (under delegation of powers under the Organic Law on Provincial and Local Level Government) and other authorities responsible for oversight of logging companies or other aspects of land use, e.g. Investment Promotion Authority (including company registration), Dept. of Agriculture and Livestock, Internal Revenue Commission, Department of National Planning and Monitoring etc. The Provinces have certain responsibilities with respect to Provincial land-use determination, and resource allocations, notably for Timber Authorities (covering forest clearance for road alignment

and conversion of small areas for agriculture), subject to endorsement by the National Forest Board, and they also hold a position on the National Board.

Virtually all forest lands in PNG are held under customary ownership. Therefore, use of forest resources for industrial logging involves a process in which the landowners negotiate an agreement with the Forest Authority (under an FMA or, until 1992, under a Timber Rights Purchase Agreement – TRP), which in turn allocates forest concessions, following public tender process, to a “developer” registered with the PNGFA, i.e. logging company. Until the new *Forestry Act* 1991 was gazetted in June 1992 logging companies were also able to negotiate Local Forest Agreements (LFAs) directly with landowners using the former *Private Dealings Act*, subject to Ministerial endorsement. Usually in practice a so-called landowner company (normally established with the assistance of the overseas-owned operating company) held the title to the LFA in its name, subcontracting the operating company, which bore little direct legal and financial obligations or risk. The DEC has responsibilities under the *Environment Act* for environmental planning and standards in forestry concessions (also partly addressed under the Forestry Code of Practice, comprising a Regulation under the *Forestry Act*), although in practice since the late 1990s DEC has discarded most of its oversight responsibilities within forest project areas, having laid off the staff in its forestry monitoring section. Agricultural development on customary land, in contrast, requires no formal licence or approval, although Timber Authorities are required under certain circumstances for commercial agriculture, and in practice the DAL/Provincial DPIs may scrutinise and approve larger proposals. Other activities, such as harvesting of insects or fauna (provided there are no endangered or protected species involved, require no approval at all.

Forest planning is the responsibility of the PNG Forest Authority (PNGFA) under the 1991 *Forestry Act*, which commenced in June 1992. A major portion of the forestry projects operating in the 1990s and early 2000s were granted prior to the gazettal of the new legislation, under the less exacting requirements of TRPs and LFAs. Under the Act, forestry activities are administered by boards and committees:

1. *National Forest Board (NFB)* - Heading the PNGFA is the National Forest Board, which manages the affairs and exercises the power of the PNGFA and gives approvals over resource acquisition and allocation and has powers to reject approvals (including TAs) from the Provincial Committees. Composition of the NFB includes government, provinces, industry and civil society, as regulated by the Act.

2. *Provincial Forest Management Committee (PFMC)* - The NFB establishes the PFMC within each Province. The PFMC provides a forum for consultation and coordination of forestry matters between the Provincial Government, National Government, forest resource owners and other stakeholders. The PFMC also consults and make recommendations to the NFB on a range of issues, including who should be awarded logging concessions, approving Timber Authorities (for log harvesting for use by local sawmills for local – i.e. non export – use, and forest clearance for road alignments and land-use conversions to agriculture, subject to various requirements) as well as supervisory functions. The PFMC also assists with the resolution of landowner disputes over forest resources.

The *Forestry Act* requires the Authority to draw up the National Forest Plan (NFP) as a ‘detailed statement of how the national and provincial governments intend to manage and utilise the country’s forest resources’. The first NFP was developed in 1996; it outlines a programme of forest acquisition, and the identification of areas that are deemed suitable for commercial logging. The *Forestry Act* stipulates that the National Forest Plan should include a statement of the annual

allowable cut for each Province, calculated to 'ensure that the areas of forest resource set out in the Provincial Forest Plan are harvested on a sustained yield basis'. The Policy proposes that the allowable cut should be determined using an assumed cutting cycle of forty years (informally amended to 35 years).

Section 54 of the *Forestry Act* provided that forest resources should only be developed in accordance with the National Forest Plan, although an amendment (under legal contest) allows an obsolete plan to be deemed operational. It does not provide a clear remedy in the event that the Plan is not followed.

The *Forestry Act* also mandates the establishment of a single line National Forest Service, replacing the former Department of Forests and staffing under Provincial Forest Divisions. The NFS, under PNGFA's Managing Director, also provides the support and secretariat to the respective Boards and Committees.

Forest Management Agreements

Areas deemed suitable for logging under the NFP are acquired by the State under a Forest Management Agreement (FMA). An FMA is an agreement signed between the resource owners, represented by the identified Incorporated Land Groups (ILGs) of the potential forest area and the PNGFA. The FMA enables the ILGs to give their consent to PNGFA to manage their forest and the latter agrees to manage their forest through various stages of development. In signing the FMA the landowners transfer specified timber rights under specified conditions to the PNGFA, which then can negotiate with potential project developers in full consultation with the landowners. An FMA should be in writing, and monetary and other benefits must be specified; it should have a map of the area and detail the quantity of timber to be cut (if to be used for log harvesting, although it may be used for other purposes, including carbon management or conservation, without any Amendment to the current legislation). The bona fides of customary landowners must be established; an FMA must contain a certificate that verifies the ILGs are genuine – with at least 75% of adult landowners in each Group in favour of the proposed FMA, as specified in writing; (although there is a current Constitutional challenge, arguing that it requires 100% approval or would entail a deprivation of Constitutionally mandated property rights).

Before any FMA can be awarded a series of steps are required under the Act:

1. The planned areas must be initially included in the Provincial Forest Plan (PFP) and also summarised in the NFP.
2. The area must be able to be managed on a sustainable basis.
3. An Inventory must be carried out in the area to verify its sustainability.
4. Landowner awareness and consent must be obtained in open forums before any further work is done leading up to a FMA.
5. Extensive Awareness including advertising the PNGFA intent in all forms of Media shall be undertaken for new project areas as per the NFP.
6. PNGFA shall undertake patrols into the resource area both for awareness and feedback information.
7. Genealogy surveys have to be conducted in proposed forest development areas.
8. Based on the genealogy surveys, Land Groups have to be incorporated through ILG procedures (ILGs are established and registered under the requirements of the *Land Group Incorporation Act*, 1974).

9. An FMA shall only be entered into using ILG and genealogy records obtained by the PNGFA and not any other source.
10. Further advertising of intent to enter into an FMA shall be advertised prior to the final FMA signing, so as to address any potential conflict or interests.

PNG Forest Authority resource acquisition and allocation process

Land for forest development identified		Landowner awareness program		Development options study	
Selection of preferred developer		Call for project proposal		FOREST MANAGEMENT AGREEMENT	Formation of Land Groups
Developer feasibility study		PROJECT AGREEMENT		Approval under Environmental Planning Act	Corporate Formation
HARVEST AUTHORITY		Performance bond and operational planning approvals		TIMBER PERMIT	

Source: Filer and Sekhran 1998

There is some ambiguity with respect to the Development Options Study (DOS), required under the Act, which requires that development options are incorporated into the FMA. However it then only specifies that a DOS is undertaken before tendering a forest development project, which is after an FMA is in place. This would seem an illogical sequence, considering that the PNGFA and landowners by then will have already determined the broad purpose and benefits to landowners under the Agreement. Nevertheless, apart from (logically) amending the legislation to improve the process and avoid pre-determining the purpose and content of the FMA, the process is iterative, (entailing 32 steps before the final approval is made to harvest). It may be necessary to alter the FMA and project agreements with prospective developers, as required also under the Environmental Plan. The DOS should be fully discussed and choices agreed with the resource owners and approved by the PFMC (and local authorities), before incorporation into the Guidelines used for evaluating project applications and determining Timber Permit conditions.

Other forest clearing activities

Under the *Forestry Act* 1971 (as amended in 2005) Sections 90 deal with large scale conversion of forest to agriculture or other land use such as roads, where the amount of proposed clearance of natural forest for the project is greater than 50 ha in total. An application under Section 90 shall not be made where the proposed project is within an FMA, TRP or LFA area, except with Board approval. As the criteria of Section 90 is far less onerous than the FMA approval process, misuse of this Section remains a major concern in controlling logging, because purported development or agriculture or road building projects are often little more than logging by stealth (see below).

Regulation of logging activities and ongoing controversy

The logging industry in PNG has been plagued by allegations of corruption and mismanagement for decades. Whilst weaknesses remain in the legislation and regulations governing forest exploitation, it is the weakness of the PNG Authorities, and specifically the inability of the Forest Authority to effectively monitor and control operations in the field, including penalizing breaches, that has hampered the shift to sustainable forestry, and the application of the Code of Practise. It is clear from a review of forestry statistics that major areas of constrained forest have been logged in the past decades. Filer (1997) observed that almost one third of the forest logged between 1975 and 1996 is classified as non-production forest and should not have been touched. The Government's reviews of proposed and ongoing forest projects undertaken in the early 2000s highlighted extensive breaches in relation to sustainability, environmental and social aspects, including improper project extensions, but, despite public exposure, little action was taken to mitigate the problems, particularly when they applied to major commercial projects, with direct pressure (including political) to circumvent procedures forego firm mitigating action or penalties (including forfeiture).

Problems with forest governance and law enforcement are succinctly summed up in the ITTO's 2007 summary report of PNG:

'The laws governing the PNG forestry sector are regarded as generally excellent, though with far more steps and complexities than necessary. On the other hand, concern is often raised about the capacity of PNG to monitor and enforce its own laws...'

This report concluded that there remain large areas of inadequate monitoring, unsustainable practices and corruption issues systemic within the PNG Forestry sector. These problems are recognised by PNGFA and DEC, acknowledging lack of capacity, budget and political support to properly police the logging industry.

The Commission of Inquiry in Aspects of the Forest Industry (1987-89, Barnett Inquiry) highlighted almost universal transfer pricing by the logging companies operating then. Following the Inquiry Société Générale de Surveillance (SGS) was commissioned (since 1995) to provide independent log export monitoring, which reduced abuse levels over mis-reported quantities, species and grades. However, some operators report consistently below average export prices for traded timber, and other indications indicate continued extensive transfer pricing. Log export tax is applied in PNG largely in the absence of declared profits and corporate tax by logging companies. Landowners receive modest royalties for their logs, and the State and landowners receive next to nothing on processed timber. Some valuable species are banned from export in log form, but are, without export tax being paid.

Recently, SGS launched a timber tracking and legality system with Malaysian logging giant RH, claiming legal verification of concessions in PNG. However many NGOs regard this system as flawed since there is no active National Forest Plan, and, upon this and other grounds (e.g. lack of detailed project inventories and failure to apply sustainability criteria), argue that few if any timber permits are currently valid, particularly new logging concessions or extensions; the issue and legislation is currently subject to a judicial review.

Other major issues with forestry are lack of sustainability and failure of logging companies to deliver socio-economic benefits, as required under Timber Permits and project plans. The first issue has not been addressed, and is outside the responsibilities of the ongoing SGS log export monitoring, although some forestry industry lobbyist misguidedly refer to SGS as verifying

legality; moreover, in the absence of a Forest Plan and inventories, it is difficult to see how any claims to sustainability can be made at this time. The failure of forestry to deliver requisite socioeconomic benefits has even been recognized by the industry. The most criticized company, RH, blames this upon “poor administration, regulation, and a lack of focus on socio-economic benefits and down-stream processing, as well as weak infrastructure and service delivery, a weak financial sector, customary land tenure, maladministration and a high level of crime” (ITS Global, 2006)⁹.

While these factors are undeniably true, NGOs point out that operators continue to use this same lack of capacity and landowner awareness, particularly in remote rural locations, to continue logging disputed concessions (e.g. the ongoing Wawoi Guavi case, soon to go to trial). A recent Supreme Court Ruling on an extension of a Timber Permit (from Wawoi Guavi) to embrace the largest remaining unharvested forest resource, namely Kamula Doso FMA in Western Province, found RH to have obtained and sought to retain the extension through a process of falsification. Legislative amendments have been made to enable retroactive compliance, when projects had been improperly extended or other processes not followed properly (e.g. extending the long expired National Forest Plan to enable projects to be deemed compliant).

5. Planned national framework for climate change and carbon trading and related activities.

The situation with REDD readiness in PNG and the structure of the administrative bodies has been very dynamic in recent months. During the Bali COP meeting PNG clearly flagged the country’s desire to be at the forefront of REDD. In response PNG reticently launched a series of initiatives: the formation of the Office for Climate Change and Carbon Trading (now OCC&ES); the signing of the PNG-Australia Forest Carbon Partnership; PNG’s submission and acceptance in the World Bank Forest Carbon Partnership Facility; and, most recently joining the UN-REDD Programme.

However, the rhetoric has not been matched by coordinated action on the ground – this has become something of an embarrassment for the PNG Government and in the last month various adjustments have been made to clarify OCC&ES’s role. The latest sign that the Government wishes OCC&ES to be a coordinating office, rather than trying to control – and presumably profit from – carbon trading, was the recent decision to change the name of the to the Office to Climate Change and Environmental Sustainability (OCC&ES). However, this new title conflicts with the mandate of DEC, so some observers expect further changes – generally the Office is referred to within the confused PNG bureaucracy, simply as OCC.

Below is a potted history of the PNG Government steps to develop a nation climate change and carbon framework over the last year.

Office for Climate Change & Environmental Sustainability (OCC&ES)

In late 2008, the Office for Climate Change and Carbon Trading (OCC&CT) was established with a mandate from Cabinet to develop PNG’s (long stalled) climate change policy and manage carbon trading; this Office is the Designated National Authority (DNA) under the UNFCC

⁹ ITS Global, 2006. Whatever it takes: Greenpeace's anti-forestry campaign in Papua New Guinea *Report for Rimbunan Hijau (PNG) Group*

reporting process. OCC &CT sits under the Department of the Prime Minister & NEC. OCC&CT's scope of responsibility remained unclear but the Executive Director has claimed the Office would have sole responsibility for carbon accounting, project registration, verification and trading. OCC&CT demanded that all carbon developers and projects be registered with the Office and was charging developers a PGK 10,000 registration fee. However, it has as yet no legal mandate to require this registration, and, the Office has since admitted this registration charge was an error. This casual approach highlighted critics' concerns that the establishment of the Office was not legally established and suffered from a perception that certain players were attempting to use the OCC&CT to garner income¹⁰.

In addition to the recent decision to change the name of the OCC&CT, it appears that the Government has decided to establish a consultative and oversight process to secure greater international and domestic advice and credibility and provide a greater semblance of transparency. At this stage the policy decision focuses upon establishing positive impressions and developing processes for policy preparation, rather than proposing tentative or tangible initiatives for addressing climate change or carbon trading in PNG's social and legal environment. It is intended that the policy development and implementation, including oversight of the OCC&ES, will be guided by a somewhat unwieldy and potentially exorbitant three board structure:

1. A **Technical Advisory Board** to assess the science, methodology etc. The technical advisory role is envisaged as being made up of named and unspecified experts, including from Universities in PNG, PNGFA, including its Research Institute, Agriculture Department and international and domestic institutional representatives, as it is acknowledged there is a lack of capacity within the country. They are expected to provide advice and sustainability to the process within PNG.
2. A **National Climate Change Board** made up of major stakeholder groups including landowners, an environmental NGO representative, business sector representatives, including the Forest Industry Association, to provide a reasonably broad spectrum of policy stakeholders. International development partners may also have a seat on that board.
3. An **Independent Advisory Board** comprising selected internationally known scientists and economists and other figures and institutions from the field of climate change. This international board is intended to ensure international credibility and technical expertise, and perhaps mediate between potential stakeholder differences and provide constructive linkages to international technical resources, whilst providing institutional or political leverage. It is unknown whether these persons or institutions have consented to participating on this Board, and in some cases may feel bound, for legal, institutional policy or other grounds, to remain at greater arms length;

Planned advisory and payments structure for OCC&ES

In terms of payments, the PNG Government is intending to set up an independent and purportedly transparent financial system, comprising a Climate Change Trust Fund (from international grants or carbon trading) perhaps administered by a board of key international stakeholders, though international institutions are generally reluctant to sit on such boards for legal and prudential reasons. (It is unclear at this stage what the role of the International Advisory Board will actually be, as the NEC Decision is unspecific).

¹⁰ The Governor of Eastern Highlands Province, Malcolm Kela-Smith, arguably the instigator of carbon trading in PNG, has been particularly vocal on this matter, feeling OCC&ES has no legal mandate.

The trust fund will be associated with the OCC&ES but it expected to be independent from the Office. Its credibility, its Trust Deeds and Constitution, the role it is to play, who's funds it is managing and for what purpose, and the composition of its management and the Trustees and the mechanism of their appointment and succession will all be critical for its credibility.

The PNG Government has, unfortunately, over many years failed to establish a good track record with Trust Funds, of which there are thousands established, many forgotten, unknown or unaccounted for, including major Trust Funds in the Forestry and natural resources sector (including for reforestation). Where Stabilisation, Trust or Endowment Funds have performed better in PNG it has been the result of a transparent tracking process, largely at arms length from Government (even if managing public funds), impartial board membership, with members appointed independently without discretionary arrangement by a Minister or senior official, and effective independent oversight and checks and balances, entailing independent and respected fund management.

World Bank Forest Carbon Partnership Facility (FCPF)

In July 2008, PNG submitted a Readiness Plan Idea Note (R-PIN) and in October 2008 this was accepted into the second round of countries to join the World Bank Forest Carbon Partnership Facility (FCPF). PNG is now required to undertake REDD readiness activities towards establishing, institutional and policy framework to address climate change and carbon trading, establish qualitative and quantitative carbon methodologies, and develop a national carbon baseline. The R-PIN was prepared and submitted by the Department of Environment and Conservation (DEC), which at that time was responsible for climate change policy.

According to the R-PIN six steps are immediately required by PNG:

- Step 1: Carbon assessment and monitoring
- Step 2: Policy, legal and planning
- Step 3: Communication, education and awareness
- Step 4: Capacity Development
- Step 5: Demonstration activities
- Step 6: Monitoring and evaluation needs to be put in place:

UN-REDD Programme

At the Government's invitation (GoPNG), a joint mission involving the Australian Government (AusAID; Department of Climate Change), FAO, UNDP, UNEP, Norway (International Climate and Forest Initiative; Norad; Rainforest Foundation), and World Bank (PNG Office) took place 23-30 October 2008. The aim of the mission was to further the planning of donor support for REDD-related efforts in PNG, and increase the international development partners' knowledge of the forest context in PNG and possible approaches to build capacity to implement a REDD program in PNG, and coordination of efforts among donors.

GoPNG sought mission assistance to develop a comprehensive plan for PNG on all aspects of REDD with a detailed workplan, or road map, for the OCC&ES. In addition, the mission sought to:

- Identify a process to progress inputs from development partners to ensure a coordinated package of support underpinning PNG's REDD Readiness Roadmap (commenced)
- Set out the critical path and milestones to achieve readiness to implement a REDD program in PNG (to be undertaken with initial donor support)

- Distribute responsibilities for development partner support for PNG's development and implementation of the Roadmap based on comparative advantage (commenced)
- Establish parallel streams of deliverables, timelines, staffing requirements and budgets associated with implementing the Roadmap (not commenced due to complexity of the task and need for additional resources to support)
- Provide elements of a standardised REDD readiness process that will be useful for other Coalition for Rainforest Nation countries (yet to be undertaken)

The format and content of the draft Roadmap was based on the basic building blocks of REDD Readiness, as set out in various documents, including:

1. UN-REDD Programme Framework Document
2. October 2008 draft of the FCPF's R-Plan template
3. Eliasch Report October 2008

Beyond these building blocks, the roadmap was informed by a number of factors influencing the mission:

- The guiding principles of the UN-REDD Programme as per the Framework Document: human rights-based approach, with particular reference to the UNDG Guidelines on indigenous peoples' issues, gender equality, environmental sustainability, results-based management and capacity development
- The PNG-Australia Forest Carbon Partnership and the initial scoping exercise undertaken by Australia prior to the joint mission
- The dimensions of importance to the Norwegian delegation: governance, land owner rights, NGO and civil society role in the REDD process, benefit sharing / payment distribution.

Through a number of iterations, the roadmap currently comprises 6 components:

1. Management of Readiness
2. Reference scenario of forest emissions
3. Monitoring and reporting
4. Identification of REDD strategies
5. REDD implementation framework
6. Stakeholder participation

The UN-REDD/AusAIDUND roadmap appears to be the latest attempt to coordinate REDD readiness activities. The roadmap lays out a path for closer collaboration of key agencies, such as OCC&ES, PNGFA and DEC, and will attempt to weave in greater stakeholder engagement – an initial US\$0.8 mill has been earmarked for this purpose. The UN-REDD and other initiatives such as the FPCF and PNG-Aust. Carbon partnership can all be undertaken concurrently as they will involve the same players and same aim – to help lay the foundation for national carbon accounting and REDD readiness.

Status of Climate Policy in PNG

The Government has been very slow in climate change policy formulation, despite the fact that Papua New Guinea was an active participant in the evolving international Environment and Development debate from Rio in the early 1990s and ensuing Climate conventions, and despite constructive dialogue on sustainable development, climate and carbon trading initiatives from academia, within the public sector and the private sector from the late 1990s. The development of a climate change and particularly carbon trading policy process has been ongoing, though

sporadically, for the best part of this decade, under the auspices successively of the Departments of Environment and Conservation, then Planning, back to DEC and now OCC&ES.

OCC&ES has now appointed a large staff, with about 67 positions, but with no field capacity outside the National Capital and limited relevant technical skills or professional experience to date. There is some public concern that the exercise is less about PNG's contribution to planning for and seeking to mitigate Climate Change, globally or locally, than about pursuing the international climate dollar. If, however, credible measures can be developed and implemented capable of safeguarding PNG's extensive tropical forests, which have been substantially degraded through supposed selective logging over many years, by providing tangible benefits to the resources owners, who will ultimately determine whether their forests are retained or otherwise, then the outcome will firmly be beneficial, in terms of GHG mitigation, providing broad-based development benefits (including poverty alleviation and addressing MDGs in remoter rural areas of PNG) and preserving PNG's rich forest and watershed biodiversity.

Moreover, as stated above, resource owners are already legally entitled under the Constitution and *Forestry Act* to utilise, including trade, their own trees, (including the carbon resource contained therein). Apart from the landowners themselves, only the PNGFA has the legal mandate (subject to specific contractual agreement with the landowners, including over benefits accruing to them) to manage and trade their timber or carbon resources with any outside partner.

On 11 February 2008, following a series of earlier NEC Policy Decisions related to the establishment of OCC&ES, NEC approved a consultative process and structure for developing PNG Climate Change Policy (Policy No. .../09). This entails assessing alternative policy options leading to formulating a draft policy, with assistance from international agencies and certain domestic institutions and individuals. It is unknown the extent to which persons or organisations named in the Policy Decision have been consulted with respect to their proposed participation (e.g. in respective advisory committees) and other inputs into the proposed process. The intention is to have a draft climate change plan by the end of October 2009. The OCC&ES appears to play a supportive, rather than central role in this policy formulation process.

Various policy drafts have been prepared for OCC&ES and for PNGFA. The intention appears to entail using outside technical assistance to consolidate this accumulated material into a consistent policy and plan of securing international funding support. This the draft policy/plan submitted would be subject to a vetting process with domestic and international stakeholder groups, starting in April 2000. After the consultative process it is intended to submit a draft policy for approval by Cabinet, together with drafting instructions for potential legislation which might be deemed necessary to govern this interim structure.

Uncertainty over carbon policy in PNG and prevailing conservation powers and issues

As yet, despite several aborted efforts undertaken under different Ministries over several years, there remains no national framework for climate change and carbon trading in PNG. Moreover, there is no climate change or carbon trading policy or legislation and the roles and responsibilities of various government departments and agencies have yet to be clarified. The process of consultation and clarification may be resolved imminently, but such impressions have prevailed periodically all this decade. A climate change policy is due for submission to Cabinet by October 2009, in advance of the Copenhagen Climate Change Conference in December, but the scope and legal basis of this is likely to be contested or queried.

Despite the ambit claims of OCC&ES, several other agencies will have key roles to play in climate change and carbon trading, namely: -PNG Forest Authority, Departments of Environment and Conservation, Lands, Agriculture & Livestock, Commerce & Industry, Transport, Planning and Monitoring and Petroleum and Energy

In part, the R-PIN and UN–AusAID roadmap specifies a range of initial stakeholders with whom OCC&ES should work:

1. The following institutions are responsible for forest monitoring and inventories:

- PNG Forest Authority (PNGFA)
- Forestry Research Institute (FRI) – (part of PNGFA)
- University of Papua New Guinea – notably through the UPNG Remote Sensing Centre
- Department of Environment and Conservation (DEC)

2. In the area of forest law enforcement, the PNGFA is responsible for implementing the *Forestry Act* 1991. This Act is responsible for the management of the National Forest Development Guidelines, utilising a National Forest Plan which underpins all forest based activities, although currently long obsolete. The PNGFA is the only legally mandated body empowered to manage timber rights, including the carbon contained therein, on a contractual basis (i.e. though an FMA) where they have obtained the consent of the landowners. Addressing the high rate of deforestation and forest degradation, prevalent over the past 20 years or so, are the main means whereby PNG can contribute to addressing climate change.

3. PNGFA and DEC (with Provinces) are responsible for forestry and forest conservation. The *Forestry Act*, requires the Forest Authority to “pursue the following objectives:–

- (a) the management, development and protection of the Nation’s forest resources and environment in such a way as to conserve and renew them as an asset for succeeding generations;
- (b) the maximization of Papua New Guinea participation in the wise use and development of the forest resources as a renewable asset;
- (c) the utilization of the Nation’s forest resources to achieve economic growth, employment creation and industrial and increased “down-stream” processing of the forest resources;
- (d) the encouragement of scientific study and research into forest resources so as to contribute towards a sound ecological balance, consistent with the National development objectives;
- (e) the increased acquisition and dissemination of skills, knowledge and information in forestry through education and training;
- (f) the pursuit of effective strategies, including improved administrative and legal machinery, for managing forest resources and the management of National, provincial and local interests.

The Act is not, therefore, simply about resource acquisition and allocation for extractive logging, as some members of the public and PNGFA staff believe, although that has in practice been its preoccupying focus over the years. Forest Management Agreements are not forest harvesting agreements and can equally be applied to the management and protection of carbon or diversity, if that’s government policy and the desire of the local community, or can entail a diversity of land-use activity.

DEC is responsible for the creation of protected areas (34 designated in 2002), comprising, Wildlife Management Areas – WMAs - [under the *Fauna (Protection and Control) Act*], National Parks, reserves and sanctuaries under the *National Parks Act*, and Conservation Areas under the *Conservation Areas Act*. PNG has no substantial, nor effective network of protected areas. The National Parks cover a pittance of State land in a few locations, in some cases without any

supervisory staff. There are no declared Conservation Areas, despite innovative legislation passed in 1978. That leaves only WMAs which in reality merely provide protection for selected resident wildlife, in accordance with rules, or by-laws, determined by the resource owners and approved by the Minister. Although WMAs are properly designated, mapped and gazetted, the legislation provides no effective legal protection for the habitat or flora, including trees, except in so far as the other development agencies, like PNGFA and Mining and Petroleum decide to give it some credence. The resource owners may also readily withdraw their areas from this WMA status, for example if other economic opportunities materialise over that land portion. PNG's protected areas range in size from just over 600,000 ha in Tonda (comprising non-forested, seasonally flooded savannah country), to the country's largest forested WMA (Crater Mountain) at 269,000 ha (with 255, 300ha under forest), followed by Hunstein WMA in E Sepik at 219,900 ha (160,800 forested). After that the areas drop to 28,300 ha (23,000 ha forested) at Kamiali WMA (Morobe), working down to small WMAs and National Parks with below 1,000 ha of forest (including Varirata NP, Mt Gaivahasuka Prov. Park 154 ha of forest, etc).

4. there is limited coordination between different land uses, although DEC developed a Management Arrangements and Strategy Development Framework for the Millennium Development Goal 7 and REDD Policy Initiatives, approved by NEC in 2007.

6. Unanswered questions surrounding carbon trading policy issues

There are many issues, many having already arisen, needing to be addressed in PNG's upcoming climate change and carbon policy and legislation.

1. Who owns the carbon resource? Under PNG law (following UK precedent) mineral and hydrocarbon resources are owned by the State; will carbon be regarded as a mineral resource (especially the below ground component) or will ownership of the trees guarantee ownership of the carbon? Some government advisers, including apparently OCC&ES appear to see the State holding some rights over carbon, to license transactions or perhaps even sell carbon rights themselves, paying merely some consideration to the resource owners. The Constitution and Forestry Act clearly specify that the trees belong to the landowners, and therefore by implication the carbon contained therein also belongs to them to manage as they will, subject to some rules which may be imposed by the State for different policy reasons, including GHG emission reduction. Seeking to transfer ownership of the carbon itself from landowners to the State would be fraught with legal difficulty, and subject to legal challenge on the basis of unjust deprivation of property rights. The mechanism for transferring timber rights already exists under the *Forestry Act*, without need for any legislative change. It entails a contractual agreement (comprising an FMA) between two consenting parties, namely the resource owners and the PNGFA, subject to specified arrangements. An existing FMA, and its associated benefits stream for resource owners, could not be utilised for new carbon trading arrangements, unless the original FMA was sufficiently broad in its wording (which is unlikely) or unless it was renegotiated between the landowners and PNGFA. If the *Forestry Act* were used for carbon trading the process must be much more rigorous and transparent, and less subject to manipulation than has occurred with forestry.

2. What trade rules apply? The Government may apply trade taxes, levies and licenses, as it does for some commodities, notably log exports. Other agricultural exports are no longer subject to export taxes, but still attract research, extension, and management levies to fund relevant research, inspection, quarantine and other support and supervisory services. Will this be the case for carbon, will it be treated in a similar way to timber exports? Indeed, nothing is truly exported if the carbon remains in the forests, so the tax would (including standard 10% GST) would be

upon the service payments. Financial services largely do not attract taxation, whilst tariffs on most imports have been reduced to lower, minimal or zero levels, in keeping with PNG's commitment to WTO and other international trade agreements, e.g. EPAs, APEC and Pacific Regional Trade agreements.

3. What agency has authority over carbon? While OCC&ES is claiming sole responsibility for carbon trading, it currently has no powers. PNGFA is responsible for forest management and timber exports, and forests carbon sequestration is considered PNG's main contribution to GHG mitigation. How will this overlap be addressed? If OCC&ES sought to extend a stated or proposed regulatory control to claiming some legal title over the resource itself this would be contested undoubtedly by resource owners,?

4. Can carbon be developed under FMAs? The answer at the moment is clearly yes. An FMA does allow for generic forest management, so it would be possible for carbon projects to be undertaken under future FMAs, and existing FMAs either if the contractual agreement is sufficiently open and all embracing, or there is an agreed variation to the FMA, including over the benefits stream to landowners from carbon payments; forest carbon projects, therefore, would logically be the responsibility of PNGFA. However, the systems of forest planning do not sit within a wider framework of integrated land use planning, partly as a result of the National Forest Service's focus to date on acquiring, allocating and overseeing the management of forestry resources for log harvesting, rather than the wider range of responsibilities specified under their objectives in the *Forestry Act*. As such, it may be difficult to accommodate consideration of other potential uses, unless there is a clear requirement to apply the Development Options Study more rigorously and incorporate more active and serious processes for forestry resource planning and management, including preparation of Environmental Plans, which should no longer simply be the responsibility of a designated forest developer.

5. How will logging FMAs be degazetted, who will be responsible? Should carbon projects require the removal of Timber Permits, how will the Government deal with this? As stated above, PNGFA is the relevant agency and the removal/re-evaluation of FMAs/TPs is critical for the initial REDD projects.

6. What rights will Timber Permit holders, operating on FMAs have? The Executive Director of OCC&ES has claimed that if a community decided to forgo logging for carbon, the resource rights will revert to the landowners, who can then undertake new agreements for carbon. However, the timber companies who have the rights under their Timber Permit may be entitled to challenge or claim redress, including in the form of compensation. It seems unlikely that logging companies will simply acquiesce to give up FMAs, although if Government/PNGFA was prepared to be tough it could readily provide notice to show cause on many projects for failure to perform their required obligations under existing permits/ timber authorities/ environmental plans/ agreement and compliance with regulations, such as the Forestry Code of Practice. Past experience with application of these requirements by the PNGFA (and other Departments) has shown a severe lack of resilience on the part of the authorities in the face of strong direct and indirect pressure (of various kinds) on the part of the operating companies, including at the political level.

Invariably logging companies will claim to be part of the solution, ready to continue harvesting the resource at a lower intensity, whilst receiving carbon payments in lieu of forfeited income from sale of logs. These are clearly issues which need addressing, but logging companies should not be compensated for lower harvesting rates on projects where they are already non-compliant, and were required to operate on a deemed 35 years cycle already. With many existing

concessions already having reached the end of their permit, it is critical that all logging extensions and prospective new permits are frozen and unallocated FMAs and prospective FMAs retained for potential carbon retention. Special consideration should also be given to major existing protected areas, none of which enjoy tangible legal protection from being deforested or degraded by forestry or agricultural extension, except in particularly inaccessible or difficult terrain.

7. What will be the role of government agencies in developing a national baseline? It seems clear that specialist agencies must be responsible for carbon accounting of individual sectors; how will this be coordinated; through OCC&ES? Auditing would need to be plausible and independent.

8. How will leakage be addressed? Following on from the above point, sectors with high carbon emissions (mining, transport, forestry and some agriculture, etc.) should be required to perform annual accounting – who will determine how or if penalties offsets etc. will be applied – is this OCC&ES's role? As things stand only the *Environment Act* (which also covers contaminants etc) can account for all land-use changes, so should this role sit with DEC, or perhaps under the new EPA Office?

9. What authority will OCC&ES have over private carbon projects? Given that many landowners have already signed contracts and MOUs with project developers with a view to selling voluntary credits, can OCC&ES intervene in these projects – if so on what grounds? Moreover, if private contracts offer better deals than State projects, how can resource owners be compelled to forgo these benefits?

7. Current REDD project activities and actors in PNG

As alluded to above, the roles and responsibilities for carbon trading and REDD project development remain unclear in the absence of policy and legislation. Nevertheless, a number of stakeholders are already very active in developing potential carbon projects (mostly over the past year, but in a few cases since the early 2000s) in the belief that policy will follow soon. These stakeholders include government departments and institutions, private developers and corporates, NGOs and forest landowners.

Government Actors:

Office of Climate Change and Environmental Sustainability (OCC&ES) has registered three companies for carbon trading and shortlisted two others, these are overseas-based and PNG private developers. The basis of selection leaves concern, and clearly with the high level of malpractice apparent over the use of public funds and assets (as highlighted by the Parliamentary Public Accounts Committee, various recent Commissions of Inquiry, e.g. into the Finance Department, and current Ombudsman Commission inquiries, e.g. into forestry payments to politicians purportedly held offshore) the wider public in PNG, official watchdogs and international donor and potential carbon trading partners have justification in being concerned and needing to see fair, transparent and competitive arrangements. The independent reviewing and licensing arrangements of certain Statutory organisations, like the Independent Consumer and Competition Corporation (ICCC), even when under strong duress from Government over mobile phone licensing) may provide some role model.

OCC&ES has listed several sites as initial pilots for REDD with the UNFCCC; these include Kamula Doso (790,000 ha FMA in Western Province) – currently under court injunction preventing logging, and particularly after a recent landmark case against the company claiming to hold the Timber Permit (extension) but, as deemed by the Supreme Court, following

misrepresentation – and the Hunstein Range (WMA) in East Sepik. No project development has been undertaken, but landowners have already liaised with several project developers as well as OCC&ES. However, after recent moves with the UN-AusAID roadmap, it appears that OCC&ES may liaise with PNGFA to have the latter agency undertake the pilot site identification – the situation remains unclear.

The Department of Environment and Conservation (DEC) has been authorised by the National Parliament to develop a REDD scheme in the Kokoda Track project area – this looks set to be developed to best practice with input from international experts and experienced NGOs such as WWF and TNC.

PNG Forest Authority has developed a Climate Change Framework for Action for 2008 – 2015. These programs identify a range of agency responsibilities on Climate Change and REDD:

1. Implementing adaptation measures
2. Contributing to migration of greenhouse gas emissions
3. Improving decision making and good governance
4. Improving the understanding of forestry and climate change
5. Education and awareness
6. Partnership and cooperation

PNGFA is also looking to develop four pilots REDD projects around the country, however, as yet these remain undeveloped. Two possible sites, Kapuluk TRP in West New Britain has been identified, Crater Mountain WMA and prospectively a site in Momase and the Southern region, but there has been no final selection of sites and no landowner engagement, except through some engagement with NGOs and exploratory dialogue with some prospective carbon trading partners.

Others: most other Government institutions have a role and responsibility related to Climate Change, but some also with respect to carbon trading, from Treasury and National Planning (with respect to policy and programme), to the Investment Promotion Authority and Commerce, Foreign Affairs and Trade, notably in relation to tariffs and trade, Agriculture and Livestock and particularly the Provincial and other sub-national governments, notably with respect to powers under the Organic Law, and prospective service provision. The National Agriculture Research Institute, NARI, has been undertaking analysis in its Chemistry Laboratory for many years into rates of carbon absorption by different plants in PNG conditions, including forestry and tree crop species, like rubber, oil palm etc.

Private Developers:

Several carbon project developers have already signed agreements with landowning communities to develop REDD projects on large areas of forest. These areas cover about 3 million ha, largely existing or potential FMAs. However, the validity of these agreements remains unclear given the absence of nation carbon trading policy, but considering that the resource does belong to the landowners and there is currently no law in place preventing them reaching agreements over this resource, where due process and consent has genuinely be granted by the landowners (and there are no prior agreements committing the resource, as under an FMA with the PNGFA), then the agreements undoubtedly have some legal validity. Developers claim that pre-trading of credits could be possible within months, if policy enabling conditions and government legislation can be delivered. The quality of project proposals range from well constructed project designs with legally binding contracts, to non binding MOUs. There are also a range of generic agreements, which appear to be little more than attempts to act as middle men to sort landowners – these agreements are considered to have no legal standing (see Appendix X) and highlight the need for

the fast tracking of national policy and standards. The OCC&ES's statement that no project agreements in PNG should be valid after 2011, adds uncertainty to long term carbon commitments.

Corporates:

At least two international merchant (investment) banks have been seeking to enter into MOUs with landowners and NGOs to implement 'feasibility studies' of prospective REDD sites. At least three areas around PNG have had offers. The scope of these agreements has not been made clear and the obligations attached to them are uncertain, but exclusivity has been expected under similar agreements in Indonesia. Presumably, these MOUs are aimed at establishing first call on projects over other project developers.

Non-Governmental Organisations:

NGOs are well placed to work in the PNG REDD environment. They include non-aligned international organisations with a long history of working with local stakeholders and government actors. Moreover, international NGOs, such as WWF, *The Nature Conservancy*, and *Conservation International*, *Wildlife Conservation Society*, and some larger National NGOs, like *FPCD*, *Research and Conservation Foundation of PNG* and *Village Development Trust* offer considerable opportunities for dialogue with key foreign governments and sectors (on which the PNG Government has placed hope of securing carbon funding). There are also recognised, established financial vehicles in place for handling conservation funding (through an endowment arrangement), which could be utilised in some way, such as the *PNG Mama Graun Conservation Trust Fund*.

Perhaps the most important role for NGOs is the introduction and implementation of standards and awareness. Unlike the logging market, where PNG has largely ignored or paid lip service to standards, this will not be possible for carbon. Already WWF and TNC are applying pressure that all projects be developed to VCS and/or CCBA. There is also interest from agencies such as DEC and some private developers to adopt an adaptation of the WWF *Gold Standard*, arguably the best regarded CBD compliance standard; WWF are currently looking to develop a *Green Gold Standard*, which could be applied to projects within PNG.

The PNG Eco-Forestry Forum (EFF), which comprises a membership by other eco-forestry and conservation NGOs in PNG, released a position paper on REDD (Appendix X), focused on equitable financing and benefits flow to forest owning communities. These demands would be met by international carbon standards. EFF has stipulated that all current and proposed industrial logging rights should be cancelled before introducing any carbon financing scheme in PNG; however, it seems unavoidable that some carbon payments must be introduced before all logging could be cancelled if REDD pilots are to be successful. The EFF has been liaising with the *Community Carbon Forest (CCF)* Project, working with local NGOs through eco-forestry projects undertaking a feasibility study of community carbon projects in New Britain (some already holding FSC certification).

WWF has perhaps been the most active early mover on REDD projects amongst the international NGOs in PNG. It has been liaising with all sectors, mainly with a view to standards development, sustainable management and payment plans. Currently WWF is partnering private developers in numerous proposed projects covering up to 2 million ha of forest landscapes. WWF is also contacting many landowning groups, including the PNG Carbon Trader's Association (see below), and has launched a radio awareness programme for landowners throughout PNG, in

association with OCC&ES. However, by its own admission, WWF concedes that REDD is a shifting feast in PNG and the overarching aim is for better land-use planning towards a nation carbon baseline.

The Nature Conservancy (TNC) has REDD expertise around the world (including the development of the ground-breaking REDD project from early 2000 in Bolivia), but has no active REDD projects in PNG, instead focusing on Indonesia regionally. However, TNC and WWF are looking to work with DEC to help develop a pilot REDD project to world's best practice in the Owen Stanley Ranges.

The Clinton Foundation has identified Crater Mountain FMA as a possible REDD pilot site and have liaised with RCF and the Government and is seeking NORAD funding. The Clinton Foundation already has a REDD pilot site operating in Cambodia and looking to develop similar projects in PNG and Indonesia.

Greenpeace is campaigning hard for REDD to be seen as a viable alternative to industrial logging through its favoured TDERM approach. They have produced a booklet promoting the carbon values of PNG's forests and continue to lobby against unsustainable logging. They are not known to be involved directly in any REDD sites in PNG, although currently advocating a "Forest Fund" to support sustainable forest activities in Western Province; this may have some carbon element.

Conservation International (CI) is looking to develop a REDD project on the Huon Peninsula (60,000 ha) in Morobe with backing from a European corporate investor; however, as this area was recently declared a Conservation Area its eligibility may be questionable, although (as stated) conservation areas under most PNG legislation are tenuous and may not prevent infringement by logging, mining or other developers.

Research and Conservation Foundation of PNG supported the landowners in the establishment of the large 269,000 ha WMA in 1991 (the largest forested 'protected' area in PNG), and its subsequent management and provision of certain local infrastructure and services. CMWMA spans an extensive portion of EHP, Simbu and Gulf provinces, including some 255,000 ha of rainforest. However, the southern portion of the WMA, particularly, is constantly threatened by various industrial developments, including an extensive current FMA. A carbon trading scheme has long been under negotiation with resource owners in one portion of the WMA and certain international bodies, with support from the PNGFA, focussed particularly upon the provision of sustainable improved infrastructure and services, rather than cash payments.

Forest Resource Owners:

A growing number of landowners are joining the seminal **PNG Carbon Traders Association** (PNGCTA). This Association aims to represent member interests and provide a forum from which members can seek advice, as to credible project developers and lobby Government for best practice and landowner benefits. As of writing, PNGCTA contains members representing landowners, from about 30 forest concession areas covering all parts of PNG – this represents a considerable proportion of REDD eligible forest in PNG. Members of PNGCTA have already opted out of unfair MOUs in favour of better deals. PNGCTA has been dealing with some project developers, OCC&ES and seeking advice and support from WWF. The evolution of this group will be interesting as there is a risk it could develop into a group of landowner middlemen and/or agents.

8. Application of economic valuations of tropical forest benefits, costs and deforestation in PNG....

Papua New Guinea's economy is heavily dependent on subsistence production (including agriculture and fisheries) and primary commodity export. These include plantation crops, forest products, and minerals. PNG's economy is highly dualistic. It is composed of an informal sector that supports the majority of the population through subsistence agriculture and smallholder cash cropping, and a formal sector in the towns and local mining/oil enclaves that generates comparatively high incomes.

Agriculture forms a critical component of private sector activity, providing income, employment, and livelihood to some 85% of PNG's population and contributing 28% of its GDP, 40% of export revenues, and about 40% of formal private sector employment from 1984 to 1998. Overall, an average of some 36% of the gross domestic product (GDP) was derived from agriculture, forestry, and fishing during 2002-present, (somewhat lower during recent years of high mineral and oil prices, but likely to be higher over the next few years); and 23% from mining, oil, manufacturing and construction. The comparative importance of the agriculture sector is greater measured in GNI (i.e. comprising benefits largely retained within PNG).

However, mineral deposits, including oil, copper, and gold, account for an average of 72% of export earnings this decade, progressively rising to 88% in 2006, but slipping back in 2008, and forecast to fall to 74% for 2009 (lower copper and oil prices, particularly). Agriculture, forestry and fisheries exports slid to 15% in 2006, but forecast to be back to 26% in 2009 with mineral commodity prices falling (to date) more severely than agricultural. The domination of export earnings looks set to increase dramatically in the next few years, despite the prospective closure of some current mines, owing to the prospect of a major (Exxon-led) LNG project due to commence production in 2013 (plus other possible LNG developments). The Exxon-led project will not however double the country's GDP as suggested in a recent ACIL-Tasman report, and its impact will be significantly less in terms of GNI. Prior to and during the construction phase the project is liable to have a severe wrenching effect upon the entire economy, and potentially severely impact some other industries, including agriculture and other rural industries, negatively affected by 'Dutch Disease' inflationary pressures, currency appreciation, skills shortages, etc. During the current global financial and economic crisis, however, the project(s) is by no means a certainty, although some of the raised expectations and inflationary effects are already being felt.

PNG has been partially sanitised from the financial and economic crisis, with gold prices and exports remaining firm and some agricultural commodity prices falling less severely than minerals. The strong earnings and revenue have bolstered foreign exchange reserves, bank liquidity and allowed government to retain large 'windfall revenues' in reserve for the future or until capacity to implement has improved. However there are now worrying signs that, particularly with the prospects of LNG, Government is weakening fiscal control, not fully appreciating that the country's foreign exchange reserves are already declining steadily. The prospects for the economy and achieving the Government's MTDS priorities depend very much upon continued fiscal and monetary stability, which could be readily jeopardised, also undermining the country's ratings and prospects for the LNG to proceed within its envisaged market slot (from 2013) ahead of other proposed LNG supplies from the region.

The forestry industry contributes just below 5% of exports. It reached 18.6% in 1994 after prices leapt in 1993 and several new projects approved in early 1992, after the new Forest policy and Act had been passed, but before they were applied, and before log export tax rates (and royalties) were raised and independent export monitoring applied, but subsequent less buoyant prices, and

the higher tax rates and monitoring, and the growth in other sectors have reduced the share. As of February 2009, the global recession has seen a further decrease in demand for timber as part of the general commodities market decline, but it seems likely that in the long-term, there will be market demand for PNG tropical hardwoods, even though temperate softwoods have become more predominant. Restrictions may be applied increasingly, at least in developed country markets, upon sourcing timber to sustainably certified production, possibly paying some premium for this product. Pressure to meet these requirements remains weaker in the major East Asian markets where most PNG logs are exported.

According to Shearman et al. (2008), from 1972-2002, 3.8 million ha of PNG's forests were degraded or cleared by logging operations, with a total declared value of exported logs was K4.57 billion, which equates to a value of K2,262 ha⁻¹ of logged forest.

In 2006, 2.65 million m³ of round-logs were exported with a declared value of K491 million (€128 million). In addition, there were exports of sawn timber, veneer, plywood and wood chips worth K70 million (€17 million). The sector contributed about K100 million per annum in the 2000s (€24 million) to government revenues annually (K155.5 million payable in 2007, and 120.2 million to November 2008 - SGS), principally through a tax revenue on log exports; about 2.7% PNG's annual tax revenue, or 2.5% of Total Government revenue for 2007. It is estimated the industry employs between 7,500 people and 10,650 people (Shearman and RH). Returns to landowners are PGK 10 m³ (a rate set in 1996); this equates to about 5% of the value of the exported logs. Recently the PNG government tripled this to 30 kina/m³ in response to landowner concerns of poor returns. Logs processed in veneer or other products are no longer subject to export tax and effectively forego levies, resulting in very limited benefit to the State and resource owners where such industrial processing occurs. (Likewise certain species prohibited for export in unprocessed form have been exported without any export tax being applied). Major variations in log export prices are being specified by logging companies, for the same species and grades and significant transfer pricing is assumed, even since the mid-1990s when SGS monitoring proceeded, with little action being taken by respective authorities (Customs, PNGFA, and formerly Dept. of Commerce).

The contribution of forestry to the economy at the provincial/ District levels in PNG has not been formally quantified, but, unlike under the former revenue system, there is little or no direct income to sub-national authorities. However, logging companies are required to provide infrastructure and social services (and in some cases Project Development Levies) according to the specific conditions of each timber resource permit and approved plans. This includes roads, airfields, air services and health and education facilities, and the alleged failure of many companies to honour these commitments continues to be an ongoing source of contention.

Oil Palm has been the cash crop showing the greatest growth PNG and is now the major agricultural export earner, directly supporting about 20,000 small-holder families and three large companies and bringing in increasing export earnings (approx. K800 million in 2008 or €18 million, rising from K672 million in 2007). It benefits from the relatively organised nature of the nucleus estates, most also supporting extensive outgrowers. In terms of the number of beneficiaries, however, oil palm remains well behind coffee, which like most other major cash crops, is now largely smallholder-based, with nearly half PNG's households as coffee producers, largely with very low crop output and income.

Table 6: Exports of palm oil from Papua New Guinea, 1990-2007.

<i>Year</i>	<i>Value (million kina)</i>	<i>Volume ('000 tonnes)</i>
1990	32.7	142.7

1995	142.2	186.6
2000	306.6	336.3
2005	391.4	295.2
2006	430.1	362.3
2007	672.2	368.3
2008 (3 qtrs)	776.5	325.7

Source: Bank of PNG. (Note this only entails the exports of CPO and would increase by approx. K200 million if refined palm oil, processed in-country since 2003, is added)

Mine wastes and tailings

The construction of large-scale mining operations and associated infrastructure may involve some clearance of native forest. The Ok Tedi mine, which began operating in 1984, has had a major impact on its floodplain habitats and ecosystems (WRM 2005, 2006), particularly in the absence of any tailings dam, following the failure of its initial dam. It is now estimated that forest dieback as a result of overbank flooding may eventually affect an area of 300,000 ha in the lower Ok Tedi and middle Fly floodplains, all of which will be converted into swamplands (Pickup 2005, Tingay 2006). As the layer of waste rock on the river bed is pushed further down river over coming decades, there will eventually be some additional impact on the floodplains, which means that the area converted from forest to swamplands could be three times greater than the whole of the area already planted to oil palm in other parts of the country. The impact of other mines in PNG on the terrestrial environment has been more localised, whilst the oil fields operated by Oil Search (and hitherto Chevron) in Southern Highlands province have been fairly exemplary in terms of direct environmental impact, whilst also supporting extensive conservation efforts (including through WWF) since the field's development.

9. Identification of underlying policy price and market instruments influencing profitability of resource uses of forest land – income estimates.

Relative profitability and benefits of carbon versus other land-uses

The advent of REDD and other payments for environmental service schemes (PES) has opened the opportunity for a re-evaluation of the relative value of forest resources in PNG. The chance of reducing forest loss by using carbon projects to compete against the major drivers of forest change (logging, subsistence agriculture, oil palm and mining) have varying potential for success. These issues are addressed in increasing order of potential to be reduced by REDD.

Mining

Mining, oil and gas dominate PNG's export and tax earnings – compared with this sector logging is relatively unimportant to the economy, particularly in recent years. Oil and gas have, furthermore, relatively little direct effect on forest change (although road access can lead to degradation), and while mining has affected up to 150,000 ha of forests (from one project), this is less than 2% the area affected by logging. In short (the industries' own emissions apart) the economic cost of sacrificing mining, oil and gas to preserve forest makes little economic sense in PNG. Indeed the mining sector could become a domestic customer for newly emerging markets for forest offsets for carbon and biodiversity. In addition, corporate social responsibility could make local projects in PNG even more attractive for international companies operating in the country.

Oil Palm

Landowner earnings vary between projects, but those renting land to the largest company New Britain Palm Oil Ltd. (NBPOL) have a payment scheme based upon area planted, length of contract and fresh fruit bunch price (FFB). They are paid an annual rent of K50 ha⁻¹, and a 10% royalty of the FFB. In addition, growers are given NBPOL shares, 25 shares ha⁻¹ for a 22 year lease and 50 shares ha⁻¹ for a 44 year lease. The average yield is 23 tonnes ha⁻¹ and FFB is K125 tonne, with a share price of about K10 (i.e. Feb 09 –when the share prices are generally low); this delivers a landowner return of K7,414 per ha⁻¹ and K15,328 ha⁻¹ for a 22 or 44 year lease, respectively. (Many landowners may also have smallholder oil palm blocks, from which they also gain regular income).

In terms of socioeconomic benefits, palm oil is better than logging, especially with moves to regulate the industry including the adoption of RSPO standards by the largest palm oil producing company (NBPOL) in PNG, and with the other two companies (Hargy Oil Palm and CPT, which operates in 3 provinces) also committing themselves. NBPOL has made successful use of the tax credit arrangements whereby an allowance of 0.75% of the company's taxable revenue can be spent on public infrastructure maintenance and construction. A total of K2.2 million kina was spent on tax credit projects in the year 2005. In addition, the company has continued, at its own expense, to undertake road maintenance to allow continued access to villages and settlements. Using 2007 figures, palm oil delivered K672 million in export earnings compared with K631 million from forest products. Palm oil earnings for 2008 are projected at approx K800 million and log exports down to about K477 million (total forest products approx. K530 mill). However, oil palm plantations cover less than 3% of the area affected by logging, and benefits are largely retained within the country. Oil palm remains controversial, however, since it results in deforestation and landscape transformation, is a monocrop targeted at the richest soils, which also harbour some of the best rainforests. Forestry causes more extensive damage, but in theory should provide income-earning, employment opportunities and some rural services to some of the most remote communities in PNG, although in practice the local benefits and standards of infrastructure and services fall far below satisfactory levels, with some Timber Permit holders particularly; (carbon sequestration by oil palm is also sound).

Subsistence agriculture

Despite being one of the largest drivers of forest loss and degradation, in terms of possible carbon value or forest protection, the potential of reducing subsistence agriculture is limited. Clearly these activities are essential and the population has been growing steadily at an estimated annual rate of 2.7%; agriculture provides a subsistence livelihood and small cash incomes for 85% of the population – either through the subsistence production of food and/or for the supplementary production of food and cash crops for export and sale at local markets, (from tree crops, notably coffee, cocoa and copra for export, as well as betel nut and fruit and vegetables for the domestic market). Moreover, this food production represents much greater ecological sustainability and lower carbon footprints than industrialised agriculture. There are some, partly definitional problems related to assess the rate of forest degradation and deforestation on the forest fringes with settlements, but whether defined as forest or garden land, it has been widely reported that the forest biomass in these “forests” is steadily declining as usage for different purposes intensifies. It should be noted, however, that some efforts are underway to investigate new farming practices, such as permaculture to reduce forest clearing for gardens to perhaps value add to REDD programmes for rural communities, but PNG and international experience usually shows that various techniques are used, including use of composting, as population pressure grows, as traditional fallow periods are forced to shorten (Bourke et al, 2009).

Logging

Because of the relatively low income per area (from industrial forestry) and lack of perceived benefits to the forest communities, the carbon offset industry is concentrating on the 5.8 million ha of production forest under threat from logging. However, the current problem with any attempt to undertake a cost benefit analysis of carbon is that there are huge variations in the calculations depending upon buffering, degree of degradation, assumptions of eligibility and so forth.

In order to promote forest conservation, Greenpeace recently released a report that estimated the potential carbon liability of one of PNG's largest logging concessions, Wawoi Guavi, to be 127 MtCO₂, worth an estimated €1.3 to €3.8 billion. This analysis claims that the loss of carbon – valued at between €7 to €253 million yr⁻¹ of operation – is well above the landowner, government and public benefit that comes from all logging conducted in PNG. For this analysis Greenpeace estimated forest carbon at 125 tonnes C ha⁻¹, of which 50 % was released – the value of carbon was given as €10 tonne, or €2250 ha⁻¹ (it is understood that the current carbon price on the voluntary market is less than half this figure, but this is depressed by the current financial crisis and lack of certainty over the prospects of the mandatory market, post 2012).

By comparison WWF has recently launched an awareness campaign for landowners and forest communities in PNG in which the carbon estimates are much more conservative; assuming 150 tonnes C ha⁻¹, of which 20% is released, with an average price of €1.2 tonne on the voluntary market (the bottom end of voluntary prices), giving a value of €30 ha⁻¹. These differences reflect different audiences: Greenpeace is attempting to show that carbon values outweigh forestry, whilst WWF by comparison is showing landowners some possible real earnings in the field, low-balling figures to try and remove unrealistic expectations and account for invariable sources of leakage and eligibility across landowner forest areas.

The most optimistic valuation by a carbon trader quoted the value of 100,000 ha⁻¹ project area (from approximately 10,000 ha⁻¹ was eligible for REDD after constraints mapping) as US\$80 mill over 20 years (US\$4 mill yr⁻¹) or US\$400/ha.

Estimates of per hectare values for various forest uses in PNG

	Total Value	Landowner return ^{\$}	Govt. revenue ⁺	Project life	Comments
REDD: WWF (conservative)	€130	€65	€39	20-30 years	Lowball figure assuming low end degradation and carbon price of €1.2 tonne
REDD: Project developer	€7,800	€3,900	€2340	20-30 years	Claims to be market for VCS certified at current premium prices
REDD: Greenpeace	€2,250	€1,125	€675	TBA	Assumes high eligibility and carbon price of €10 tonne
Oil Palm	€18,950	€2,221	€3790	22 years	Assumes FFB €34 tonne

Timber	€1,500	€225	€465	35 years*	Assumes 25 m ³ ha ⁻¹ and the new 300% increase in royalty payments
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§ REDD figures are based on the 50% return as per OCC&ES

+ For carbon this is assumed at the 30% tax currently advocated by OCC&ES.

* After the 35 year rotation period, second rotation harvests would be much lower and perhaps uneconomic.

Proposed REDD payment schemes

As can best be determined, there are three payments schemes currently being canvassed in PNG:

1. A private project developer is offering 80% gross return to landowners of credits sold: the project developer takes 10% and 10% cap on costs, including project certification. OCC&ES had agreed to tax this at 7.5%, but their mandate for making this decision does not exist at this stage.

2. A second (more commercial) project developer has been offering 40% to landowners, AFTER costs and other expenses. What the cost and expenses may be is not detailed, but clearly this is a deal from which landowners have been trying to extricate themselves, or ensure competition forces improved offers; it looks likely the developer would need to revise this, particularly in light of OCC&ES's latest payment proposal

3. The latest OCC&ES model calls for a 50% tax free component to landowners; 30% to Government; 10% to the DNA; and 10% to the project developer. This seems an unreasonably large cut for the State, considering the limited costs incurred by them and the fact that they are depriving rural communities which have long had limited or no services from government. Export tree crop producers do not have to have to pay any significant cut (in the form of taxes and levies to the State) except in the form of modest levies for research and extension services provided by respective commodity organisations. Levies should be tied to direct services to the communities themselves and some running costs for OCC&ES (or the PNGFA which legally can be running these arrangements under current FMAs), and should not be servicing extravagant costs of a large NCD-based bureaucracy or the overheads of multiple boards. Administrative overheads by the State should be kept to a minimum.

Is REDD viable in PNG?

Clearly, if the optimistic carbon valuations are correct, the benefits of moving from timber to carbon are manifest; the value of carbon far outweighs that of timber, even without adjustment for environmental damage, plant and equipment, possible future carbon footprints, etc.

However, even if the low end figures are accepted, there remains a good deal of interest in carbon from different stakeholders for a number of reasons:

Benefits for landowners

Actual returns

For landowners the total value of the resource is irrelevant, what they want to know is how much they will receive (in cash or provision of infrastructure services) through their nominated/agreed local service provider; at present most of the value is exported and/or taken by government. Moreover, the stated returns from log levies are rarely paid in a timely and uncontested manner,

so even if carbon values were lower, if regular and reliable payments were guaranteed (including potentially partly using direct transfers to all individual households, notably through mobile phone banking) most communities would consider the option.

Services delivery and standards control

A perennial problem with payments to communities for timber resources in PNG has been that payments have been large and short-term; this often results in the squandering or misappropriation of money by nominated, or self-nominated leaders, often (though illegally) receiving the money in the National Capital, rather than onsite within the community, often squandering the royalty payments within the National Capital, sometimes prior to receiving it. In addition, once the timber leaves the area, there is no pressure on the timber company to honour commitments – (i.e. temporary roads and bridges fall into disrepair, vehicles become unusable, buildings, including schools and health centres left derelict and promised benefits are never delivered) By contrast, conservation of the forest for carbon would enable a steady income stream and, moreover, communities would maintain control (and responsibility) of their own resources as the carbon never leaves the land. Transparent payments and clear areas of community spending (i.e. agreed annual portions to schools, health centres, road development and maintenance, etc.) would have to be built into any carbon trading scheme (as agreed with the community), most likely though a trust fund linked to a sustainable development plan. Such a system would be welcomed by most communities, though not necessarily by all leaders, some of whom have been accustomed to receiving disproportionate benefits.

Traditional and ecological conservation values

The quality of environmental services is highly valued by rural communities, though not to the extent that community leaders would necessarily forgo logging projects, when they have had little prior access to cash incomes, or opportunities offered for infrastructure and services (though often not delivered). A great fear that communities often express when anticipating logging is the degradation of water quality and hunting (due to loss of forest and increased hunting by forestry workers). Thus, many communities would also factor these benefits into any decisions regarding the future of their forest resources.

Benefits for the PNG Government

Revenues

If the top end figures are correct, the government will clearly favour carbon over logging, as the tax revenues are higher. The Government's principal concern should not, however, be its own revenue, but also that long term incomes and services are delivered to remote rural communities, long overlooked, consistent with the Government's commitments to the MDGs, as well as wider social and environmental considerations

International commitments

The Government committed to implement the Millennium Development Goals (MDG), with particular emphasis placed on MDG 7 for environmental sustainability. Additionally, the Government re-iterated its commitment to Convention on Biological Diversity (CBD). Clearly the large-scale protection of rainforests through avoided deforestation would greatly enhance both these international commitments.

Tax offsets

Tax Credit schemes are already operating through the mining and oil palm industries. In effect, the industry is obliged to deliver public goods and services considered tax offsets. A similar scheme could be implemented with carbon schemes. Such a system delivered to some of the most remote areas of PNG could therefore be an effective tax offset for the Government – indeed

the sustainable development payments demanded by most international REDD standards would ensure local services were developed.

Social concerns

There is growing disquiet within the country at the perceived undervalued export of timber, and the industry is widely considered corrupt by landowners. The government has some sensitivity to these issues, which are substantially a criticism of its own lack of governance standards; the Government might wish to value-add and exert greater control over the nation's forest resources – there is no love of the foreign logging companies with PNG society, although some leaders and officials have widely been perceived as being too intimate with these companies, as was apparent in the past, and highlighted in the findings of the 1987-89 Forest Inquiry.

Reform of environmental compliance

Timber is becoming relatively less important to PNG's economy. The largest earning sectors are oil, gas and minerals; moreover these sectors are generally expanding. All these industries have potential for the government to develop carbon offset and or biodiversity offset monitoring and compliance (a National Environmental Protection Agency is currently, if protractedly, being established in PNG), and many are agreeing to higher standards for themselves e.g. under RSPO in oil palm and potentially under the Extractive Industries Transparency Initiative (EITI) for mining/hydrocarbons, if the Government accedes to that, and FLEGGT and other mechanisms in forestry. There are already clear indications that major players such as Exxon, Xstrata, Ok Tedi and Oil Search are open to the notion of carbon offset projects in PNG.

Benefits to Provincial governments

At present Provincial Governments get very little from logging; export taxes and levies are paid to national coffers, and no longer partly distributed as hitherto to the provinces responsible for local infrastructure and most services (although the 2008 Organic Law change has improved Provincial financing to worse-off provinces, including Sandaun, with little other industry than forestry). In addition, as stated earlier, there has been a lack of promised socioeconomic development and certainly the sustainability of any logging infrastructure is highly questionable, as most concessions are worked for only short periods of time, or front-end loaded. If Provincial Governments could be freed from responsibility to service areas under REDD, they would probably welcome the opportunity to concentrate resources in other regions.

Benefits to logging companies

There are indications that some logging companies are looking to improve practices with a view to trying to claim carbon credits under reduced impact logging. Such an improvement in practice would be welcomed. Ideally there would be a move away from harvesting primary forest in favour of developing hardwood plantations on degraded areas. However, there are strong concerns that operators with poor compliance records are aiming to secure carbon; this is incompatible with the objectives of REDD. Carbon markets must ensure that that past poor practice, and failure to honour requirements under existing Permits and agreements (including adhering to the Forestry Code of Practice) is not rewarded and that industrial-scale logging of rainforests does not qualify to receive forest-carbon funding. Clearly, this is one issue that would be captured under internationally recognised carbon standards.

Incentive schemes / use of interim funding

Plantations

PNG needs to maintain a timber industry, but rather than harvest primary forest, there should now be a shift to hardwood plantations. These plantations can yield up to an astonishing $400 \text{ m}^3 \text{ ha}^{-1}$ and developed in degraded areas. PNG has very limited forest plantations, but the regional model

is in neighbouring Solomon Islands, where KFPL¹¹ has certification on its plantation production and is supporting some communities with sustainable natural forest management and marketing. Perhaps one way to stimulate a shift to this approach is for a bond or options system in which guaranteed sales are forward traded. Thus plantations can be developed while forest loss is being reduced in favour of carbon.

Oil palm standards/offsets

The move of major oil palm companies to adopt standards is encouraging, but if responsible companies refuse to clear high conservation value forests, accessible areas will inevitably be cleared by landowners or other less reputable companies. Therefore there must be some rewards structure for best-practice. Companies should be able to claim biodiversity or carbon credits, to compensate landowners with payments to maintain their high value areas – some interim fund could stimulate the development of such a scheme. There are already high value biodiversity areas (including some of the remaining areas hosting the rare resident Queen Alexandra Birdwing Butterfly¹²) where new oil palm development is proposed and community members are seeking some of the benefits of development, but have indicated a preference to conserve the forest if other options, notably from carbon trading, were available.

10. Concluding Remarks

The Prince's Rainforest Project (PRP) aims to see how interim funding could help prevent rainforest loss until it is clear whether REDD systems are viable and operating. How this funding may best be used in PNG presents something of a dilemma. It is clear that there is considerable international support, in principle, from governments, international institutions and NGOs to help PNG develop viable REDD schemes and REDD readiness. However, up until now it is institutional and capacity constraints, rather than money per se, which have been the stumbling block. The recent UN-AusAID road map is the latest attempt to try and help the PNG Government to coordinate key agencies to establish a viable system and there is clearly apprehension as to the capacity and integrity of the current OCC&ES setup, and scepticism that PNGFA, having being unable to enforce sustainable logging over the last 30 years, can deliver a credible REDD system within a few years.

Nevertheless, the next 12 months will be crucial. There are the first signs that OCC&ES, PNGFA and DEC may start to coordinate; the establishment of the Advisory Boards above OCC&ES, are an acknowledgment that PNG must seek credible external technical expertise, and the proposed trust fund structure may be further recognition that the old logging payments systems are not internationally credible.

Given the number of communities swamping NGOs and carbon project developers, there is clear resource owner interest in REDD; however, many of landowner groups are misguided into believing they will be receiving huge incomes relatively quickly, for little obligation. There is a very real danger of perverse outcomes, once the early benefits do not flow. Already, WWF, for example, has reported receiving virtual blackmail demands from landowners requesting carbon deals (despite the absence of any requisite policy or legislation), or else the communities will seek logging alternatives. Other NGOs have found communities splitting to access control of potential revenue streams (from different perceived sources). One use of interim funding could be the establishment of some early funding to identify potentially eligible projects and start using this for interim agreements, with some funding for establishing sustainable development plans (or

¹¹ Kolombangara Forest Products Ltd

¹² The world's largest butterfly found only in a limited lowland area in one province

DOS) for these communities and start meeting community development need (water tanks, upgraded clinic, etc.). Even should, REDD not develop, these sorts of benefits are required in any event; the problem will be finding the capacity to deliver them. High current landowner demands for equity and royalties related to prospective LNG projects are also inflating expectations from carbon.

However, before any such interim schemes should be envisaged, international funders need to get some sign of good faith from the PNG Government. It seems inconceivable that interim funding should be made available, while the government is approving a large number of new high impact logging and related development projects; any interim funding should first require a moratorium on these projects pending, first, the implementation of a clear climate change and carbon policy and legislation, and, second, a re-evaluation of how these may effect a nation's carbon baselines.