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On behalf of
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REDUCED IMPACT LOGGING

AND FIJI'S

NATIONAL HARVEST CODE OF PRACTICE

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1. BACKGROUND

The GIZ (Deutsche Gesellschaft fur Internationale Zusammenarbeit) with funding from the International Climate Initiative (ICI) of the German Federal Ministry for the Environment, Nature conservation and Nuclear safety (BMU), has commissioned a consultancy to examine the relationship between the concept of "Reduced Impact Logging" and the Fiji National Code of Harvest Practices (NCOHP). This consultancy falls under the larger imperative of the regional organization *Secretariat of the Pacific Community* (SPC) which seeks to develop and strengthen regional and national policies as well as technical and institutional capacities for the implementation of a REDD+ (Reduced Emissions from Deforestation and Degradation) national strategy.

Recently, there has been a resurgence of interest in the concept of a reduced impact logging (RIL) management strategy largely due to the increasing potential for financial offers now being attached to the protection of forest ecosystem services and the role of forests as carbon sinks and reservoirs. RIL is identified as an intervention under the REDD+ initiative which enhances sustainable forest management and improves carbon retention in the forest ecosystem.

Fiji has in place a revised national code of harvesting practice (NCOHP). This code of harvesting (hereafter referred to simply as the Code) provides the instrument for the implementation of reduced impact logging. However, the Code is just a guideline and currently has no legislative backing to enforce its implementation. For RIL to be implemented effectively, it is considered desirable to develop a legal framework in order to strengthen enforcement. It is hoped that the implementation of RIL in Fiji will reflect a change from the "business as usual" operations to a more sustainable harvesting of Fiji's various forest ecosystems.

2. TERMS OF REFERENCE

The terms of reference for this consultancy are defined by the following objectives:

1. To provide recommendations for the implementation of RIL in Fiji.
2. To assess the RIL components of the NCOHP and develop, where appropriate, regulations to ensure compliance.
3. To share experiences and develop strategies with Fiji Forestry Department and concerned stakeholders on the concept and implementation of RIL.

This report seeks to address these objectives by presenting a review of the elements of the Code followed by a discussion on how the implementation of RIL can be strengthened through changes in the Code and, through preparing the Code for codification under the law.

Implementation of the terms of reference involved visiting industries and logging operations on both Viti Levu and Vanua Levu. Field visits were made to logging areas in the natural forest, pine forests and mahogany forests on both Viti Levu and Vanua Levu.

It is understood that the evaluation of the NCOHP should apply to all forest types on Fiji.

3. STAKEHOLDER CONSULTATION AND FIELD VISITS

Field visits and consultations were organized by the Fiji Forestry Department with Mr. Tomasi Kubuabola, Acting Deputy Conservator of Forests accompanying the consultant for the duration of the field visits and stakeholder consultations.

A copy of the work program is appended in Annex I. The only significant deviation from this work plan occurred on Tuesday, October 2nd when time constraints permitted only one visit to a logging site of the Fiji Forest Industries in a native forest area.

4. THE CONCEPT OF 'REDUCED IMPACT LOGGING' (RIL)

The concept of reduced impact logging (RIL) first emerged in the 1990's with the realization that logging practices in many of the worlds tropical forests where selective logging regimes were being implemented, resulted in unacceptable and unsustainable high levels of degradation.

Over the years, various organizations have implemented trials in RIL or developed generic standards for its implementation. ITTO has long supported the concept of RIL and has been the funding facility to support training programs and research into the benefits of RIL. One of the better publicized research efforts funded by ITTO has been the studies conducted by the Center for International Forest Research (CIFOR) in the Malinau District of East Kalimantan, Indonesia. ITTO also played a major funding support role for RIL research and training programs delivered by the Tropical Forest Foundation (TFF) in Brazil, Indonesia, Guyana and Gabon.

Bilateral assistance programs such as GTZ, DFID, USAID, and the EU have also sponsored RIL research, demonstration and training in various jurisdictions in the humid tropics. However, it has been the TFF that has played the largest and most sustained role in developing both generic standards[1] and country specific standards for RIL.

The approach to defining RIL has usually been a holistic one irregardless of the organization which has advocated adoption of RIL. RIL is usually viewed as management

[1] A generic standard for RIL is posted on www.tropicalforestfoundation.org and www.tff-indonesia.org.

prescriptions rather than regulations and in most jurisdictions, is seen as a guideline for the achievement of biologically sustainable forest management.

In Brazil, Indonesia, and Guyana where RIL training programs are well established and broadly recognized, the concept of RIL is seen as an essential condition for forest certification by FSC accredited certifying bodies.

The following elements of forest management are broadly accepted as defining RIL and are common to most attempts to define and promote the concept of RIL.

1. Forest inventory and information collection
2. Preparation of operational scale contour and tree position maps
3. The creation of operational, environmental, and utilization standards as a basis for guiding detailed operational planning and controlling the standard of forest harvesting activities.
4. Opening of the forest prior to commencement of felling activities.
5. Emphasis on operational activities such as opening of skid trails, directional, felling, etc.
6. Monitoring of operations and post harvesting evaluation.
7. Deactivation and rehabilitation activities.
8. Management systems to ensure successful adoption of all aspects of an RIL management regime.

The details and emphasis placed on each of these elements or steps, will depend on the jurisdiction and the regulatory framework that is already in place.

These common elements defining RIL will be used to evaluate the NCOHP. For the sake of simplicity, the word 'Code' will be used interchangeably with NCOHP.

5. THE FIJI NATIONAL CODE OF HARVEST PRACTICES

Fiji is endowed with extensive forest resources that provide important environmental, social and economic benefits to its people. The wise use of these resources is essential if their multiple values are to be maintained for the benefit of future generations.

Forest harvesting can generate many economic and social benefits. However, poor practices can lead to serious environmental degradation and adverse impacts on regional communities. Fiji has signaled its commitment to conserve and sustainably manage its forests through a number of international and regional conventions. Fiji's National Forest Policy Statement seeks to achieve a thriving forest industry that operates in cooperation with landowners to achieve the sustainable management and utilization of the country's forests.

It is clear that the 'Code' is an important part of the national approach to sustainable forest management. It provides practical guidance to forestry officers, landowners, contractors and the forest industry on how forest harvesting should be conducted o as to achieve best practice and minimize any adverse impacts.

It is understood that the Code applies to all forest harvesting operations within Fiji. However, without a more solid grounding the legal, regulatory framework of the country, enforcement of the Code remains problematic.

5.1 The History of the Code

The concept of a 'Code of Harvesting/Logging Practice' was first initiated by the Asia Pacific Forestry Commission (APFC), the regional office of the FAO. The initial 'Code' was modeled after the Tasmanian Logging Code of Practice.

The APFC has assisted forestry departments in countries throughout the Region to develop their own 'Code of Practice'; some countries have adopted these codes and others have ignored them. Fiji, probably more than any other Southeast Asia – Pacific nation, has taken the code on board and adapted it to its own situation. This is probably a reflection of a poorly developed regulatory framework governing how the country's forest resources are to be managed and regulated.

5.2 Observations and Comments

The Code consists of 18 sections. Observations and comments are offered on each of these sections as part of the evaluation of the existing Code. These comments are intended to highlight the strengths and weaknesses of the Code in as much as is possible given the short nature of this consultancy.

1. Scope

The Code clearly states that, "*The Provisions of the Code are legally binding on all parties and individuals involved in marking, felling, extracting, loading and hauling wood and wood products from all forests in the Republic of Fiji."* This statement brings into focus two issues.

Based on discussion with Forestry staff and other stakeholders, there appears to be a question as to the legal weight of the Code and its enforcement within the legal framework in Fiji. It would seem that a consensus will have to be reached and appropriate legal arrangements will have to be made before all or part of the provisions of the Code can be legally enforced.

The second issue raised by this statement defining the scope of the Code, is the jurisdictional issue related to the management of Fiji's mahogany forests. Both the Fiji Mahogany Industry Development Decree 2010 and the Mahogany Industry (Licensing and Branding) Decree 2011, supersede the Forest Decree of 1992 and both place the jurisdiction over the country's mahogany forests in the hands of the Mahogany Industry Council under the jurisdiction of the Ministry of Public Enterprises, not the Forestry Department.

Although the Mahogany Industry (Licensing and Branding) Decree 2011, contains under Section 4, a slightly modified Code entitled the "Fiji Plantation Grown

Mahogany Harvesting Code of Practice", the essential difference between the two Codes is that in the case of mahogany plantations, overarching responsibility rests in the hands of the Mahogany Industry Council with all planning, operational and monitoring functions in the hands of the Fiji Hardwood Corporation Ltd.

For the purpose of all further discussions the **'Code'** will be used to refer to the NCOHP and the **'Mahogany Code'** will be used to refer to the Fiji Plantation Grown Mahogany Harvesting Code of Practice.

2. Legal Compliance

This section is clear in both the Code and the Mahogany Code. The Code does reference the Fiji Mahogany Industry Development Decree 2010 which removes jurisdiction over the country's mahogany forest from the Department of Forests but does not elaborate on the potential implications of this, particularly with reference to the monitoring functions. This clearly will have ramifications if the country decides to codify the Code into the national legal framework.

3. Pre-operational Inspection

This is a very relevant addition to the Code and highlights the complex ownership and jurisdictional issues inherent in the development and management of Fiji's forest resources.

4. Pre-harvest Inventory

Preharvesting inventory sampling procedures were discussed at various times during the field visits and consultations. Although the details of such procedures are not included in the Code, their existence as stand-alone guidelines is understandable and acceptable.

Inventory procedures that have been developed for the native forests, use a sampling methodology to arrive at an estimate of harvestable stems and volume for the proposed cutting permit area. This is in contrast with most tropical jurisdictions in West Africa, South America, and Indonesia where a 100% sampling is employed to enumerate and map each tree of harvestable size and species.

In Fiji, harvestable trees tend to be small in diameter and height but much more plentiful than in the Dipterocarp forests of SE Asia.

It is, however, not clear what if any inventory procedures have been proposed for the country's pine and mahogany forests.

5. Silviculture Prescriptions

Silviculture prescriptions as presented in the Code, deal primarily with species specific diameter limits and the pre-harvesting marking of trees to be cut.

Two technical[2] reports[3] were reviewed to gain an understanding of the rationale for proposing species specific diameter limits. It is clear that a great deal of research has been carried out to develop this rationale and to establish a proposed a species specific diameter limit table for light, medium and heavy logging intensities. The rationale appears sound and supported by intensive analysis of stand structure and growth rates.

The evolution of species specific diameter felling limits has been proposed in other tropical, polycyclic management regimes but the Consultant is not aware of any other jurisdiction where it is actually being effectively implemented. In this regard, Fiji appears to be most advanced in moving towards implementation of this stand specific management regime.

It appears unlikely that the same level of sampling and analysis can be carried out routinely as was done in the Drawa and the Nakavu model areas. Stakeholder discussions and field visits suggest that the norm for planning harvesting operations in the country's natural forest is heavily influenced by the landowners desire for immediate revenue.

Tree marking prior to felling is proposed under the Code but not yet implemented. This procedure, if implemented, could form the basis for the creation of detailed contour and tree position maps which would strengthen the implementation and monitoring performance. Technical and financial feasibility of implementing this aspect of the code will have to be ascertained before it can be incorporated into a regulatory context.

During field visits to the pine areas, it was noted that replanting occurred immediately after logging thus ensuring full stocking and minimizing risk of site loss to competing vegetation. However, observations made in the mahogany logging areas at Nakurua Station, noted that replanting was being done two years after logging. Apart from the much higher site preparation, planting, and weeding cost resulting from such a delay in restocking the plantation area, the risk of long-term site loss to liana and competing exotic vegetation is considered to be very high.

6. <u>The Harvesting Plan</u>

The Code provides considerable detail on the provisions and content of a harvesting plan. This is certainly commendable since experience has shown that a detailed plan based on a sound understanding of ground and forest conditions, is a vital prerequisite to achieving a low impact harvesting.

[2] 1995, Jaap de Vletter, "Natural Forest Management Pilot Project", Technical Report No. 27, Silvicultural Research Division, Dept. of Forestry, Fiji

[3] 2003-2012, "The Drawa Model Area Forest Management Plan"

Field visits confirmed the existence of harvesting plans, however, it proved difficult (if not impossible) to verify that all aspects of the plan were being followed in the field. The difficulty arises when field inspections attempt to confirm compliance with all of the planning and technical requirements prescribed under the Code and relate primarily to limitations of scale and detail on the available maps.

All planning maps reviewed during the various field visits, were at a scale of 1:10,000 and were created from a 1:50,000 map base 20m contour intervals. This means that the detail used for planning and evaluation/monitoring of the harvesting plans is essentially 1:50,000. Given the rugged nature of the terrain and the level of detail that the Code expects the logging contractor to follow, this scale of mapping is clearly inadequate.

The Code requires a map scale of 1:10,000 or 1:50,000 and an additional map showing tree positions and details of the extraction network at a scale of 1:5,000 or 1:2,000. Such maps can only be prepared by starting with new imagery and mapping or, by conducting intensive ground surveys and then creating a map based on field data. In any case, it is clear that the Code's recommendation that tree marking be conducted prior to harvesting, is not being implemented anywhere within the Fiji native forest estate.

It was noted that the Fiji Hardwood Corporation (FHCL) had 1:10,000 scale photography done for four of the most mature mahogany plantation areas. The product is understood to be a photo mosaic at 1:10,000. It is also understood that contour and forest type maps were not requisitioned from the foreign contractor after the initial imagery acquisition.

7. Training and Accreditation

Training and accreditation requirements as detailed in the Code, are more rigorous than in most RIL training programs and highly commendable.

If fully implemented, these requirements should go a long way to ensuring that the goals of the Code and the prescribed practices are carried out with the minimum of impact by imparting a clear understanding of the rationale of the Code to all levels of the workforce.

8. Weather Restrictions

Weather restrictions are logical and easy to follow as presented in the Code.

They are, however, a reflection of the fact that forest access roads for the most part are not built to all weather standards. This, in turn, is a reflection of the fact that most planning and development of cutting permits is done on a short term basis which makes the construction of all weather roads economically unfeasible.

Field visits to two logging areas in the native forest served to highlight the complaints that industries voiced regarding the tenuous nature of their wood supply which was largely dependent on good weather to permit daily trucking in order to meet the needs of the industries.

As long as the logging contractor operates on a year-by-year basis, he will be unwilling to make the necessary investment to construct and maintain an all weather road system. This issue has also been discussed under 'The Harvesting Plan'.

9. Buffer Strips

The concept of buffer strips has been well developed in the Code. While one could debate the appropriateness of stream categories and buffer widths as presented in Table 9 in the Code, the intention of protecting riparian zones and water quality is clear.

Field visits to native logging areas could not confirm the demarcation of stream buffers although it appeared unlikely that they would be violated during the logging owing to the very steep nature of the terrain.

The code accommodates harvesting in buffers in pine and mahogany plantation areas and presents realistic guidance on what should and should not be done in the buffer zone. Field observations, however, clearly showed that guidelines for buffer zones in plantation areas were not being followed.

It is suggested that the Code include a clause which commits returning buffer zones to native vegetation thereby avoiding this issue in subsequent rotation cycles.

10. Road Access

The road access section of the Code has been very well developed. It is clear that the existing body of knowledge and reference material has been extensively integrated into the Code.

Field visits suggest that in plantation areas which were developed some 30 to 40 years ago, road standards generally comply with the code. In these areas, very little new roading is required since most of the roads were developed during the initial rehabilitation and plantation phase.

In native forest areas where harvesting operations have been going on for a long time, main roads appear to be well built and maintained, however, for new cutting permits issued under short term license arrangements, road construction and maintenance is clearly well below the standards set out in the Code. The most likely explanation for this discrepancy probably relates to the fact that operators under short term license have very little security of tenure and are, therefore, poorly positioned to make the necessary investments in a Code-compliant road system.

11. Felling Operation

Content of the Code under the heading of 'felling operations, has been well developed. Two comments are offered under this section.

The first comment relates to the obvious violation of the Code with respect to felling in and around buffer zones. This was particularly noteworthy in the mahogany logging area visited where perennial streams were buried in logging debris.

The second comment concerns the lack of any utilization standard in the Code. Waste generated in any harvesting operation, if allowed to go on unchallenged, represents potentially significant underutilization of the trees that are felled resulting in substantial economic loss.

To create the basis for better utilization, it necessary to develop clear utilization standards which lay out the quality parameters, which then become the standard for guiding felling, bucking, and grading in the various field operations. Some of the considerations normally included in a utilization standard would be: species specific grades, minimum diameters, tolerance limits for various defects, etc.

It is strongly recommended that basic and separate utilization standards be developed for native timbers, pine, and mahogany. These utilization standards should be built into the Code. Field orientated felling and bucking guidelines can then be developed for the field staff to guide their activities in order to ensure that trees that are felled are utilized to their fullest and best potential.

Field observations suggest that utilization in the native forest is being done to a reasonably good standard.

In the pine forests, the main issue appears to be the allocation of logs to their best use. A utilization standard would ensure that larger logs are always allocated to high end uses and that smaller and lower quality logs are fully utilized for the production of chips.

The poorest utilization was observed in the mahogany logging areas. Significant numbers of left logs were noted in the areas where logging had already been completed. This has two possible explanations. Either the supervision was very lax, or the absence of utilization standards permits this situation to develop.

12. Skid Tracks

The Code recognizes the importance of skid trail planning and construction and is generally in compliance with widely accepted norms for ground based extraction systems.

It was noted that the Code specifies that skid trails should not exceed 46% except for short distances. While the recommended machine (D6) is lighter than a D7G

commonly used in Indonesia and Papua New Guinea, and is, therefore, more able to negotiate such steep gradients, it is felt that such a steep tolerance limit will greatly increase impact and the risk of erosion.

The Code specifies that skid trails should be located and opened prior to commencement of felling. While there was some evidence of skid trail marking in the native forest areas visited, the general impression was that skid trails are not commonly located or opened prior to felling and are very much left to the discretion of the logging contractor.

13. Landings

This aspect of the Code appears to be well thought out and no negative impressions were gained during the field visits.

14. Rehabilitation of Harvest Area

This section has been very well developed and covers all concerns related to the rehabilitation of road and skid trail infrastructure.

It might be worth considering a change to the title of this section to "Rehabilitation of Harvesting Infrastructure" since the current title suggests rehabilitation of the logging area in general.

It was noted that due to the heavy felling regime and the presence of a number of highly invasive liana and exotic tree species is some areas, the risk of productive site loss should require silvicultural intervention. This issue should be addressed. Whether to do this within the framework of the Code or as a stand-alone technical guidance will, no doubt, require further discussions.

15. Forest Hygiene

The topic of forest hygiene has been very thoroughly developed in the Code and provides a solid basis for regulation.

16. Harvesting Machine Standards

Machine standards are very well developed in the Code.

17. Harvesting Supervision

This section has been rigorously thought through and should require no further modifications.

18. Monitoring and Evaluation of Operations

Discussions with District Forest Officers and forest industry representatives during the course of the field visits, made it very clear that a great deal of emphasis is placed on the monitoring of forest operations. The Code itself, provides clear statements of how the monitoring of forest harvesting shall be carried out.

It is understood that monitoring is done on each logging operation monthly at the beat level. In addition, spot checks of licenses are carried out by District officers on a quarterly basis. This is further reinforced by bi-annual spot checks at the national level.

A one page monitoring form is used to evaluate each operation. The monitoring system and form currently in use, requires that samples of various criteria be evaluated in the field, such as segments of roads, skid trails, buffer zones, etc. These samples are evaluated with a "yes" or "no" answer corresponding with compliance or non-compliance with the code standard. A 'weight' or multiplier, which reflects the significance of the criteria being evaluated, is then applied to the score and the resulting total score is expressed as a percent compliance with the Code.

This rigorous and systematic approach to evaluation should provide a highly sensitive evaluation of an operators compliance with the code for the criteria being evaluated. However, it was noted that evaluation scores were consistently in the 80 to 90% or higher range (The lowest score noted during the field visits was 77%).

It was also noted that the comments section on the monitoring forms often contain recommendations suggesting serious need for improvement despite the fact that a very high score had been achieved. These sort of comments were reinforced through field observations where obvious non-compliance issues were noted.

Some possible explanations for this apparent discrepancy between consistently high monitoring and assessment scores and the much less favorable field realities could include:

1. Collusion at the evaluation level: Unlikely given the frequency of the evaluations and their multi-leveled application.
2. Inexperienced evaluators: Possible but considered not to be a major contributing factor since all evaluators should have gone through a Forest Department course on monitoring and assessment.
3. Map scale: The scale of 1:10:000 is the scale at which operational harvesting plans are prepared and the scale which is used for monitoring. What is shown on the plans at this scale is little more than a conceptual representation of what should be on the ground. This is a weak basis from which to conduct detailed on-site monitoring and evaluation.
4. Time requirements: The monitoring form requires sampling of 3 segments of roads, skid trails, landings, and exclusion (buffer) areas. The time required to carry out such an intensive sampling may be a constraint due to access issues.
5. Design of the monitoring form: The "yes/no" scoring of each criteria lacks sensitivity and does not really capture the variations in compliance. This is probably the most significant dimension of the monitoring and assessment system requiring a thorough review and possible restructuring.

Monitoring of harvesting operations against environmental and other performance standards must provide a consistently accurate and sensitive measure of compliance. This is necessary for the monitoring to have any real meaning and even more necessary if there is an intention to attach penalties and/or rewards to the results of the monitoring.

The issue of who is responsible for monitoring harvesting operations in the country's mahogany forests is not clear and should be addressed if any credibility is to be attached to this monitoring. According to current regulation[4], the Department of Forests does not have jurisdiction over the mahogany forests.

There is clearly a need to deal with this issue and to bring the monitoring of all of the countries forests under one jurisdictional authority in terms of monitoring compliance with the Code.

6. RIL AND THE CODE

Taking into account the comments on the Code as presented in the previous section, Section 6 will focus on the relationship between the Code and the elements of RIL, specifically by identifying where the Code still falls short of the generic requirements of an RIL system

A comparison between the Code and the concept of RIL will be constrained by an examination of the documents provided, field observations, and consultations with stakeholders.

1. Forest inventory and information collection

The preplanning stage of an RIL management regime requires detailed inventory and the collection of all information which could assist the achievement of site specific logging planning. In many humid tropic jurisdictions practicing selective logging, 100% inventory is routinely prescribed if not always followed.

Justification for such an intensive inventory should rest on a solid financial rationale as well as on practical considerations. In much of the West African forests where harvestable stems occur in very low densities, tree mapping is an important aspect of achieving logging efficiency and recovering maximum value.

In other tropical jurisdictions, marking and mapping of harvestable trees is regulated and practiced to varying degrees of success. Tree numbering and mapping is frequently seen

[4] "Mahogany Industry (Licensing and Branding) Decree 2011" (Decree No. 53) removes the country's Mahogany forests from the jurisdiction of the Department of Forests.

as the first step in capturing royalty and in the implementation of effective chain-of-custody systems.

In general, the larger the number of trees to be harvested and the more uniform their distribution in the overall forest area, the less utility is derived from a 100% inventory where a much lower sampling intensity can yield very comparable results. Cost is clearly also a factor in determining whether a 100% sampling should (or could) be carried out.

In plantation forests, statistically valid sampling is clearly sufficient to arrive at an accurate estimate of standing stock and harvestable volume. In Fiji's situation with a relatively large number of harvestable stems per hectare, a statistically valid sampling procedure appears to be a legitimate approach to arriving at a reliable forest inventory.

Finally, efforts at implementing an RIL management regime in rugged topography comparable to that found in Fiji, have been influenced more by the details of the topography than by the position of the trees.

The Code highlights the need to gather all relevant information which could influence planning and operations and in this regard, existing requirements of the Code are well in line with RIL principles.

2. Preparation of operational scale contour and tree position maps

There is no doubt that in order to achieve the goals associated with successful implementation of an RIL management regime, detailed maps are required. A minimum scale for such operational maps is generally considered to be 1:5,000 showing contour intervals of not more than 5 meters.

Fiji currently does not have such maps. Existing 1:10,000 maps blown up from 1:50,000 base maps do not provide sufficient detail to allow accurate planning or monitoring at an operational scale. This seriously constrains RIL planning as well as the monitoring of operational activities.

3. The creation of operational, environmental, and utilization standards as a basis for guiding detailed operational planning and controlling the standard of forest harvesting activities.

In general, the Code does a reasonable job of addressing the issue of standards as a basis for guiding detailed operational planning and controlling the forest harvesting activities.

The only area where serious consideration should be given, is to include basic utilization standards in the code in order to introduce the concept of optimum resource use and maximizing the benefit from trees that are felled.

There is currently no mention of utilization issues in the code and field observations suggest that high levels of waste and inappropriate allocation of logs results in lost revenue and economic opportunity (refer to item 11 under section 5.2).

4. Opening of the forest prior to commencement of felling activities.

Opening skid trails prior to the commencement of felling activities ensures that the planned extraction network is effectively realized. It assists fallers in decision making regarding which trees to fell and assists in directional felling. It also reduces the cost of exploring extraction options using an expensive machine.

The Code adequately addresses this element of an RIL management regime. Actual implementation of the Code's prescription in this regard could, however, not be verified.

5. Emphasis on operational activities such as opening of skid trails, directional, felling, etc.

This element of an RIL system is also thoroughly addressed under the Code and should require no further modifications.

6. Monitoring of operations and post harvesting evaluation.

Under any RIL system, monitoring and evaluation activities are essential activities as they provide Management with feed back on the implementation of RIL goals and the identification of problems.

The Fiji'n approach has been to place the monitoring and evaluation functions directly in control of the Department of Forests while in other jurisdictions (for example Indonesia), monitoring and evaluation are functions that companies are encouraged to develop internally. The Fiji'n approach is justifiable given the structure of the industry, the land ownership arrangements, and the tenures under which harvesting activities are carried out.

A discussion of monitoring of performance under the Code, has been provided in the previous section of this report. Issues related to the sensitivity of the monitoring and scoring system suggest that this activity should be thoroughly reviewed before any attempt is made to regulate the Code.

7. Deactivation and rehabilitation activities.

Deactivation and rehabilitation issues are dealt with very adequately under the code and are comparable to standards set out in any RIL system.

8. Management systems to ensure successful adoption of all aspects of an RIL management regime.

RIL training in Indonesia places a great deal of emphasis on the development of management systems. Indonesian companies tend to be quite large and Management functions are segregated according to departments. Switching to an RIL management

regime usually requires changes in the status quo that affect each department in its own unique way.

Without the establishment of a management imperative and management systems such as a set of standard operating procedures, the successful realization of RIL goals can be difficult to achieve.

The situation in Fiji is considerably different. Companies are small and not compartmentalized. In addition, the concept of regulating management systems is well outside of the domain of a document such as the Code.

Attempts to strengthen Fiji'n logging companies ability to adopt RIL from a management perspective, would be best addressed under an outreach program involving workshops, management seminars, and management guidelines.

7. SUMMARY OF RECOMMENDATIONS TO STRENGTHEN THE CODE

The mandate of this study includes examination of the Code to see how it can be strengthened by integrating RIL concepts.

Various revisions to the Code over the years has produced a document which essentially incorporates most elements of an RIL management system. However, there are still a few significant gaps between the current content of the Code and an RIL standard.

The following recommendations are put forward to address these gaps and thereby strengthen the overall effectiveness of the Code as a standard which could be regulated and which would form the basis for a robust set of practices designed to achieve sustainable forest management for all of the forest types of Fiji.

Recommendation 1: Mapping Requirements for Planning

It is recommended that the map scale for the preparation of the operational plans be 1:5,000 or bigger. Such a new map base must be prepared from imagery using standard areal photography or Lidar[5] data capture techniques, or can be created from ground based surveys.

New, more appropriate scale maps are essential for detailed operational planning and for effectively monitoring and evaluating implementation of the various elements of the Code.

[5] LiDAR stands for "Light Detection and Ranging" and is similar to radar sensing technology. For more information, Google 'LiDar' or download the July 2011 issue of "Reduced Impact Logging and Certification" newsletter from www.tff-indonesia.org.

Recommendation 2: Forest Inventory and Tree Marking

The feasibility of conducting a detailed inventory combined with tree marking on a coupe basis needs to be investigated. This is particularly relevant since the current version of the code recommends tree marking.

Recommendation 3: Utilization Standards

It is recommended that utilization standards be developed for the native forests as well as for the pine and mahogany plantations. These standards should be incorporated into the Code to strengthen the concept of maximizing recovery and ensuring the most appropriate allocation of the best use.

Utilization standards would also be required if this issue were to be included under a regulator enforcement strategy for the achievement of sustainable forest management and overall Code adoption.

Recommendation 4: Revision of Monitoring Methodology

It is recommended that the current monitoring form be revised to introduce a greater sensitivity in the evaluation of compliance with the various aspects of the Code.

The current monitoring form and methodology appear to give consistently high scores despite the fact that field conditions clearly indicate that major issues of compliance are still fairly common.

Revision of the current monitoring form and methodology is particularly significant if the government has an intention of legalizing the Code under law and attaching penalties for non-compliance.

8. REGULATING THE CODE

The terms of reference for this consultancy, request the development of regulations where appropriate to prepare the groundwork for enshrining the Code within a regulatory framework. The primary motivation for institutionalizing the Code within the laws of the country, would be to enable more effective enforcement using a system of penalties enforceable under the law.

This approach is completely different from other SE Asia-Pacific jurisdictions, where the Code has no weight under the law and where the concept of reduced impact logging is totally voluntary.

In Fiji, given the absence of a comprehensive set of regulations to guide forest managers and regulatory bodies towards the achievement of sustainable forest management, the institutionalizing of the Code under a regulatory legal framework, is clearly a viable option.

Although a ten day consultancy is hardly an appropriate platform from which to propose regulations, there are a number of broader issues that have been identified as needing attention before the Code can be adopted under law. These issues are overarching and do not take away from the need to make adjustments to the Code as recommended under section 7 of this report.

8.1 Jurisdictional Issues

Fiji is faced with a curious situation where all of the forests of the country except the mahogany plantations, are under the jurisdiction of the Fiji Forest Department. Mahogany forests have recently been placed under the jurisdiction of the Mahogany Industry Council within the Ministry of Public Enterprises.

The Mahogany Industry (Licensing and Branding) Decree 2011 (Decree No. 53) includes a slightly modified version of the Code referred to as the "Fiji Plantation Grown Mahogany Harvesting Code of Practice". One of the key differences of this Mahogany Code from the original Code, is that it places the responsibility of harvesting monitoring under the jurisdiction of the the Fiji Hardwood Corporation Limited which is also vested with all responsibilities of management of the mahogany resources.

If the government wishes to enshrine the Code in a legal, regulatory framework, the jurisdictional issue visa vi the different forest types of the country will have to be resolved in order to ensure a uniform, equitable, and transparent evaluation and regulation of the Code.

8.2 Tenure Issues

Pine and mahogany plantations in Fiji are generally being managed under long term lease agreements, however, the majority of the native forests are being harvested under one year or short term licensing arrangements.

Since logging contractors frequently only have a one or two year horizon with little security of further tenure in the adjacent logging coupes, there is virtually no incentive to invest in durable infrastructure or treat the forest as anything other than an immediate source of revenue.

There is a need to explore the possibility of longer lease arrangements to tenure agreements with landowners to ensure that the native forests are being developed and managed sustainably according to the standards set out in the Code.

8.3 Enforcement Issues

The Code is part of the Fiji Forest Department policy but enforcement of the Code is hampered by legal issues. Since the code is essentially a policy document and has no clear basis in the country's legal framework, enforcement of penalties for non-compliance have often not stood up to legal challenges.

Technical constraints such as the lack of sensitivity in the evaluation procedures as well as inappropriate map scales will also have to be overcome before legal enforcement can become an effective incentive for full compliance with the Code.

An additional challenge that will have to be addressed, is the issue of ownership and responsibility. Landowners, usually represented by communities, contract logging companies who are required to conform to the standards set out in the Code. The landowners primary interest tends to be one of maximizing revenue and pressuring the logging contractor to do so, even if it means contravening sections of the Code. If the Code is placed in a legal framework, the issue of responsibility will have to be addressed in the case of violation of the Code.

8.4 All or Nothing

Finally, the question of creating regulations governing implementation of the Code, has been explicitly included in the Consultant's terms of reference. This is a complex issue and subject to a wide range of opinion.

The intention of the Code is to ensure sustainable management of the forest and its associated values to the maximum benefit of the landowners and society in general. This goal can only be realized by regulating harvesting activities according to technical standards that aim to minimize risk and maximize assurance that the overall goal can be achieved.

To create specific regulations on various technical aspects of the Code that can be enforced by law will surely create distortions and problems and is unlikely to give the necessary legal weight to enforcement of the Code to ensure effective compliance. It is therefore, recommended that once technical matters of enforcement are resolved, the Code in its entirety should be adopted under law as a standard for regulating the sustainable management of Fiji's forests.

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ANNEX I ITINERARY OF FIELD VISITS AND CONSULTATIONS

SPC / GIZ Regional Project
Climate Protection through Forest Conservation in Pacific Island Countries
PN 10.9073.7-001.00

Reduced Impact Logging Expert Fiji
Mr. Arthur W. Klassen

Work Program
Fiji Forestry Department Accompanying officer:
Acting Deputy Conservator of Forests (Operations) Mr Tomasi Kubuabola (Tel. 9906912)

Each field trip day concludes with a debriefing session where the consultant clarifies certain issues as he tries to match and sum up what he heard in the office during the discussion, and his observation in the field.

Tue 25th September

06.55 pm	Arrival at Nadi Airport FJ 910 from SYD (welcomed by Mr. Karl P. Kirsch-Jung, GIZ)
07.30 pm	Dinner with Mr. Karl P. Kirsch-Jung (meet at Novotel) Overnight at Novotel Nadi

Wed 26th September

8.30 am	Pick up at Novotel Nadi by Mr Tomasi Kubuabola
9.00 am	Meeting with DFO Western Mr Tevita Evo
10.00 am	Meeting with Fiji Pine Ltd, Manager Operations: Mr George Vuki/Adriu Nabora
11.00 pm	Meeting with Fiji Pine Trust, CEO Mr Osea Naiqamu
1.00 pm	Visit to Fiji Pine Plantation Logging Area
6.30 pm	Meeting and Dinner with Fiji Forestry at Tanoa Intenational Hotel (Conservator of Forests Mr. Samuela Lagataki) Overnight at Novotel Nadi

Thursday 27th September

07.30 am	Pick up at Novotel Nadi
10.00 am	Meeting with DFO Southern Mr Sireli Vunibaka; Operations Manager Southern Forest Ltd Mr Amena Tuisawau; and Forester Vunimaqo Mr Setareki Namuloilagi
11.00 am	Visit to Vunimaqo Logging Area (Natural Forest Logging)
4.30 pm	Team debriefing back at Vunimaqo Office
5.00 pm	Drive to Suva, Overnight Holiday Inn Suva

Friday 28th September

10.00 am	Meeting with Fiji Hardwood Corporation Ltd, Mr Simione Sigaca
11.00 am	Meeting with Fiji Mahogany Trust, Mr Sekope Bula
12.00 pm	Field Trip to FHCL Logging Area (Nukurua Mahogany Plantation Logging area)
4.00 pm	Team Debriefing back at Nausori Office

Overnight Holiday Inn Suva

Saturday 29th September Overnight Holiday Inn Suva

Sunday 30th September

01.00 pm Pick up Holiday Inn Suva
03.40. pm Flight to Vanu Levu - Labasa (FJ 36)
Overnight Labasa (organized by FD)

Monday 1st October

8.30 am Meeting with DFO Northern Mr Viliame Cegumalua
10.00 am Meeting with Valebasoga Tropic Boards Mr Muktar Ali
12.00 am Meeting with Waiqele Sawmill, Mr Ahmed Begg
2.30 pm Meeting with Fiji Forest Industries Manager Mr, Joni Duikoro
Overnight Labasa (organized by FD)

Tuesday 2nd October

9.00 am Visit 3 Logging Sites,
1 Inside FFI Concession
2 Inside Fiji Pine Logging Area
3 Inside Waiqele Logging Area
(*Option--May need to organize a dinner for 7 people in a Labasa restaurant with the purpose of debriefing, FD can pay for this*)
Overnight Labasa (organized by FD)

Wednesday 3rd October

8.35 am Depart Labasa for Suva (FJ 31)
10.00 am Meeting at FTC Discussion in Preparation for Thursday National Workshop
3.00 pm Consultant is free to prepare to the Consultation Workshop on Thursday
Overnight Holiday Inn Suva

Thursday 4th October

National RIL Consultation Workshop
Overnight Holiday Inn Suva

Friday 5th October

10.00 am Depart Novotel Suva for Nausori Airport (Holiday Inn shuttle)
12.25 am Depart Suva / Nausori for AKL (FJ431)

ANNEX II WORKSHOP ITINERARY

Field Notes – GIZ Consultancy on RIL – FIJI

[*Entire field tour in accompaniment of Mr.* ***Tomasi Kubuabola,*** *Acting Deputy Conservator of Forests (Operations)*] Tel. 9906912

Wednesday, 26th September

Meeting with DFO Western **Mr. Tevita Evo** (and staff)

- Discussed planning: company prepares long term management plans and individual logging plans (cutting permit applications); picked up a sample cutting permit application and a sample monitoring form.
- Discussed monitoring: Monthly monitoring reports at beat level; quarterly spot checks of licenses by District officers; bi-annual national spot checks. Workshops conducted in each district to discuss evaluation reports including the participation of the contractors.

Meeting with Fiji Pine Ltd., Manager Operatons, Mr. **George Vuki** / Adriu Nabora (and staff)

- Fiji Pine Ltd. started as a gov't company but is now privatized. It is a forest based company with multiple shareholders (villages)
- Fiji Pine is mandated to look after the management and harvesting of all pine plantations in Western District.
- +/-45,000 ha of Pinus caribea. This is (long term) lease land +/-1,000 ha of Mahogany; scattering of other species.
- Overseas the harvest of +/-300,000 tonnes/year from Viti Levu (1,300 ha/yr.) and +/-200,000 tonnes/year from Vanua Levu (500 ha/yr)
- South Island (Viti) has 6 stations (beats). Each station has a contractor which is essentially a Landowner company.
- Fiji Pine Ltd. has an active interest in FSC certification and has already had a Pre-Assessment carried out by SCS
- Logging is done mostly with rubber tired skidders (Cat 158 and Bell Superloader 220 or 225) using winch
- Noted quite broken terrain but access didn't seem to be too much of a problem
- Noted the practice of burning slash and then immediately planting
- No planting in past 5 years by FPL, consequently will have to reduce harvest volumes for next 7 years starting 2013 and focus on replanting.

Meeting with Fiji Pine Trust, CEO Mr. Osea Naiqama was unavailable; met with Seruvi Cawi, Mgr. Extension Services and Mr. Esala Nakalevu, Mgr. Corporate Services.

- Fiji Pine Trust (FPT) is an NGO set up to represent the interests of the land owners. It was separated from Fiji Pine Ltd. in 1999.
- Fiji Pine Trust has a 0.02% share in Fiji Pine Ltd. (first dividend pay out in 1990)
- FPT is funded from Fiji Pine Ltd. ($250,000/year) and community owned plantation groups ($285,000/year).
- The lands (pine plantations include: (a) the 45,000 ha of leased land, plus (b) community owned plantations of >20 ha locations including on the outer islands.
- FPT looks after the interests of the landowners including the setting up of mobile sawmills.
- Started promoting resin taping to bring better economic value to pine plantations, particularly those set up the communities in the outer islands where processing and transportation of timber is a problem.
- In the past, machine operators were trained in the Lolo Forestry School, shut down in late 1990's, and moved to Land Transport Authority in Suva but machine operator courses were not continued.
- Dept. of Forests (Suva) now provides machine operator courses as well as courses for logging supervisors and contractors
- Code issues: appropriate scale maps are not available; in most cases, landings, skid trails, etc. are not marked in the field for the contractors

Field visit to Tabakubu Block in Lolo Forest

Access restricted because of last night's flash flood; visited a recently logged area which had been burned and very recently planted.

Evening meeting with the Conservator of Forests, Mr. Samuela Lagataki at a dinner function organized by GTZ, etc. etc.

Thursday, 27th September

Meeting with DFO Southern, Mr. Sireli Vunibaka and staff

- Looks after native forest and mahogany plantations (some pine)
- +/-30,000 cu.m./yr from natural forest; no fixed rotation cycle
- Native forests used to be managed under a concession system but this has now stopped. Landowners prefer the annual cutting permit system because they can negotiate better revenue/contract arrangements. This means that the Forest Department really has no control over the scheduling of harvesting.
- Improvements since the code was implemented include wet weather shut down guidedlines.
- Diameter limit tables being introduced; currently a diameter limit of 35 cm is applied. Tree marking used to be done but not any more;
- Weakness still in the enforcement;
- Base maps are 1:50,000 (contours 20m) blown up to 1:10,000 as a basis for all submissions and planning.

Field visit to a natural forest logging area.

- Passed through an extensive Mahogany plantation area.
- Natural forest relatively high elevation
- Logged areas (quite a while ago) look heavily impacted.
- Looked at unlogged/recently logged area (time and access limited due to impending rain). Very high stocking density; small diameters; low canopy.
- Contractor claimed to be getting around 100 to 120 cu.m./ha. Seems very high; didn't really get into the active logging area so couldn't evaluate impact.
- General terrain conditions very broken/steep so a large part of the area cannot be accessed. Ridge top access and logging using Cat D6 with 40 m cable and winch.

GIZ office to drop of contract and discuss the workshop.

Friday 28th September

Meeting with Fiji Hardwood Corporation Ltd., Mr.Simione Sigaca and staff

- Fiji Hardwood Corporation Ltd. (FHCL) is a state corporation which has the monopoly on the management, harvesting, reforestation and sale of Mahogany from government lease lands (99 year lease). This represents about 99% of all Mahogany plantations in Fiji.
- Concerns about various aspects of the Code ie. tree marking, buffer zones; need to exclude areas of sensitive soils
- +/-42,000 ha of Mahogany established by Forestry Department some 35-40 years ago as a rehabilitation effort of heavily logged over natural forests.
- Approximately 10,000 ha of other species and another 20,000 ha earmarked for plantation establishment.
- Mahogany logging started in 2002/03 and managed on a 35 year rotation
- Utilization standard 25cm top diam and minimum 2.1m length.
- Using D6 and rubber tired skidders
- 200-300 ha logged /year

Meeting with Fiji Mahogany Trust, Mr. Sekope Bula

- Fiji Mahogany Trust (FMT) is an NGO set up to represent the landowner interests on Mahogany plantation areas.
- Sustainable Mahogany Industries (SMI) is a very politically connected processing industry (Attorney General level). Has been granted a quota of 40,000 cu.m. of Grade 1 and 2 Mahogany logs (5 grades) at $300/cu.m.). Reputed to be able to influence actions of the FHCL to a large extent ie. change its logging plan, operate outside the Code, etc.
- SMI has a large contract to supply Gibsons Guitars
- Discussions focused on the legal/political ramification visa vi the 'Mahogany Industry (Licensing and Branding) Decree 2011 (Decree No. 53)
    - Forest Decree 1992
    - Mahogany Industry Development Decree 2010 (Decree No.16)

- Set up Mahogany Industry Council (Prime Minister, Attorney General, Minister of Forests, Chair of Fiji Mahogany Trust, one more . . .)
- Places the management of the country's Mahogany forests under the Ministry of Public Enterprises (Takes the management of the countries mahogany forests out of the jurisdiction of the Department of Forests)
- Defined role of Fiji Mahogany Trust
- Established Fiji Hardwood Corporation Ltd.
- Role is to regulate FHCL and the Fiji Mahogany Trust

- **Mahogany Industry (Licensing and Branding) Decree 2011** (Decree No. 53) – creates a monopoly covering the entire Fiji Mahogany industry.
  - Supersedes the Mahogany Industry Development Decree
  - Takes the Dept. of Forests completely out of the loop as far as management and regulation of Mahogany forests is concerned.
  - Certificate of legality
  - Grant licenses to purchase mahogany from FHCL with respect to quality, quantity, etc. for licensing fee + $25 reforestation fee to FHCL

Field visit to Nakurua Station (FHCL) NVD 014 Compartment, Mahogany logging area

- Inspected area partly logged: lots of 'avoidable' waste; trees left behind; streams chocked with debri; hung up trees;
- FHCL policy is to plant after 2 years after logging (saw line clearing being done in preparation for planting). 7x4m spacing = 357 trees/ha (used to be 9x4m = 278 trees/ha.
- Discussed maps/photos etc. Apparently the FHCL had 1:10,000 scale aerial photography done for the 4 most mature plantation areas. The product is understood to be a photo mosaic at 1:10,000. Contour and forest type maps were not requisitioned from the foreign contractor.

Debriefing at the office of the DFO Southern in Nauisori

- Discussion with John Rawasoi, Asst. DFO
- Southern includes Central and Eastern Districts (Maratime Provinces)

Saturday 29th September

Working on workshop presentation/power point.

Sunday 30th September

Fly Suva to Savusavu on Vanu Levu and then drive across the island to Labasa.

Monday, 1st October

Meeting with DFO Northern

- General responsibilities include forest harvesting, extension, reforestation and utilization licensing.
- 8 mills and 4 portable sawmills
- Harvesting organized under 8 beats for the entire district
- Issues: logistics and transport difficulties including fuel allocation.

Meeting with Valebasoga Tropic Boards (VTB), Mr. Muktar Ali

- VTB is a private sector forest industry located in Labasa consisting of a plymill and sawmill as well as a logging division.
- Roundwood requirement is approx. 200 cu.m./day (+/-10,000 cu.m./yr.)
- Industrial output is approx 80% plywood (native logs) and 20% sawnwood.
- Company runs three logging operations on its own short-term (annual) license areas in the native forest but also buys logs from other license holders as well as a small quantity of pine logs.
- Plymill input consists of one rotary lathe and one spindeless lathe; result is that recovery rate is around 75%
- Three logging areas are in 5 year license agreement with landowners negotiated through the Itaukei Land Trust Board (ITLTB)
- Issues: "… it takes too long to approve the Environmental Resource Assessmmnet." (ie. 6 months; company hires consultant; to Dept of Environment; sent to Dept of Forests; submission of logging plan)
- Issues: Overloading – want to transport 20 cu.m./truck load but are restricted to 16-17 cu.m. . . . . cost factor

Meeting with Waigele Sawmill, Mr. Ahmed Begg

- Native wood and pine sawmill
- Log input 200-250 cu.m./week from native forest; 150 cu.m./week from pine plus, log sales from other license holders.
- 70% export: rough sawn, kiln dried, treated
- Operates 4 native logging licenses from long term (15year) licenses plus 2 pine licenses.
- +/- 5,000 ha in long term license encompassing 5 land owners.
- Roughly 25 years of virgin forest left in long term license; current licenses in previously logged areas
- +/- 80 cu.m./ha from virgin areas and +/-20 cu.m. from logged over areas
- scaling done in mill yard because this is a long term license.
- Slope concerns – steep terrain plus, recent wetter than usual weather means constraint of effective logging period to approx 3 months / year.

Meeting with Fiji Forest Industries, Mr. Joni Duikoro

- Division of Fiji Pine Group; situated at Malau.
- Originally owned by Westfire of Australia established +/-60 years ago; sold to government and then privatized.
- Long term license (20 years) involving 72 land owners with the bulk of the license areas located in the SE of the island; long haul >200 km.
- FFI pioneer on the north island and responsible for most the road system.
- 5-10,000 cu.m./year from the native forests plus log purchases plus pine and Kadamba
- Logging done by contract private sector contractors; FFI does the planning and license applications
- Issue: all machinery is very old; company needs to reinvest.
- Issue: importance of riparian protection; Code is important and a good thing
- Training (provide by the Forest Dept) is crucial to implementation of the code.
- Need better enforcement and objective evaluation.

Tuesday 2nd October

Field visit to one of FFI logging operations

- Low elevation degraded and poor quality native forest adjacent to pine plantations
- Road access is little more than a track with no thought to alignment or long term use – definitely a fair weather track only.
- Watched felling and skidding operation
- Generally small and poorly formed trees; overall forest condition shows signs of shifting cultivation; good soil conditions for agriculture and high risk of colonization by invasive species and lianas
- Utilization standard is good; chance of directional felling negligible to non-existent
- Skid trail not planned in advance (progressive); very steep (>40%)
- Operator has no assurance of continuing operations in subsequent years in this area.
- Also visited extensive pine plantations and pine chipping facility.

Wednesday, 3rd October

Fly back to Savu from Savusavu and meeting at FTC to discuss preparation and content of tomorrows workshop.

Thursday, 4th October

- National RIL Consultation Workshop chaired by GIZ.

- Presentation by Mr. Samuela Lagataki, Conservator of Forests, reviewing the history of the Code.
- General presentation on RIL (Klassen)
- Specific presentation on RIL and the Code (Klassen) followed by questions and discussions.

Friday, 5th October

Depart Suva for Aukland, NZ … etc.

Awk/field notes.