

DRAFT

Standardisation of Monitoring, Assessment and Reporting (MAR)  
for Sustainable Forest Management in the Pacific

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**Results of MAR-Workshop (November 18, Nadi, Fiji) and  
Further Steps towards a Harmonised MAR-System on SFM  
in the Pacific Island Countries**

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for

SPC

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## Abstract

For sound forestry development and environmental preservation the Pacific Island countries (PICs) supported by SPC and FAO intend to develop harmonized and effective monitoring, assessment and reporting systems (MAR) on forests and forestry.

As a first step a questionnaire was distributed to determine the availability and the importance of the MAR relevant criteria for the PICs. Main result of the questionnaire was a list of criteria defining a "least common denominator" on forest related information important for all PICs and as basis for a harmonised MAR system. As further steps towards a MAR network it was recommended to

- verify the most important results of the study by carrying out an evaluation visit;
- establish a MAR coordination set-up;
- agree on a concrete joint MAR design;
- identify country specific capacity restrictions and needs;
- establish a regional expert pool as task force;
- provide region wide high tech equipment and sophisticated expertise through a qualified partner institution.

According to the recommendations it was the purpose of this consultancy to

- undertake visits in Fiji, PNG and Solomon Islands verifying gaps in their data systems as well as human and technical resources that may be available in assisting other countries;
- discuss with relevant stakeholders the proposed steps towards a Pacific MAR network;
- present the results of the visits to the Pacific MAR workshop (Nov. 17-18, Nadi, Fiji).

The verification visits were carried out in Fiji, PNG and Solomon Islands. The information provided in the questionnaire was largely confirmed. Beside the lack of most of the MAR relevant data (esp. in PNG, Solomon Islands) the main problems are the monitoring work in the field and the data transfer from the field.

During the workshop the findings of the MAR survey and the verification visits were presented and discussed. The expected achievements were fully reached:

- **Network set-up:** 8 out of 11 national coordinators were confirmed (3 still need to be confirmed). For the time being SPC will be in charge as regional coordinator. The MAR network communication platform shall be open to experts only. For the technical layout of the platform design as well as for the development of a data base containing regional experts in MAR-related fields Dr. Wolf Forstreuter offered his support.
- **List of MAR-relevant criteria:** A criteria list representing a *least common denominator* for all PICs was agreed.
- **Regional partner institution for technical assistance:** All participants support the proposal to ask SOPAC for technical assistance in the field of remote sensing and GIS related activities. The SOPAC representative saw no principal problems as long as the support is within the official tasks of SOPAC. Further discussions between SPC and SOPAC might be necessary to clarify details.

### As next steps towards a MAR network it is recommended:

1. Final confirmation of the three not yet confirmed national coordinators;
2. Design of an internet platform as electronic communication network ;
3. Design of a data base on regional experts in MAR related fields as basis of a regional expert pool as task force;
4. Collecting of CV's of regional experts;
5. Identifying or development of adapted and cost-effective methodologies for monitoring, assessment and reporting of the agreed criteria;
6. A first set of (most important) methodologies shall be demonstrated and discussed during a regional workshop;
7. Each country has to identify their restrictions concerning human, technical and financial resources. On this basis, specific support measures might be developed.

## 1. Introduction

The Pacific Island countries are implementing measures to manage their forests for sound forestry development and environmental preservation. An important component of sustainable forest management (SFM) is having up-to-date and accurate information about forests and forestry. Therefore an effective monitoring, assessment and reporting system (MAR) is necessary. Due to a lack of adequate (personnel, technical, financial) resources the information required for making qualified decisions is only partly available in the different Pacific Island countries.

During a FAO/SPC implemented Pacific MAR workshop in October 2007 it was recommended to develop a long-term umbrella plan for the participating Pacific Island countries (LUPP) containing broad guidelines on cost-effective and harmonised methodologies for generation, preservation, reporting, use, and dissemination of information that is flexible enough to address country specific needs<sup>1</sup>.

As a first activity supporting a MAR development a questionnaire based on the criteria of the FAO driven Global Forest Resource Assessment (GFRA) process was elaborated and distributed by SPC in May 2008. Goal of the questionnaire survey was (i) to determine the type of information that is already available, as well as the importance of this information to the countries. For possible contrasts between the importance and availability (ii) possible measures should be determined to fill these gaps. Finally, (iii) further steps towards a MAR network for the Pacific should be recommended.

The resulting report on the Status of Forest Data in Selected Pacific Island Countries<sup>2</sup> states that

- the level of contrast between the availability and importance of information differs between countries and criteria. Regarding the criteria it becomes obvious that there are rather small differences among “classical” forestry information (e.g. forest extent, ownership, growing stock) but very large differences are visible for more “modern” aspects of forestry (e.g. carbon stock, NTFP utilisation, other wooded land issues).
- For all countries significant gaps regarding the availability of relevant information are identified. Some countries have good experience and expertise in certain fields and might assist other countries in the region. Yet, for other fields/criteria an insufficient level of expertise is available in all countries and external support is required.
- Taking into consideration the limited resources in the respective countries, the fact that not all criteria have the same importance for all countries as well as the goal of a joint regional MAR system design, a priority list is developed. The first two criteria groups of the list could be used as a “least common denominator” of important forest related information as a basis for a joint MAR system. The third criteria group contains optional criteria for the country specific needs.

As further steps towards a MAR network it was recommended to

1. verify the most important results of the study by carrying out an evaluation visit
2. establish a MAR coordination set-up
3. agree on a concrete joint MAR design
4. identify country specific capacity restrictions and needs
5. establish a regional expert pool as task force
6. provide region wide high tech equipment and sophisticated expertise through a qualified partner institution.

A more detailed description of the recommended further steps is attached as Annex 1.

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<sup>1</sup> Draft conclusion/recommendations of the workshop (suggested). Nadi, Fiji, 10-12 October 2007

<sup>2</sup> Mussong, M. 2008: Survey on the Status of Forest Data in Selected Pacific Island Countries. Report for SPC.

## **2. Objectives and TOR**

According to the given recommendations it was decided by SPC to undertake a verification of the main results of the questionnaire survey, especially on their supposed experience and expertise of certain countries regarding important MAR relevant criteria, and to develop further steps towards a Pacific network.

The specific tasks of the consultancy were to:

- undertake visits in Fiji, PNG and Solomon Islands verifying gaps in their data systems, etc., and also human and technical resources that may be available in assisting other countries;
- discuss with relevant stakeholders the proposed steps towards a Pacific MAR network and a long-term umbrella plan for the Pacific;
- present the results of the visits to the Pacific MAR workshop to be held in Nadi, Fiji, from 17-18 November 2008, and guide discussions regarding the various findings and recommendations presented;
- consolidate the outcomes of the discussion into a report.

## **3. Verification Visits**

### **3.1 Methodology**

Verification visits were carried out in Fiji (November 4-7), PNG (November 9-11), and Solomon Islands (November 12-14)<sup>3</sup>. Due to restrictions in flight connections and limited time resources the other proposed countries (Samoa, Tuvalu, Niue) could not be taken into consideration.

As basic methodology a structured interview following a prepared interview guide (cf. Annex 3) was carried out with the appointed national MAR coordinator/focal point. After introducing the interviewer and the goal of the interview specifications about the interview partner (educational and professional background, MAR-related experiences, etc.) and his institution/unit (organisational structure, tasks, human and technical resources, MAR relevant experiences, etc.) were asked. After that the relevance of MAR and gaps in the relevant data as well as experience and expertise stated in the questionnaire were discussed. Finally, own ideas of the interview partner regarding MAR and his opinion on the proposed steps towards a harmonised MAR system were recorded. During the interview other potential stakeholders for further discussions were identified and, if available, later on interviewed. A list of all persons met during the verification visit is attached under Annex 4.

### **3.2 Fiji**

The appointed MAR coordinator has more than 10 years of experience in monitoring, assessment and reporting within the Management Services Division of the Fiji Forestry Department and as Acting Deputy Conservator (Services). The Management Services Division as potential MAR institution has carried out two National Forest Inventories since 1991, has permanent and trained staff (approx. 10) on all levels and in the main MAR-relevant fields as well as up-to-date equipment and software for analysing, mapping and storing of MAR-relevant data<sup>4</sup>. Gaps are mainly visible for social and socio-economic aspects

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<sup>3</sup> the detailed schedule of the consultancy mission is attached as Annex 2

<sup>4</sup> also confirmed by SPOAC

like landowner involvement, NTFP and agro-forestry but also in carbon-related aspects. Technical co-operation among the countries is supported and already practised (e.g. GIS support for Niue NFI). Regarding the network building it is proposed that SPC should take the lead but due to poor practicability of the current forest policy network (PAPFNet)<sup>5</sup> a separate communication platform should be installed. The idea of a regional MAR and forest research institution is supported.

### 3.3 PNG

The current MAR coordinator has more than 15 years experience in forest inventory and planning but will leave his position (Acting Director Planning) in the forest administration end of the year; his successor was not available during the visit. Due to a restructuring of the administration the upcoming structure of the current directorate remains unclear. Staff and equipment in the current Planning Directorate seem to be appropriate for MAR. The big gaps regarding actual data indicated in the questionnaire were confirmed. Partly the data are outdated, partly existing actual data are not forwarded from other directorates to the Planning Directorate, partly relevant data exist only outside the forestry administration (Department of Environment<sup>6</sup>, University, Forest Research Institute) and partly MAR-relevant data do not exist at all. The interview partner pointed out that a functioning intra network in PNG would be a pre-condition for a regional MAR network.

### 3.4 Solomon Islands

The interviewed MAR coordinator<sup>7</sup> has 14 years experience in the Planning Division of the Forest Administration, mainly in GIS but also in forest inventory. The Forestry Administration undertakes currently a restructuring process and from 2009 on the Forest Resource Management and Technical Services Division will increase the number of staff from currently 3 only to 5. The tasks will be policy planning, inventory, survey and mapping as well as technical services and enforcement. Equipment and technical resources are available and functioning but an application for modern equipment is forwarded to the EU office. On provincial level some MAR relevant data (mainly wood and NTFP removals) are collected and forwarded as hard copies. The significant gaps in the available data (e.g. environmental aspects, carbon, plantations) should be covered with a new NFI (no funding is currently available) but also through improved monitoring measures on provincial level (forestry offices). The interview partner supports a regional MAR network sharing regional expertise and also the proposal of a joint MAR and research institution for the South Pacific is supported.

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<sup>5</sup> according to different interviewed persons the internet platform of the Pacific Agriculture and Forest Policy Network (PAPFNet; <http://www.spc.int/PAFPNet/>) is not (yet) working. Introduced already in 2006 the network is not very much known, difficult to access ("hidden" on the SPC LRD homepage) and not systematically maintained.

<sup>6</sup> a visit at the Conservation Division, Department of Environment & Conservation, led to the conclusion that no systematic environmental monitoring is carried out (except on alligators).

<sup>7</sup> during the interview the newly appointed Head of Division was also present. Separate discussions were held with the Under Secretary (Technical), Ministry of Forestry, the Commissioner of Forest and two permanent Australian consultants.

## 4. MAR Workshop

### 4.1 Schedule

The workshop took place at Nadi on November 17 and 18. During the first day the FAO representative presented the “Asia-Pacific MAR Project Mid-Term Review”, the “Outcomes of the Kuala Lumpur MAR Workshop” and the current status of the “Regional MAR Network”. The representative from SOPAC informed about a “Possible Support for Pacific MAR”. After that all countries gave a short briefing about their related activities since the last workshop in October 2007.

The second day focuses on the results of the “Survey on the Status of Forest Data in Selected Pacific Island Countries”. After the presentation and the following discussion the expected achievements of the second part of the workshop were introduced. The following session dealt with the findings of the verification visits. After presenting, two relevant topics (problems of monitoring work in the field and data transfer) were more deeply discussed during group work (two groups: smaller – bigger islands) and plenary session. In a final session the five further steps towards a regional MAR network were presented, discussed and finally agreed.

### 4.2 Presentation on MAR-Survey

The presentation (PowerPoint) was structured in Introduction, Objectives, Questionnaire, Rate of Return and Formal Quality, Availability and Importance of Information, Identified Gaps and Possible Actions, Steps Towards a MAR Network, and Summary. The summary shall be introduced here whereas the full presentation is attached as Annex 5.

Summary: The overall goal of the project is to develop a harmonized MAR system for the PIC. The goal of the actual study is to determine the availability and the importance of MAR relevant data by distributing and analysing a FRA criteria-orientated questionnaire. Further steps towards a MAR network shall be recommended.

As main results of the study it becomes evident that for all countries gaps in relevant information are identified but the level of contrast between availability and importance differs between countries and criteria. Some countries seem to have good experience and expertise regarding certain criteria and may assist other countries; for some criteria no regional expertise is available. As a first step towards a harmonised MAR system a priority list on relevant criteria is developed as a “*least common denominator*”. Further steps towards a MAR network are recommended.

### 4.3 Expected achievements of the workshop (second day)

Regarding the recommended six steps towards a MAR network (c.f. chap. 1 and Annex 1) the following achievements were expected:

**Achievement 1** (Step 2: Establishment of a MAR coordination set-up):

- (1.1) National coordinators/focal points as well as a regional/central coordinator shall be appointed.
- (1.2) A basic understanding about the network layout and communication structure within the network shall be achieved.

**Achievement 2** (Step 3: Agreement on a concrete joint MAR design):

- A list of MAR relevant criteria shall be agreed by all participating countries as a “least common denominator” for further development of a MAR system.

**Achievement 3** (Step 6: Providing region wide high tech equipment and sophisticated expertise through a qualified partner institution):

- A regional partner institution shall be identified

All other steps shall be discussed for updating the further measures under the action plan but no final agreement is expected during the workshop.

#### **4.4 Presentation on verification visits**

The most important results of the verification visits presented as a PowerPoint slide (cf. Annex 6) can be summarized as follows:

The visits were carried out in three countries (Fiji, PNG, Solomon Islands). The information provided in the questionnaire by the three countries are largely confirmed regarding the availability of data and the technical and human resources available (improvement partly needed) for data analysing, storing, reporting. Beside the lack of most of the MAR relevant data (especially in PNG and Solomon Islands) the main problems are identified concerning the monitoring work in the field and the data transfer in the same and between different administrations.

### **5. Workshop Results**

#### **5.1 Achievement 1: Network set-up**

The MAR network shall include the three elements coordination, communication platform and expert data base. Regarding all elements of the network set-up the expected achievements were fully reached:

During the workshop eight out of eleven national coordinators/focal points were confirmed (2 preliminary confirmed) and three still need to be confirmed (cf. Annex 7). For the time being SPC will be responsible as regional coordinator (Sairusi Bulai).

It was agreed that the MAR network communication platform should not be a public platform like the PAPFNet. The network shall be an expert network only with a limited number of members. For the technical layout of the platform design Dr. Wolf Forstreuter offered his support.

The development of a data base containing regional experts in MAR-related fields will also be supported by Dr. Forstreuter. To collect a large number of expert profiles personal contacts and communication with local/regional experts might be the main source. In addition a public announcement for regional experts might be taken into consideration. It is proposed to collect the relevant data through a structured questionnaire. The data base structure should allow a systematic search with keywords and filter commands. Scanned CV's might be added in the data base.

#### **5.2 Achievement 2: List of MAR-relevant criteria**

The developed *least common denominator* criteria list was, after some minor changes, agreed during the workshop. Beside some formal clarifications of the main criteria some categories were added to the list like coconut forests and coconut plantations as own categories under forest extend. Customary owned land was included under forest ownership, other socio-economic benefits under removals from forests, and disturbances from invasive

species under disturbances (Tab. 1)<sup>8</sup>. Finally, the list was sorted according to the relevance of the criteria.

**Table 1:** MAR-criteria list after discussion (**changes from proposed list**; cf. Annex 8)

Forest Extent	Forests Other wooded land Other (agriculture) land with tree cover <b>Coconut forests</b> <b>Coconut plantations</b>
Forest ownership/ <b>management rights</b>	State owned land Private owned land (individuals) <b>Customary owned land</b> Other
<b>Designated</b> forest functions	Production Protection of soil and water Conservation of biodiversity Social and cultural services Multiple purpose
<b>Designated</b> functions of other wooded land	Production Protection of soil and water Conservation of biodiversity Social and cultural services Multiple purpose
Forest Characteristics	Primary Secondary with natural regeneration Secondary with enrichment plantings Plantations
Diversity	Total number of native tree species Number of tree spec. according to IUCN “red list” <b>(other bio indicators)</b>
Growing stock	Total growing stock Commercial growing stock Growing stock composition
Carbon stock	Total carbon Carbon in above-ground living biomass Carbon in below-ground living biomass Carbon in dead wood Carbon in litter Soil carbon
Biomass stock	Above-ground biomass Below-ground biomass Dead wood biomass
Removals <b>and benefits</b> from forest	Industrial roundwood Woodfuel Other (NTFP) plant products Animal Products <b>Other socio-economic benefits</b>
Disturbances	Disturbance by cyclones Disturbance by fire Disturbance by insects <b>Disturbance by invasive species</b> Other

<sup>8</sup> the proposal to include other bio indicators under diversity was not finally agreed and may need some more discussion. For the time being it is included in the list.

### 5.3 Achievement 3: Regional partner institution for technical assistance

All workshop participants support the proposal to ask SOPAC for technical assistance in the field of remote sensing and GIS related activities. The SOPAC representative sees no principal problems as long as the support is within the core part of the official tasks of SOPAC. However, further discussions between SPC and SOPAC might be necessary to clarify details.

## 6. Recommended next steps towards a MAR network

1. Final confirmation of the national coordinators/focal points from Cook Islands, Palau and PNG

**Implementation:** through regional coordinator (SPC) beginning 2009

2. Design of an internet platform as electronic communication network

**Implementation:** regional coordinator (SPC) with support of Dr. Forstreuter<sup>9</sup> beginning 2009

3. Design of a data base on regional experts in MAR related fields as basis of a regional expert pool as task force

**Implementation:** regional coordinator (SPC) with support of Dr. Forstreuter<sup>9</sup> beginning 2009

4. Collecting of CV's of regional experts through personal contacts and (eventually) through public announcement (including processing and storing in data base).

**Implementation:** regional coordinator (SPC)<sup>9</sup> from beginning 2009 on

5. Identifying or development of adapted and cost-effective methodologies for monitoring, assessment and reporting of the agreed MAR criteria. If necessary the methodologies have to be adapted to the country specific needs but should be kept comparably regarding their results. The outcome of this process should not only be restricted to descriptions of methodologies, but should provide an estimation of necessary resources for each proposed activity as well.

**Implementation:** regional experts from the expert data base as soon as data base in functioning

**Note:** Due to the fact that the establishment of the expert data base will last several month before this also time consuming activity might start, the following procedure is suggested to speed up the process:

The agreed MAR-criteria list shall be ranked according to the relevance of the criteria. For this purpose the list will be distributed to all national coordinators which shall indicate and rank the 10 (20) most important criteria or subcriteria for the

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<sup>9</sup> if Dr. Forstreuter is not available the University of Applied Sciences Eberswalde/Germany (UASE) might assist in this activities

respective country (which may also serve as a first test run of the network). The summarized feed back will result in a priority list of criteria/subcriteria which will determine where to start with methodology identification.

For the most important 5 to 10 criteria/subcriteria a consultant shall be engaged to provide suitable methodologies. This approach may lead on the one hand to short-term results which seem to be important especially in the beginning of the network establishment. On the other hand it could serve as an example for the development of methodologies on other criteria by regional experts.

**Implementation:** (international) consultant as soon as possible, beginning of 2009<sup>10</sup>

6. A first set of (most important) methodologies shall be demonstrated and discussed during a regional workshop

**Implementation:** SPC/FAO, as soon as possible (second half of 2009)

7. After determine criteria and methodologies each country has to identify their restrictions concerning human, technical and financial resources. On this basis, specific support measures might be developed.

**Implementation:** national coordinators with the assistance of the regional coordinator, starting after the workshop

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<sup>10</sup> for criteria short list as well as priority and exemplary methodology development the University of Applied Science Eberswalde (UASE) has offered its assistance

## Annex 1

### Steps toward a MAR network according to the report on Status of Forest Data in Selected Pacific Island Countries<sup>11</sup>

It is recommended to carry out the following activities

#### 1. Verification of the major results of this study

Especially in view of the suggested intra-regional support a verification of the declared experience and expertise seems to be necessary for a solid further development of a Pacific MAR system. This might be done by an evaluation visit of the MAR related persons and institutions. Due to limited financial and time resources it is proposed to focus mainly on the countries with reported good experiences and expertise regarding the more important criteria<sup>12</sup>. The evaluation visit may also promote the following activities.

#### 2. Establishing a MAR coordination set-up

For each country a MAR coordinator needs to be appointed. Forest inventory and/or forest policy experience, good communication skills and direct access to national and international communication lines are required.

A central coordination for the MAR network is necessary which might be hosted by a regional institution (e.g. SPC, SOPAC, USP). It would be desirable if the hosting institution has the possibility to preserve and to analyze the data.

A regional communication platform for the MAR network needs to be developed. It must be assessed whether MAR network can be linked to already existing electronic and conventional networks.

#### 3. Agreement on a concrete joint MAR design

First of all a list of obligatory criteria for all countries and elective criteria for specific country needs should be defined. This could be done on the basis of this report during a workshop with participants (with forest inventory and/or forest policy experience) from all countries.

In a second step, identical or at least comparable and cost-effective methodologies for monitoring, assessment, reporting should be selected or elaborated for all countries. If necessary the methodology has to be adapted to the country specific needs<sup>13</sup>. A single workshop will not cover this task. Either an extensive series of workshops will be necessary or a consultant, after investigating the MAR activities in each country, shall develop a proposal for further discussions. This might reduce the number of workshops. Participants of the workshops shall have MAR or at least forest inventory experience.

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<sup>11</sup> Mussong, M. 2008: Survey on the Status of Forest Data in Selected Pacific Island Countries. Report for SPC.

<sup>12</sup> according to Tab. 2 und Tab. 4 a priority list for evaluation visits would be:

1. Fiji, 2. Samoa, 3. Tuvalu, 4. Niue, 5. Solomon Islands, 6. PNG. Eventually other (atoll) countries which have not taken part in the survey might be taken into consideration.

<sup>13</sup> e.g.: if in a country wood production plays a minor role growing stock may be estimated with a simplified methodology and with less statistical reliability. But the formal output (m<sup>3</sup>/hectare) should be the same in all countries.

The outcome of this process should not only be restricted to a list and descriptions of methodologies, but should provide an estimation of necessary resources for each proposed activity as well.

4. Identification of capacity restrictions and needs

After selecting criteria and methodologies each country has to identify their restrictions concerning human, technical and financial resources. On this basis, specific support measures might be developed with the assistance of the central coordinator.

5. Establishing a regional expert pool as task force

To provide support for all monitoring, assessment and reporting activities a task force of regional experts shall be established. The CV of all interested experts might be stored in a systematic developed data base managed by the central coordinator. In case of request he will be able to offer qualified staff at short notice.

6. Providing high tech equipment and sophisticated expertise through a qualified partner institution

For tasks where local or regional expertise or special equipment (e.g. for remote sensing) is not available within the countries administrations a qualified external institution will be necessary to provide support on demand. An ideal partner for this role seems to be SOPAC.

## **Annex 2**

### **Schedule of Consultancy Mission**

Nov. 1	Departure Germany
Nov. 3	Arrival Fiji
Nov. 4	Briefing with SPC/Sairusi Bulai
Nov. 4-6	Verification visit at Fiji Forestry Department/Samuella Lagataki Further discussions with Cenon Pandolina/SPC, Inoke Ratukalou/SPC, Dr. Wolf Forstreuter/SPOAC, Prof. Dr. Bill Aalbersberg/IAS/USP
Nov. 7	Departure Fiji, Arrival PNG
Nov. 8-9	Weekend; Report writing, preparation workshop
Nov. 10-11	Verification visit to PNG Forest Planning Division/Vitus Ambra and staff Further discussion with Central Provincial Administration and Conservation Division, PNG Department of Environment and Conservation
Nov. 12	Departure PNG, Arrival Solomon Islands
Nov. 12-14	Verification Visit to Solomon Islands Ministry of Forestry, Forest Resource Management and Technical Services Division Further discussions with AusAID Forestry Management Project II
Nov. 14	Departure Solomon Islands, Arrival Fiji
Nov. 15-16	Preparation for MAR workshop
Nov. 17-18	MAR workshop
Nov. 19-21	Participating FRA workshop
Nov. 22-23	Report writing
Nov. 24	Departure Fiji
Nov. 25	Arrival Germany

## Annex 3

### MAR interview guide

0. Introduction of interviewer and goal of interview
  - to develop a joint/harmonised MAR system for the Pacific Island countries
  - questionnaire on availability and importance of relevant information
  - next step to verify the results (experiences and gaps in data system)
  - to find out who can assist other countries
  - which external input is required
  - etc.
1. Interview partner
  - Name
  - educational and professional background
  - current position
  - years in current position
  - experience (years) in
    - monitoring (field work)
    - scientific analysing/assessment
    - reporting
  - MAR coordinator?
2. Institution of the interview partner and/or (potential) MAR institution
  - Name
  - position within administration
  - tasks/responsibilities
  - experience in data collection, analysing, storing, reporting
  - regular reporting (to whom? Ministry, Bureau of Statistics?)
  - human resources
  - equipment/technical resources
  - other relevant institution (state administration, universities, ...)
3. relevance of MAR
4. gaps in MAR relevant data
5. experience and expertise in certain MAR fields
6. own ideas regarding MAR
7. opinion on
  - network building (acc. to forest policy network?)
  - capacity building through regional experts (task force)
  - capacity building through international experts
  - joint MAR-institution/joint forest monitoring and research centre/joint forest competence centre (monitoring/research/education)
  - other

## **Annex 4**

### **Persons met during the verification visits**

#### **Fiji**

- Samuela Lagataki, Acting Deputy Conservator (Services) of Forests, Fiji Forestry Department
- Dr. Wolf Forstreuter, SPOAC
- Prof. Dr. Bill Aalbersberg, Institute of Applied Sciences (IAS), University of South Pacific (USP)
- Inoke Ratukalou, Land Use and Resource Policy Advisor, Land Resource Division, SPC
- Cenon Padolina, Land Resource Division, SPC

#### **PNG**

- Vitus Ambra, Divisional Manager, Forest Planning Division, PNG Forest Authority
- Ledino Saega, Supervisor Inventory, Forest Planning Division
- Geira Gamoga, Supervisor Plans, Forest Planning Division
- Jason Sigamata, Manager, Forest Planning Division
- Martin Golman, Manager, Forest Planning Division
- Cliff Gabi Boutau, Deputy Provincial Administrator Policy, Infrastructure & Corporate Services, Central Provincial Administration
- Chris Kalogo, Manager, Provincial Forest, Central Provincial Administration
- James Sabi, Manager Biodiversity Assessment, Conservation Division, Department of Environment & Conservation

#### **Solomon Islands**

- Gordon Konairamo, Under Secretary (Technical), Ministry of Forestry
- Reeves Moveni, Commissioner of Forest, Ministry of Forestry
- Kedson Ago, Division Head, Forest Resource Management and Technical Services
- Jimmy Irokete Wanefai, Principal Forest Officer PFO, GIS
- Stanley Nenea, Senior Forest Officer
- Peter Baldwin, Technical Assistant to Commissioner of Forest, Forestry Management Project II (AusAID)
- Ross Andrewartha, Team Leader, Forestry Management Project II (AusAID)

**Annex 5**

PowerPoint presentation MAR survey

**Annex 6**

PowerPoint slide on verification visit

**Annex 7:** List of national focal points, regional coordinator and attached persons

Country	Name	e-mail	Telephone	fax	coordinator status
Cook Islands	Mr Nooroa Tokari	noot@agriculture.gov.ck	+682 28711	+682 21881	to be confirmed
FSM	Mr Gibson Susumu (Ms Alissa Takesy)	Gibson.Susumu@dea.fm (fsm_pan@mail.fm)	+691 320 2620	+691 320 5854	confirmed
Fiji Islands	Mr Samuela Lagataki	samuela_lagataki@yahoo.com	+679 3301611	+679 3318692	for the time being
Kiribati	Ms Tearimawa Natake	Tearimawa21@yahoo.com.au	+686 28108		confirmed
Niue	Mr Brandon Tauasi	flex@niue.nu flextauasi@yahoo.com	+683 4032	+683 4079	confirmed
Palau	Ms Tarita Holm	tarita_holm@yahoo.com tarita@palunet.com	+680 488 6654	+680 488 6460	to be confirmed
PNG	Ms Dr Ruth Turia	rturia@pngfa.gov.pg	+675 3277874	+675 3277839	to be confirmed
Samoa	Mr Tony Leutele	tony.leutele@mnre.gov.ws	+677 24215	+677 24660	confirmed
Solomon Islands	Mr Jimmy I Wanefaia	jwirokete@yahoo.com	+677 24215	+677 24660	confirmed
Kingdom of Tonga	Mr Tevita Fakaosi (Mr Heimuli Likiafu)	tevita.fakaosi@mafff.gov.to fakaosi.tevita@yahoo.com	+ 676 29500 + 676 30349	+676 30040	confirmed
Vanuatu	Ms Phyllis Kamasteia	pkamasteia2000@yahoo.com	+628 23171	+628 23856	confirmed until 2009
<b>Regional Coordinator</b>					
SPC	Mr Sairusi Bulai	sairusib@spc.int	+679 3300432	+679 3305212	confirmed
<b>Others</b>					
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## Annex 8:

### Originally proposed criteria table

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Carbon stock	Total carbon Carbon in above-ground living biomass Carbon in below-ground living biomass Carbon in dead wood Carbon in litter Soil carbon
NWFP removal	Plant products Animal Products
Functions of oth. wooded land	Production Protection of soil and water Conservation of biodiversity Social and cultural services Multiple purpose
Forest Extent	Forests other wooded land other (agriculture) land with tree cover
Forest ownership	
Forest functions	Production Protection of soil and water Conservation of biodiversity Social and cultural services Multiple purpose
Characteristics of forests	Primary Secondary with natural regeneration Secondary with enrichment plantings Productive plantations Protective plantations
Growing stock	Total Growing stock Commercial growing stock Growing stock composition
Diversity	Total number of native tree species Number of tree spec. according to IUCN "red list"
Biomass stock	Above-ground biomass Below-ground biomass Dead wood biomass
Disturbances	Disturbance by cyclones Disturbance by fire Disturbance by insects Disturbance by diseases Other disturbances
Wood removal from forests	Industrial roundwood Woodfuel

DRAFT

Standardisation of Monitoring, Assessment and Reporting (MAR)  
for Sustainable Forest Management in the Pacific

-

**Survey on the Status of Forest Data  
in Selected Pacific Island Countries**

September 2008

Michael Mussong

for

SPC

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## Abstract

For sound forestry development and environmental preservation the Pacific Island countries intend to develop harmonized and effective monitoring, assessment and reporting systems (MAR) on forests and forestry.

To support this activity a questionnaire based on the criteria of the FAO driven Global Forest Resource Assessment (GFRA) process was developed. The questionnaire should (i) determine the type of information that is already available, as well as the importance of this information to the countries. For possible contrasts between the importance and availability (ii) possible actions should be determined to fill these gaps. Finally, (iii) further steps towards a MAR network for the Pacific should be recommended.

The feedback and its formal quality from the questionnaires of nine countries are very satisfying. It becomes obvious that for all countries a significantly higher quality of information is needed than is currently available.

The level of contrast between the availability and importance of information differs between countries and criteria. Countries with recent surveys (e.g. National Forest Inventories) have relatively good information available and the contrast to the average importance is reasonable. Some countries have almost no information available and rank the importance of almost all information as very high. Other countries are taking intermediate positions. Regarding the criteria it becomes obvious that there are rather small differences among "classical" forestry information (e.g. forest extent, ownership, growing stock). Very large differences are visible for more "modern" aspects of forestry (e.g. carbon stock, NTFP utilisation, other wooded land issues).

For all countries significant gaps regarding the availability of relevant information are identified. Some countries have good experience and expertise in certain fields and might assist other countries in the region. Yet, for other fields/criteria an insufficient level of expertise is available in all countries and external support is required.

Taking into consideration the limited resources in the respective countries, the fact that not all criteria have the same importance for all countries as well as the goal of a joint regional MAR system design, a priority list is developed. The first two criteria groups of the list could be used as a "least common denominator" of important forest related information as a basis for a joint MAR system. The third criteria group contains optional criteria for the country specific needs.

As further steps towards a MAR network it is recommended to

1. verify the most important results of the study by carrying out an evaluation visit
2. establish a MAR coordination set-up
3. agree on a concrete joint MAR design
4. identify country specific capacity restrictions and needs
5. establish a regional expert pool as task force
6. provide region wide high tech equipment and sophisticated expertise through a qualified partner institution.

## 1. Introduction

The Pacific Island countries are implementing measures to manage their forests for sound forestry development and environmental preservation. An important component of sustainable forest management (SFM) is having up-to-date and accurate information about forests and forestry. Therefore an effective monitoring, assessment and reporting system (MAR) is necessary. Due to a lack of adequate (personnel, technical, financial) resources the information required for making qualified decisions is only partly available in the different Pacific Island countries.

A questionnaire distributed by FAO in August 2007, attempting to investigate the current status of MAR systems in the Pacific countries, brought no clear picture<sup>1 2</sup>. On the one hand the feedback from a total of 8 countries<sup>3</sup> confirmed the expected highly diverse situation. For example the results included countries with little to no forest related MAR, countries with outdated NFI<sup>4</sup> or other forest inventories (based in some cases on 15 to 30 year old information), and even some countries with very current NFI or other relevant data. On the other hand, formal problems, such as misunderstood questions, unclear answers, contradictions, etc. left doubts about the reliability of the investigation's outcome<sup>2</sup>.

In light of the countries sharing expertise and resources, a regional approach might be an attractive option to provide support for effective monitoring, assessment and reporting of forestry related information in these specific countries.

During a FAO/SPC implemented Pacific MAR workshop (Nadi, Fiji, Oct. 10-12 2007) it was recommended to develop a long-term umbrella plan for the Pacific countries (LUPP) containing broad guidelines on cost-effective and harmonised methodologies for generation, preservation, reporting, use, and dissemination of information that is flexible enough to address country specific needs<sup>5</sup>.

One aspect under the intended LUPP was the further recommendation to "set up a regional network on MAR-SFM among the Pacific countries and collaboration organizations to establish well-harmonised and regionally accommodated MAR-SFM systems by sharing updated experiences, expertise and knowledge of MAR and formalizing the LUPP among the Pacific countries"<sup>6</sup>. More specifically, the following activities were agreed upon:

- (i) Study of MAR-SFM systems in Pacific countries
  - a. Review of current systems
  - b. Suggestions for future development and harmonisation (action plan)
- (ii) Elaboration of a draft Long-term Umbrella Plan on MAR for Pacific countries (LUPP)
  - a. Study of country needs for the development of MAR
  - b. Identification of potential resources for the LUPP
  - c. Drafting and revision of the LUPP with the countries
- (iii) Development of regional network on MAR
  - a. Assessment of existing electronic and conventional networks for forestry and forest resource assessments in the Pacific
  - b. Study of FAO networks for MAR and forest resource assessments
  - c. Proposal for designing a regional network for Pacific countries
- (iv) National focal points meeting to discuss and endorse the findings and recommendations of the studies on MAR-SFM and regional network

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<sup>1</sup> Otsuka, M., 2007: Analysis of questionnaires on MAR. PowerPoint presentation, FAO, Bangkok

<sup>2</sup> Mussong, M., 2008: MAR-Project - Analyzing Questionnaires Otsuka. Int. paper for SPC, unpubl., 2 p.

<sup>3</sup> Countries: Fiji, FSM, Kiribati, PNG, Samoa, Solomon Islands, Tonga, Vanuatu

<sup>4</sup> National Forest Inventory

<sup>5</sup> Draft conclusion/recommendations of the workshop (suggested). Nadi, Fiji, 10-12 October 2007

<sup>6</sup> Annex, Terms of Agreement. MAR-workshop Nadi, Fiji, 10-12 October 2007

## 2. Objectives and TOR

Due to the unsatisfying results of the first survey it was decided to make a second attempt, focussing more on the importance of the information to the respective country. This new survey of the status of forest data in selected Pacific Island countries should:

- determine the type of information available and the importance of the information to the countries;
- determine what the gaps are and the possible actions that need to be taken to fill these gaps;
- determine next steps towards finalising the need for a MAR network for the Pacific and the need for a regional facility to support Pacific Island countries in the continuous improvement and maintenance of their MAR systems.

## 3. Questionnaire

### 3.1 Substantive requirements

Due to the fact that all countries are members of the Global Forest Resource Assessment<sup>7</sup> (GFRA) process it is obvious that a MAR system should provide as much as possible information to GFRA but probably also to other national and international requirements (i.e. CBD, CITES, IPPC etc.).

The GFRA process defines indicators under the following 15 fields (thematic elements)<sup>7</sup>:

- Forest Extent
- Ownership
- Designated functions (forests, other wooded land)
- Characteristics (forests, other wooded land)
- Growing Stock
- Biomass Stock
- Carbon Stock
- Disturbances
- Diversity
- Rowing Stock Composition
- Wood removal
- Value of wood removal
- NTFP
- Value of NTFP
- Employment

The questionnaire (Fig. 1) should cover the thematic elements, with more detailed criteria (in total 58) for each term (according to GFRA). In the first step each country should indicate on criteria level which of the four categories of information quality is available in the country:

(i) high quality and up to date information available, (ii) partly good information available, (iii) information in limited quality available, (iv) no solid information available. In a second step, the importance of the information to the country should be indicated: (i) very important, (ii) important, (iii) less important, (iv) not important. Other available or even missing country relevant criteria should be added to the list. The final components of the questionnaire are five more explanatory questions (a.o. forest and measurement definitions), a check list on which international processes the respective country participates and some space for remarks. The full questionnaire is attached as Annex 1.

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<sup>7</sup> FAO, 2006: Global Forest Resources Assessment 2005 - Progress towards sustainable forest management. FAO Forestry Paper 147, Rome. (<ftp://ftp.fao.org/docrep/fao/008/a0400e/a0400e00.pdf>)

### 3.2 Formal aspects

The following formal criteria are necessary for the questionnaire:

- electronic form
- as short as possible
- clear design
- clear instructions and questions
- easy and quick to complete (preferably per mouse click)

*Questionnaire on standardization of Monitoring, Assessment, and Reporting (MAR) on Sustainable Forest Management in the Pacific region*

Please indicate   the availability and the importance of forest related information for your country. It is **NOT** necessary to fill in concrete figures! If necessary please contact also other experts on forest related national and international processes (c.f. page 5). Thank you for support.

Criteria – 1	Information available for your country				Importance of information for your country			
	yes, in good and actual quality	partly in good quality (i.e. for plantations)	in limited quality	no solid information available	very important	important	less important	not important
<b>Forest Extent (in hectare)</b>								
Forests <sup>1</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
other wooded land	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
other (agriculture) land with tree cover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Forest ownership</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Forest functions</b>								
Production	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Protection of soil and water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conservation of biodiversity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social and cultural services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Multiple purpose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Functions of other wooded land</b>								
Production	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Protection of soil and water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conservation of biodiversity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social and cultural services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Multiple purpose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<sup>1</sup> which forest definition do you use? (please indicate) acc. to FAO  other definition

Figure 1: First page (out of 5) of the distributed questionnaire (full questionnaire see Annex1)

## 4. Rate of Return and Formal Quality

The questionnaire was distributed through SPC among x(??) Pacific Island countries. Nine countries (Cook Islands, Fiji, Niue, PNG, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu) returned the completed questionnaire (8 by e-mail, 1 by fax). The formal quality of the feedback is very satisfying, with more than 95 % of the questions having been answered, (Tab. 1).

With 11%, the Cook Islands had the highest share of unanswered questions. In total, out of all the criteria, 11 of the questions had been left unanswered in more than 10% of the questionnaires. The unanswered questions dealt mostly with carbon issues and social, cultural and socio-economic services (incl. employment and NTFP). It is interesting to note that the question on forest ownership is one of these as well. The question with the lowest answer rate is the use of NTFP animal products (22 %).

For the three (out of 5) explanatory questions which should have been answered by all countries, the answer rate was only 56 %. The final questions concerning the availability of

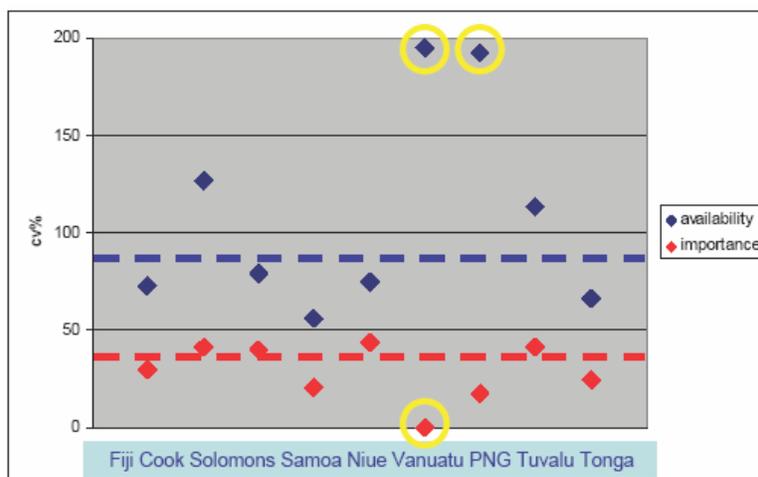
other relevant information and the need for other information, that had not already been mentioned, was even less often answered. Also remarks were rarely made in regards to the questionnaire itself.

Questions asked per questionnaire (58 x 2)	116
Average share of answered questions (%)	95.8
Average share of unanswered questions (%)	4.2
Average share of questions with unclear answers (%)	1.4
Countries with more than 10 % unanswered questions	Cook Islands (11.2%)
Questions which were not answered in >10 % of the cases	<ul style="list-style-type: none"> <li>- forest ownership</li> <li>- social/cultural services of forests</li> <li>- carbon in dead wood</li> <li>- carbon in litter</li> <li>- soil carbon</li> <li>- other disturbances</li> <li>- employment (all 3 questions)</li> <li>- NTFP removal of plant products</li> <li>- NTFP rem. of animal products (22%)</li> </ul>

**Table 1:** Formal quality of the feedback from 9 countries.

The explanatory questions, concerning which forest definition is used, were mostly answered. All countries except Solomon Islands use the FAO definition. Fiji and the Cook Islands did not complete this question. The question on the minimum dbh (in cm) for growing stock and commercial stock was answered by Solomon Islands (30; 60 cm), Vanuatu (60; 60+), PNG (20; 50+) and Tonga (15; 15). Under “other disturbances” the following were mentioned: land slides and tsunamis (Solomon Islands), and volcanic activities (Vanuatu). Concerning the table of international processes, only Fiji (additionally: Ramsar, IPCC) and Vanuatu (additionally: UNFCCC) made some corrections.

The statistical variation of answers within a questionnaire may be used as an indicator for the reliability. If only “extreme” results are found it might be a hint that the person(s) who completed the questionnaire do not have access to differentiated information. Figure 2 shows that most countries are more or less close to the average variation regarding availability and importance of information. For Vanuatu only undifferentiated results appear: (almost) no relevant information is available and all information mentioned in the questionnaire is very important. A little bit less extreme (especially according to the importance) are the answers from PNG.



**Figure 2:** Statistical variation (coefficient of variation) of answers per country regarding availability and importance of forest related information (- - -: arithmetic mean)

## 5. Availability and Importance of the Information

### 5.1 Similarities and Differences between the Countries

Already in Fig. 2 significant differences between the average availability and the average importance become visible. The observation, that the importance of all mentioned information is estimated higher than the availability of this information, holds true for all countries. Figure 3 indicates this result by using an index calculated from the ordinal scaled ratings of the criteria regarding availability or importance<sup>8</sup>.

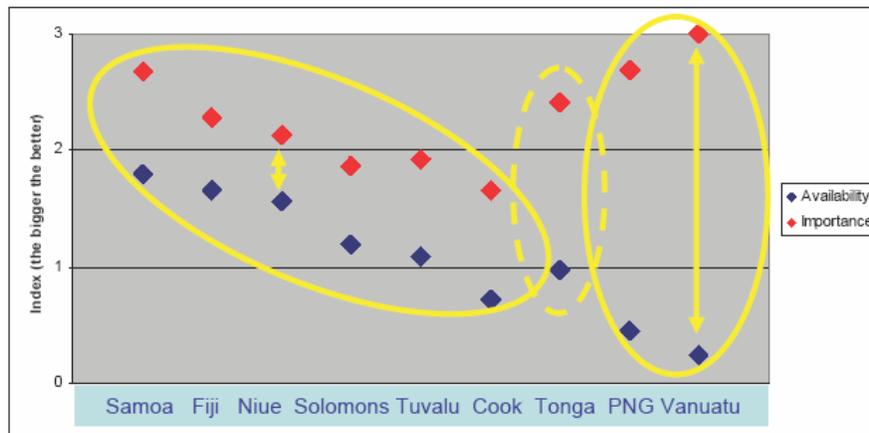


Figure 3: Grouping of countries regarding contrast between availability and importance of information in the respective country

In the largest group of countries the contrast between the importance and the availability are smaller than one index point. Especially for Niue, Fiji and Solomon Islands the average availability comes very close to the average importance. For PNG and Vanuatu the differences are more than 2 index points which confirms the very strong contrast between availability and importance. Tonga represents an intermediate position, showing a moderate difference of approx. 1.5 index points.

Another attempt at a systematic grouping of the countries is shown in Fig. 4.

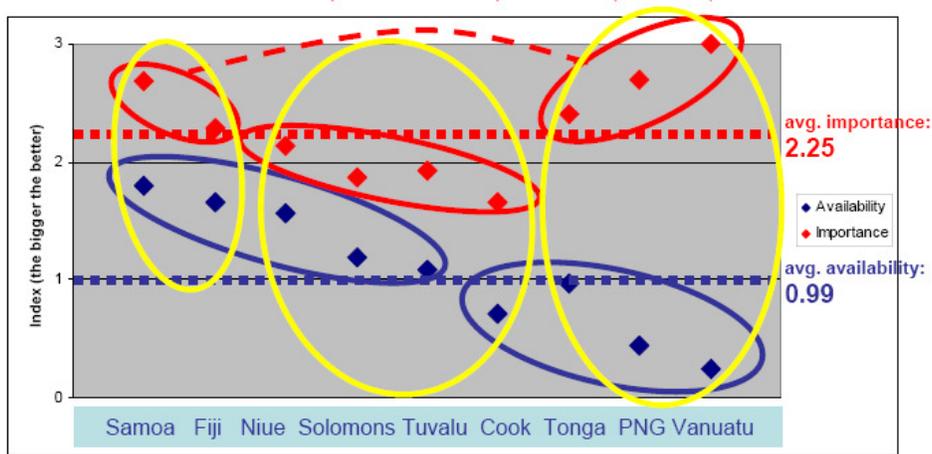
Comparing the average availability and importance of information in the respective country with the average availability and importance of information for all countries, 3 groups become visible:

1. countries with clearly above average availability of information and above average importance: Samoa and Fiji (“motivated group”)
2. countries with (usually) above average availability of information and below average importance: Niue, Solomon Islands, Tuvalu and Cook Islands<sup>9</sup> (“content group”)
3. countries with more or less significant below average availability of information and clearly above average importance: Tonga, PNG and Vanuatu (“ambitious group”)

When comparing the groupings according to Fig. 3 and 4 with the land surface, the forest cover or other country characteristics, there seems to be no clear correlation.

<sup>8</sup> Index: arithmetic mean of all criteria ratings for availability or importance  
3 points: good and actual information available / very important information  
2 points: partly good information available / important information  
1 point: information in limited quality available / less important information  
0 points: no solid information available / not important information

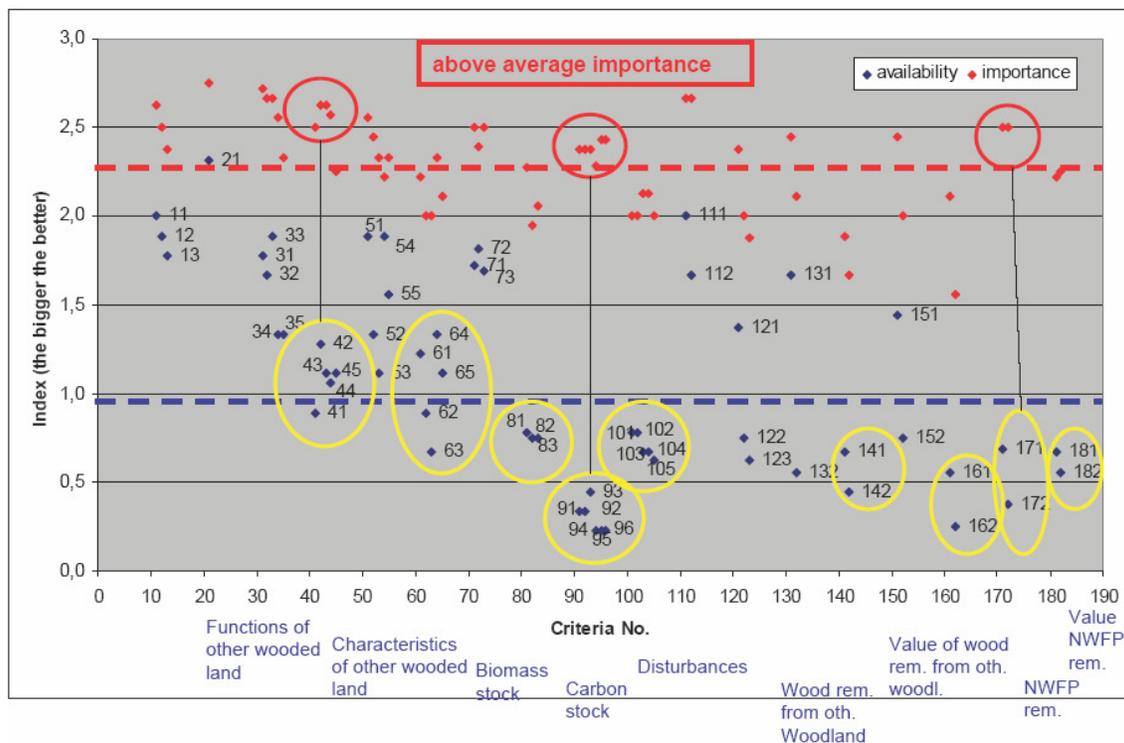
<sup>9</sup> Cook Islands is grouped here as well in spite the fact that it's information availability is below average



**Figure 4:** Grouping of countries with regards to differences between average availability and importance of information in the respective country and in comparison with the average availability and importance of information for all countries

### 5.2 Contrast between Information Availability and Importance within the Criteria Groups

Each GFRA thematic element<sup>10</sup> was subdivided in several criteria<sup>11</sup>. Figure 5 shows the availability and importance of information for each criteria, whereas the indices are calculated as the arithmetic mean from the observations of all countries.



**Figure 5:** Differences (in index points) between availability and importance of information within the criteria groups (--- arithmetic mean; criteria code c.f. Annex 2)

<sup>10</sup> see Chap. 3.1

<sup>11</sup> for the full list of criteria see the Questionnaire (Annex1)

It becomes visible that the biggest contrasts recorded are in regards to the carbon stock criteria. Especially their availability is far below the average. Yet the criteria for NTFP removal and functions of other wooded land also display a strong contrast between availability and importance. Figure 6, indicating the absolute difference of the indices for availability and importance, confirm the observation: the 3 criteria groups with the strongest contrast between availability and importance of information are carbon stock, NTFP removal and value of NTFP removal. The group with moderate differences consists of functions of other wooded land, biomass stock, disturbances, employment, wood removal from other woodland and value of wood removal from other woodland. All other criteria groups display less contrast.

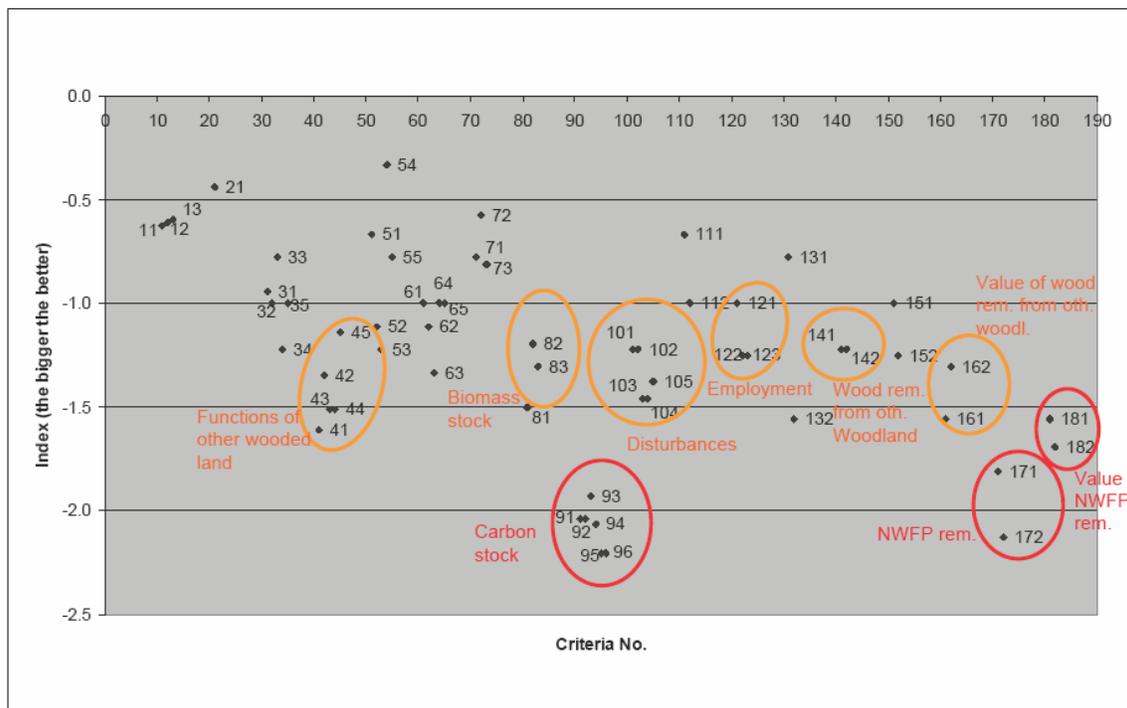


Figure 6: Absolute differences of the criteria indices for availability and importance (criteria code c.f. Annex 2)

### 5.3 Conclusions

The analyzed questionnaires show significant differences between the available information and the estimated importance of the information for sound forestry development and environmental preservations. In all cases of the survey, on country level as well as on criteria level, the importance is ranked higher than the availability which means that there is more qualified information needed than currently available.

The degree of contrast differs between countries and criteria. Countries with recent surveys (Samoa (National Parks), Fiji (NFI), Niue (NFI)) have relatively high level of available information and the contrast to the average importance is reasonable. To the contrary, PNG and Vanuatu have almost no information available and rank the importance of almost all information as very high. The other countries are taking an intermediate position.

Regarding the criteria it becomes obvious that there are rather small differences in “classical” forestry information (like forest extent, ownership, growing stock, diversity). Very large differences are visible for more “modern” aspects of forestry like, first of all, carbon stock and NTFP utilisation. However, biomass stock, other wooded land issues and forest disturbances all show prominent differences as well. The other criteria show an intermediate level of contrast.

In part, there are also large differences within the criteria groups. An extreme example is the criteria group “characteristics of forests”. Here the differences are relatively small for forest plantations and primary forests, but rather large for secondary forests. Similar to this is the situation concerning wood removals. There are small differences regarding industrial wood, but large differences regarding fuel wood removal.

## 6. Identified Gaps and Possible Actions

The survey shows clearly that there is a need for all countries to improve their situation. In all countries significant gaps are identified regarding the availability of relevant information. Some countries have good experience and expertise in certain fields (Tab. 2). But for other fields/criteria experience and available expertise is insufficient in all countries (Tab. 3).

To fill the identified gaps, two measures are possible: If experience and expertise is available in other countries of the region, regional experts and institutions may give support. If no regional experience and expertise is available extra-regional support is required.

Taking into consideration the limited resources in the respective countries, the fact that not all criteria have the same importance for all countries, and the goal of a joint regional MAR system design, a priority list has been developed<sup>12</sup>. In a first step, five logical priority groups are defined (cf. Annex 3). The first group consists of criteria (carbon stock, NTFP removal, and functions of other wooded land) with very high importance and (almost) no regional expertise. For the second group (forest ownership, diversity, forest functions, forest extent, growing stock, characteristics of forests) the relevance is also high, but regional support is available. The third group (wood removal from forests, value of wood removal from forests) has some average importance and requires partially regional and partially external support. The fourth group (characteristics of other woodland, biomass stock, disturbances, employment) has an importance that is clearly below average and also requires partially regional and partially external input. The last group (wood removal from other woodland, value of NTFP removal, value of wood removal from other woodland) has an importance level that is clearly below average as well, but full external support is required here.

To simplify and optimize the priority list, the groups of average or below average criteria importance (III, IV, V) are put together in one group (Tab. 4). The criteria “wood removal from forests” and “disturbances”, both vital for the sustainable management, are moved up to the second group. Also “biomass stock”, because of its close linkage to “carbon stock”, is lifted up to the second group. All other criteria keep their position in group I and II.

The final priority list could be used as a “least common denominator” of important forest related information as a basis for a joint Pacific MAR system:

All criteria of the first and second group should be investigated by all countries. Some countries have already good quality information here and may give, upon demand, support to other countries<sup>13</sup>. The other criteria (priority class III) may be investigated to meet the specific demands of the respective countries.

Bilateral as well as multilateral support is thinkable. Within the region, the support could be manifold, including information exchange, consultations, different measures and intensities of capacity building, equipment and laboratory support, carrying out inventories and other related measures on behalf of other countries etc. Extra-regional support is required for some criteria. To attract international funding and to optimize financial resources, regional activities in training, capacity building and technical support should be preferred.

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<sup>12</sup> on basis of Fig. 5, Tab. 2 and Tab. 3.

<sup>13</sup> Countries which may give support due to their experience and expertise see Tab. 2

Criteria	Criteria code	Good Experience/Expertise
<b>Forest Extent</b>	<b>10</b>	
Forests	11	Fiji, Samoa, Niue
other wooded land	12	Fiji, Samoa, Niue
other (agriculture) land with tree cover	13	Fiji, Samoa, Tuvalu
<b>Forest ownership</b>	<b>21</b>	Fiji, Samoa, Tuvalu
<b>Forest functions</b>	<b>30</b>	
Production	31	Fiji, Samoa, Niue
Protection of soil and water	32	Fiji, Tuvalu
Conservation of biodiversity	33	Fiji, Samoa, Tuvalu
Social and cultural services	34	Tuvalu
Multiple purpose	35	Fiji, Tuvalu
<b>Functions of other wooded land</b>	<b>40</b>	
Protection of soil and water	42	Tuvalu
Conservation of biodiversity	43	Tuvalu
Social and cultural services	44	Tuvalu
Multiple purpose	45	Tuvalu
<b>Characteristics of forests</b>	<b>50</b>	
Primary	51	Fiji, Solomons, Samoa, Niue
Secondary with natural regeneration	52	Niue
Secondary with enrichment plantings	53	Fiji, Niue
Productive plantation	54	Fiji, Samoa, Niue
Protective plantation	55	Fiji, Samoa, Niue
<b>Characteristics of other wooded land</b>	<b>60</b>	
Primary	61	Fiji
Productive plantation	64	Solomons
<b>Growing stock</b>	<b>70</b>	
Total Growing stock	71	Samoa, Niue, (Solomons)
Commercial growing stock	72	Niue, (Solomons)
Growing stock composition	73	Niue, (Solomons)
<b>Biomass stock</b>	<b>80</b>	
Above-ground biomass	81	Niue
Below-ground biomass	82	Niue
Dead wood biomass	83	Niue
<b>Disturbances</b>	<b>100</b>	
Disturbance by cyclones	101	Samoa
Disturbance by insects	103	Tuvalu
Disturbance by diseases	104	Tuvalu
<b>Diversity</b>	<b>110</b>	
Total number of native tree species	111	Fiji, Samoa, PNG
Number of <i>critically endangered, endangered and vulnerable</i> tree spec. according to IUCN "red list"	112	Fiji, Samoa
<b>Employment (number of jobs)</b>	<b>120</b>	
Production of logs, fuelwood, NTFP, ..	121	Fiji, Samoa
Provision of services	122	Samoa
Unspecified forestry activities	123	Samoa
<b>Wood removal from forests (m<sup>3</sup>)</b>	<b>130</b>	
Industrial roundwood	131	Fiji, Solomons, Samoa, PNG
<b>Value of wood removal from forests</b>	<b>150</b>	
Industrial roundwood	151	Fiji, Solomons, Samoa, PNG
Woodfuel	152	Fiji
<b>NWFP removal</b>	<b>170</b>	
Plant products	171	(Solomons)

Tab. 2: Criteria with good experience and expertise in certain Pacific countries

Criteria	Criteria code
<b>Functions of other wooded land</b>	<b>(40)</b>
Production	41
<b>Characteristics of other wooded land</b>	<b>(60)</b>
Secondary with natural regeneration	62
Secondary with enrichment plantings	63
Protective plantation	65
<b>Carbon stock</b>	<b>(90)</b>
Total carbon	91
Carbon in above-ground living biomass	92
Carbon in below-ground living biomass	93
Carbon in dead wood	94
Carbon in litter	95
Soil carbon	96
<b>Disturbances</b>	<b>(100)</b>
Disturbance by fire	102
Other disturbance	105
<b>Wood removal from forests (m<sup>3</sup>)</b>	<b>(130)</b>
Woodfuel	132
<b>Wood removal from other Woodland</b>	<b>(140)</b>
Industrial roundwood	141
Woodfuel	142
<b>Value of wood rem. from other woodland</b>	<b>(160)</b>
Industrial roundwood	161
Woodfuel	162
<b>NWFP removal</b>	<b>(170)</b>
Plant products	171
Animal Products	172
<b>Value of NWFP removal</b>	<b>(180)</b>
Plant products	181
Animal Products	182

Tab. 3: Criteria for which there is no or insufficient experience and expertise in all countries (yellow: criteria evaluated as very important)

Priority	Criteria group	Code	Regional support	External support
<b>I</b>	Carbon stock	<b>90</b>		<b>X</b>
	NWFP removal	<b>170</b>		<b>X</b>
	Functions of other wooded land	<b>40</b>	<b>X (42, 43, 44, 45)</b>	<b>X (41)</b>
<b>II</b>	Forest ownership	<b>21</b>	<b>X</b>	
	Diversity	<b>110</b>	<b>X</b>	
	Forest functions	<b>30</b>	<b>X</b>	
	Forest extent	<b>10</b>	<b>X</b>	
	Growing stock	<b>70</b>	<b>X</b>	
	Characteristics of forests	<b>50</b>	<b>X</b>	
	Biomass stock (from IV)	<b>80</b>	<b>X</b>	
Wood removal from forests (from III)	<b>130</b>	<b>X (131)</b>	<b>X(132)</b>	
Disturbances (from IV)	<b>100</b>	<b>X (101, 103, 104)</b>	<b>X (102, 105)</b>	
<b>III</b> (incl. IV+V)	Value of wood removal from forests	<b>150</b>	<b>X</b>	
	Employment	<b>120</b>	<b>X</b>	
	Characteristics of oth. wooded land	<b>60</b>	<b>X (61, 64)</b>	<b>X (62, 63, 65)</b>
	Wood removal from other woodland	<b>140</b>		<b>X</b>
	Value of NWFP removal	<b>180</b>		<b>X</b>
	Val. of wood rem. from oth. Woodl.	<b>160</b>		<b>X</b>

Tab. 4: Priority list of important criteria for a joint MAR-System (yellow: changes comparing to original priority list)

## 7. Steps toward a MAR network

It is recommended to carry out the following activities<sup>14</sup>

### 1. Verification of the major results of this study

Especially in view of the suggested intra-regional support a verification of the supposed experience and expertise seems to be necessary for the further development of a Pacific MAR system. This might be done by an evaluation visit of the MAR related persons and institutions. Due to limited financial and time resources it is proposed to focus mainly on the countries with reported good experiences and expertise regarding the more important criteria<sup>15</sup>. The evaluation visit may also promote all following activities mentioned in the chapter. The TOR of the proposed evaluation visit is attached as Annex 4.

### 2. Establishing a MAR coordination set-up

For each country a MAR coordinator needs to be appointed<sup>16</sup>. Forest inventory and/or forest policy experience, good communication skills and direct access to national and international communication lines are required.

A central coordination for the MAR network is necessary which might be hosted by a regional institution (e.g. SPC, SOPAC, USP). It would be desirable if the hosting institution has the possibility to preserve and to analyze the data.

A regional communication platform for the MAR network needs to be developed. It must be assessed whether MAR network can be linked to already existing electronic and conventional networks.

### 3. Agreement on a concrete joint MAR design

First of all a list of obligatory criteria for all countries and elective criteria for specific country needs should be defined. This could be done on the basis of this report during a workshop with participants (with forest inventory and/or forest policy experience) from all countries.

In a second step, identical or at least comparable and cost-effective methodologies for monitoring, assessment, reporting should be selected or elaborated for all countries. If necessary the methodology has to be adapted to the country specific needs<sup>17</sup>. A single workshop will not cover this task. Either an extensive series of workshops will be necessary or a consultant, after investigating the MAR activities in each country, shall develop a proposal for further discussions. This might reduce the number of workshops. Participants of the workshops shall have MAR or at least forest inventory experience.

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<sup>14</sup> the recommendations are partly very close to 2.2 Description of Activities, Annex, Terms of Agreement. MAR-workshop Nadi, Fiji, 10-12 October 2007

<sup>15</sup> according to Tab. 2 and Tab. 4 a priority list for a evaluation visits would be:

1. Fiji, 2. Samoa, 3. Tuvalu, 4. Niue, 5. Solomon Islands, 6. PNG. Eventually other (atoll) countries which have not taken part in the survey might be taken into consideration.

<sup>16</sup> if not done already

<sup>17</sup> e.g.: if in a country wood production plays a minor role growing stock may be estimated with a simplified methodology and with less statistical reliability. But the formal output (m<sup>3</sup>/hectare) should be the same in all countries.

The outcome of this process should not only be restricted to a list and descriptions of methodologies, but should provide an estimation of necessary resources for each proposed activity as well.

#### 4. Identification of capacity restrictions and needs

After selecting criteria and methodologies each country has to identify their restrictions concerning human, technical and financial resources. On this basis, specific support measures might be developed with the assistance of the central coordinator.

#### 5. Establishing a regional expert pool as task force

To provide support for all monitoring, assessment and reporting activities a task force of regional experts shall be established. The CV of all interested experts might be stored in a systematic developed data base managed by the central coordinator. In case of request he will be able to offer qualified staff at short notice.

#### 6. Providing high tech equipment and sophisticated expertise through a qualified partner institution

For tasks where local or regional expertise or special equipment (e.g. for remote sensing) is not available within the countries administrations a qualified external institution will be necessary to provide support on demand. An ideal partner for this role seems to be SOPAC.

## Annex 1

Questionnaire on standardization of Monitoring, Assessment, and Reporting (MAR) on Sustainable Forest Management in the Pacific region

Please indicate   the availability and the importance of forest related information for your country. It is **NOT** necessary to fill in concrete figures! If necessary please contact also other experts on forest related national and international processes (c.f. page 5). Thank you for support.

Criteria – 1	Information available for your country				Importance of information for your country			
	yes, in good and actual quality	partly in good quality (i.e. for plantations)	in limited quality	no solid information available	very important	important	less important	not important
<b>Forest Extent (in hectare)</b>								
Forests <sup>1</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
other wooded land	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
other (agriculture) land with tree cover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Forest ownership</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Forest functions</b>								
Production	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Protection of soil and water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conservation of biodiversity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social and cultural services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Multiple purpose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Functions of other wooded land</b>								
Production	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Protection of soil and water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conservation of biodiversity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social and cultural services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Multiple purpose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1 which forest definition do you use? (please indicate) acc. to FAO  other definition

1

Criteria – 2	Information available for your country				Importance of information for your country			
	yes, in good and actual quality	partly in good quality (i.e. for plantations)	in limited quality	no solid information available	very important	important	less important	Not important
<b>Characteristics of forests</b>								
Primary	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Secondary with natural regeneration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Secondary with enrichment plantings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Productive plantation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Protective plantation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Characteristics of other wooded land</b>								
Primary	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Secondary with natural regeneration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Secondary with enrichment plantings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Productive plantation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Protective plantation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Growing stock <sup>2</sup></b>								
Total Growing stock	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Commercial growing stock	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Growing stock composition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Biomass stock (e.g. in metric tons)</b>								
Above-ground biomass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Below-ground biomass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dead wood biomass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2 what is the minimum dbh (diameter at breast height) for growing stock: cm commercial growing stock: cm

2

Criteria – 3	Information available for your country				Importance of information for your country			
	yes, in good and actual quality	partly in good quality (i.e. for plantations)	in limited quality	no solid information available	very important	important	less important	Not important
<b>Carbon stock (e.g. in metric tons)</b>								
Total carbon	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Carbon in above-ground living biomass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Carbon in below-ground living biomass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Carbon in dead wood	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Carbon in litter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Soil carbon	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Disturbances (e.g. in hectare)</b>								
Disturbance by cyclones	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Disturbance by fire	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Disturbance by insects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Disturbance by diseases	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other disturbance <sup>3</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Diversity</b>								
Total number of native tree species	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Number of critically endangered, endangered and vulnerable tree spec. according to IUCN "red list"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Employment (number of jobs)</b>								
Production of logs, fuelwood, NTFP, ..	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Provision of services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unspecified forestry activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3 if relevant please specify "Other disturbances":

3

Criteria – 4	Information available for your country				Importance of information for your country			
	yes, in good and actual quality	partly in good quality (i.e. for plantations)	in limited quality	no solid information available	very important	important	less important	Not important
<b>Wood removal from forests (m<sup>3</sup>)<sup>4</sup></b>								
Industrial roundwood	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Woodfuel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Wood removal from oth. woodland<sup>4</sup></b>								
Industrial roundwood	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Woodfuel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Value of wood removal from forests</b>								
Industrial roundwood	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Woodfuel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Value of wood rem. from oth. woodl.</b>								
Industrial roundwood	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Woodfuel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>NWFP removal</b>								
Plant products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Animal Products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Value of NWFP removal</b>								
Plant products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Animal Products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4 if your unit of measurement is other than m<sup>3</sup> over bark please describe

4

If your country has other forest relevant information in good quality available please specify here:

If your country requires more forest relevant information please specify here:

Your country is joining the following forest related international processes / conventions. Please confirm   or modify the indications for your country. In case that you are not sure please contact the responsible unit / person.

	Fiji	FSM	Kiribati	PNG	Samoa	Solomon	Tonga	Vanuatu
Criteria & Indicators (C&I) / ITTO	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria & Indicators (C&I) / Montreal Process	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Convention on Biological Diversity (CBD)	<input checked="" type="checkbox"/>							
Convention on International Trade in Endangered Species (CITES)	<input checked="" type="checkbox"/>							
Convention on Wetlands of International Importance (Ramsar)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
International Plant Protection Convention (IPPC)	<input checked="" type="checkbox"/>							
International Protocol on Climate Change (IPCC)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					
United Nations Convention on Combat Desertification (UNCCD)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
United Nations Environmental Programme (UNEP)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
United Nations Forum on Forests (UNFF)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
UN Framework Convention on Climate Change (UNFCCC)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Others, please specify								

**Remarks:**

## Annex 2

Criteria	Criteria code
Forest Extent	(10)
Forests	11
other wooded land	12
other (agriculture) land with tree cover	13
Forest ownership	21
Forest functions	(30)
Production	31
Protection of soil and water	32
Conservation of biodiversity	33
Social and cultural services	34
Multiple purpose	35
Functions of other wooded land	(40)
Production	41
Protection of soil and water	42
Conservation of biodiversity	43
Social and cultural services	44
Multiple purpose	45
Characteristics of forests	(50)
Primary	51
Secondary with natural regeneration	52
Secondary with enrichment plantings	53
Productive plantation	54
Protective plantation	55
Characteristics of other wooded land	(60)
Primary	61
Secondary with natural regeneration	62
Secondary with enrichment plantings	63
Productive plantation	64
Protective plantation	65
Growing stock	(70)
Total Growing stock	71
Commercial growing stock	72
Growing stock composition	73
Biomass stock	(80)
Above-ground biomass	81
Below-ground biomass	82
Dead wood biomass	83
Carbon stock	(90)
Total carbon	91
Carbon in above-ground living biomass	92
Carbon in below-ground living biomass	93
Carbon in dead wood	94
Carbon in litter	95
Soil carbon	96
Disturbances	(100)
Disturbance by cyclones	101
Disturbance by fire	102
Disturbance by insects	103
Disturbance by diseases	104
Other disturbance	105
Diversity	(110)
Total number of native tree species	111
Number of <i>critically endangered, endangered and</i>	112
Employment (number of jobs)	(120)
Production of logs, fuelwood, NTFP, ...	121
Provision of services	122
Unspecified forestry activities	123
Wood removal from forests (m <sup>3</sup> )	(130)
Industrial roundwood	131
Woodfuel	132
Wood removal from other Woodland	(140)
Industrial roundwood	141
Woodfuel	142
Value of wood removal from forests	(150)
Industrial roundwood	151
Woodfuel	152
Value of wood rem. from other woodland	(160)
Industrial roundwood	161
Woodfuel	162
NWFP removal	(170)
Plant products	171
Animal Products	172
Value of NWFP removal	(180)
Plant products	181
Animal Products	182

## Annex 3

<b>Priority group</b>	<b>Criteria group</b>	<b>Code</b>	<b>Regional support possible</b>	<b>External support required</b>
<b>I</b>	Carbon stock	<b>90</b>		<b>X</b>
	NTFP removal	<b>170</b>		<b>X</b>
	Functions of other wooded land	<b>40</b>	<b>X (42, 43, 44, 45)</b>	<b>X (41)</b>
<b>II</b>	Forest ownership	<b>21</b>	<b>X</b>	
	Diversity	<b>110</b>	<b>X</b>	
	Forest functions	<b>30</b>	<b>X</b>	
	Forest extent	<b>10</b>	<b>X</b>	
	Growing stock	<b>70</b>	<b>X</b>	
	Characteristics of forests	<b>50</b>	<b>X</b>	
<b>III</b>	Wood removal from forests	<b>130</b>	<b>X (131)</b>	<b>X(132)</b>
	Value of wood removal from forests	<b>150</b>	<b>X</b>	
<b>IV</b>	Characteristics of oth. wooded land	<b>60</b>	<b>X (61, 64)</b>	<b>X (62, 63, 65)</b>
	Biomass stock	<b>80</b>	<b>X</b>	
	Disturbances	<b>100</b>	<b>X (101, 103, 104)</b>	<b>X (102, 105)</b>
	Employment	<b>120</b>	<b>X</b>	
<b>V</b>	Wood removal from other woodland	<b>140</b>		<b>X</b>
	Value of NTFP removal	<b>180</b>		<b>X</b>
	Value of wood removal from other wooded land	<b>160</b>		<b>X</b>

## Annex 4

### TOR-Proposal for Activity 1 (verification of major results))

Consultancy: Standardisation of monitoring, assessment and reporting (MAR) on SFM in the Pacific

To verify the major results of the “Survey on the Status of Forest Data in Selected Pacific Island Countries”, especially the supposed experience and expertise of certain countries regarding important MAR relevant criteria, and to develop further steps towards a Pacific MAR network a consultant shall

- undertake an evaluation visit in several countries focusing mainly on the countries with reported good experiences and expertise regarding the more important MAR criteria. In consultation with the SPC Forest and Trees Adviser relevant countries shall be selected from the elaborated priority list: 1. Fiji, 2. Samoa, 3. Tuvalu, 4. Niue, 5. Solomon Islands, 6. PNG. Eventually other (especially atoll) countries which have not taken part in the survey might be taken into consideration as well. During the evaluation it shall be determined if the human and technical resources in the respective countries might contribute also to the demands of other countries;
- discuss the proposed further steps towards a Pacific MAR network (e.g. MAR coordination, criteria list, restrictions and needs, task force) with representatives of the visited countries;
- prepare the results for the MAR workshop and the following FRA workshops in Nadi.