Annex 9: FRA 2010 Remote sensing survey task force report

Global Forest Resource Assessment 2010 Remote Sensing Survey Task Force
1st Meeting 4-5 March 2008, Rome Italy
(Part of Global workshop: Launch of FRA 2010)

Draft Report

Summary

- This report is a summary of the first meeting to establish the Remote Sensing Survey (RSS) Task Force as a part of the FAO Global Forest Resources Assessment 2010.
- The meeting was held in Rome on 4-5 March 2008. It was attended by 42 people (Attachment C) including country representatives and partner organisations providing technical support.
- It was a parallel event to the main technical meeting of the National Correspondents to the Global Forest Resources Assessment 2010 (FRA 2010). The main meeting was attended by 250 participants from 150 countries plus representatives from numerous international organisations (www.fao.org/fra/).
- A Task Force was established made up of 20 countries, with technical support from key partner organisations. The Task force objectives are to:
  - ⇒ provide information and guidance on the plans for the FRA 2010 Remote Sensing Survey
  - ⇒ discuss related technical and implementation issues
  - ⇒ assist the development and testing of the RSS methods and systems, as well as providing constructive feedback and validation of results based on country data and experience
  - ⇒ help spearhead the implementation of the RSS at a sub-regional level.
- The agenda for the RSS Task Force meeting is Attachment A. The meeting consisted of presentations by FAO and the partner organisations on and discussions on technical issues, progress and plans for the RSS. The presentations are available at Attachment D.
- Countries and partner organisations were able to discuss issues and provide input to guide the development of the RSS. The Task Force agreed that a good global tree cover map based on MODIS data at 300 m resolution would be a very useful product from the FRA 2010 RSS for a wide range of purposes. The FRA 2010 RSS provides a robust framework and good data available for 1990 and 2000 and coming soon for 2005. There were technical difficulties with older 1975 MSS data but the long time series was generally thought worth striving for.

Outcomes

- The FRA 2010 Remote Sensing Survey was formally started and the Task Force established to guide the work of the RSS.
- Countries and partner organisations became better informed on the work underway and planned for the RSS.
- Participants were able to share experiences, discuss issues and provide guidance to the organisations developing the RSS.
- Organisations involved in developing the technical methodology and systems for the RSS have a better understanding of the interests and desired outcomes from countries.
- Countries are better informed on their roles in the RSS and can begin planning and or preparation of datasets or other meetings/workshops.

Actions

For countries

- Task Force countries are asked to formally re-confirm their participation and the previous nomination of the focal points to implement the study by responding to FAO by 30 April 2008.
- Countries are encouraged to begin collecting any relevant forest maps, aerial photos, and other datasets that will be useful for the analysis and validation of the selected sample tiles in the pilot study. The location of the 10x10km sample tiles will be at the junctions of the 1 degree

latitude and longitude lines (see http://www.confluence.org/). Maps of forest types in digital form (preferably GIS or even JPEG or PDF) would be useful to compile for comparison with the results produced in the RSS. Similarly, forest inventory field plots in the 10 x 10 km sample tiles (or in similar forest types) will be potentially useful to help validate and improve the remote sensing mapping data that will be developed by the project.

- Countries are asked to review the draft Information Gateway and provide comments back to FAO by 15 June 2008. http://dwms.fao.org/temp/tmp/fra2010rss/index_en.asp
- Mexico to confirm availability for Chairpersons role.

For FAO

- FAO to develop a plan of work for the RSS and inform countries when the activities are likely.
- FAO to finalise the image processing methodology with the partners.
- FAO to consider the issue of appropriate sampling intensity at high latitudes and review the www.confluence.org website approach and report back to the RSS Task Force.
- FAO to finalise the software for data delivery and image management and validation (the MADCAT software).
- FAO to enable different user administration rights and password protection in the design for the Information Gateway to manage data downloading for some areas.
- FAO will circulate the draft land-use classes to Task Force members when discussed with FAO NR to assess consistency with GLCC and other processes.

For Partner Organisations

- Partner organisations to finalise their inputs to the data preparation and processing (SDSU & JRC).
- The cloud cover analysis needs to be reviewed to assist determining where data gaps exist that could be helped by other data (SDSU and JRC).
- The partners involved in the radar work will liaise with FAO to clarify the role and provide more details to the Task Force in due course.

Welcome and introduction of participants

Wulf Killmann, Director of the Forest Products and Industries Division (FAO) formally opened the Task Force meeting. He welcomed the participants and thanked them for their time to provide input to the FRA 2010 RSS. He outlined the history of remote sensing work as part of previous FRA's and expressed high expectations that this RSS would help make FRA 2010 the most comprehensive yet.

Ms. Mette Wilkie (FAO) outlined the meeting objectives (see summary) and noted that the RSS was building on outcomes from previous consultations at Kotka V in Finland in June 2006, and in Washington DC in October 2007. A copy of her slides is in Attachment D.

Session 1: Setting the scene – outline of the approach and progress

Adam Gerrand (FAO) presented a general outline of the FRA 2010 RSS (Attachment D).
The FRA 2010 Remote Sensing Survey is designed to COMPLEMENT (not replace) the national reports for the Global Forest Resources Assessment 2010 and to provide a better picture of land use dynamics such as rates of deforestation, afforestation and expansion of forests. The RSS will provide information which is consistent over time and space, something which is difficult to obtain from a compilation of country reports.

Remote sensing scientists have developed methods for generating maps of tree cover based on MODIS imagery at a resolution of 500 and 250 m. This will result in tree cover maps which can be varied according to the percentage canopy cover and can be generated annually from 2000 onwards. FAO are working closely with Matt Hansen and the group from South Dakota State University (SDSU) and others to facilitate links with national efforts in order to develop and improve the outputs from these methods. Although this provides an excellent illustration of the distribution of forests at a global scale,

the resolution of the MODIS imagery (250 m) is fairly coarse and can be improved upon to obtain better statistics on forest area and forest area change.

The global framework involves wall-to-wall coverage using MODIS (250metre resolution), combined with sampling using LANDSAT 30 metre resolution tiles of 10 km by 10km at the 1 degree latitude and longitude intersections. This is potentially about 13,000 sampling sites (excluding poles and deserts) of which about 9,000 are on vegetated land and results in about a 1% sampling intensity. The sampling strategy is aimed at the global and regional or biome level and should not be used to report on the area and detailed types of a country's forests based on just these sample tiles.

The initial step will be to undertake a Pilot study to test and refine the process before global application. Twenty countries were selected to participate in the pilot study to cover a wide range of forest types and make up the Task Force, supported by FAO and the partner organisations.

Discussion points

- There was some concern among some countries that the RSS results will be different and may possibly contradict the national forest statistics or regional level statistics based on these. This issue was recognised and will need to be considered during the development of the RSS to ensure that the differences are understood and conveyed to users of the results.
  - ⇒ *The aim of the RSS is NOT to generate national level results but to provide some complementary and additional information, especially in areas where data is lacking or out-of-date. The testing of the RSS methodologies through the Task Force countries will be a very valuable part of assessing this issue and developing ways to minimise the impacts of any differences and considering how best to communicate the results. Releasing the RSS reports in 2011, the year following the main FRA 2010 report and tables, was considered to also help separate the results.*
  - ⇒ *Countries were urged to consider how to handle the information generated by the RSS. It is important to point out that the results should be used primarily at global level or down to broad biomes but not for individual country reporting. There may be some potential to provide preliminary results to assist countries with their UNFCCC reporting requirements where they have limited other data. This could be usefully tested during the pilot.*
- Some countries asked if equipment would be provided (e.g. computer hardware, GPS, digital cameras etc) would be provided.
  - ⇒ *FAO was not expecting countries to undertake any additional field work to do the RSS so equipment was not required to participate in the RSS. FAO will provide training to build local capacity within countries and would consider special requests where countries are unable to participate effectively in the RSS.*
- There was considerable discussion on the sampling strategy using the degree confluence points, especially on how that may oversample the higher latitudes.
  - ⇒ *This had been extensively considered during the development of the RSS and the proposed sampling does reduce to every 2nd point above 60 degrees to address this. Subsequent checking of the www.confluence.org website shows perhaps a more sophisticated approach where they define "Primary" confluence points at higher latitudes above 49 degrees. This method will be looked at and report back to the RSS Task Force for consideration. The US noted that it was largely a statistical problem that could be handled during the analysis stage towards the end of the work.*
- The threshold and separation of "forest" from "Other wooded land" (OWL) in the RSS work was also a challenge. This would be good to test during the Task Force pilot work.
- Separating out oil-palm plantations and other crops that are considered agricultural areas will also be difficult using RSS alone. This is also where the country input and validation will be vital to make the results as accurate as possible.
- Due to delays in processing rectified LANDSAT imagery (which is not expected to be available until late 2008) the RSS final datasets will not be processed and made available to countries until 2009. This means the final RSS report is not expected to be completed until 2011.

- A subset of approximately 400 sample tiles has been selected to cover the major forested biomes for initial testing of the methodology in the pilot study with the Task-force countries.
- Each country in the pilot study will initially have a fairly small number of tiles to check and validate to test the process before wider implementation of the system globally in conjunction with remaining interested countries. This will help iron out bugs and refine the methods and processing and improve the final results. A map of these will be circulated to TF members.

Key questions during the Pilot study include:

- Does the automated processing work well?
- Test validation – testing the legend for areas that have changed from and to forest
- Testing up/downloading of images and the software to deliver and handle the images
- Is it manageable for pilot study and issues for scaling up to the global level?
- Freely available Landsat imagery will be used as the primary source for the trend statistics on the 10km sample tiles.
- The pilot study will start by looking at Landsat imagery from 1990 and 2000, and to include information from the 2005 dataset if available in time, and where possible from 1975 (although there are issues with older data). That would give us a 30 year time span and make this the most comprehensive analysis in both coverage and time.
- FAO and JRC will use a common framework and a fairly simple classification system for all sites. Countries are will be actively involved so that the interpretation and validation can take full advantage of the local knowledge of national teams. Support will be provided to countries in terms of pre-processing of the data and through a number of regional training and validation workshops.
- Data will be freely available to be downloaded from the FAO website through an Information Gateway and countries will be assisted with software tools to validate and check the classification (Session 2).
- One of the main challenges will be to allocate changes detected to other land cover and land-use types. The Land Cover Classification System will be used as a starting point but transformed into the classes used for the Forest Resources Assessment (classes 1-3 below). Where there is a change in forest area, we need to obtain additional information on what the forest has changed into – or what kind of land has been transformed into a forest. In those cases, countries will be asked to divide the "other land" category into 4 classes (number 4-7):
    1. Forest
    2. Other wooded land
    3. Other land with tree cover
    4. Grassland/range/herbaceous
    5. Agricultural crops
    6. Built-up area
    7. Other non-vegetated areas
    8. Water
    9. No data

- The data can be uploaded to FAO and analysed at regional, biome and global levels.
- The main expected outputs are:
    - ⇒ regional, biome and global trends related to forests 1975-1990-2000-2005:
    - ⇒ area change statistics, and information on land use dynamics
    - ⇒ global and regional tree cover maps
    - ⇒ a framework to support further monitoring of forests, land use and environment
    - ⇒ baseline data for research and modelling
- There are a number of positive spin-offs of this project: Capacity building for forest monitoring and a pilot project for a national monitoring system in some countries.

- Prepare countries to benefit from the mechanism for reducing carbon emissions from deforestation in developing countries which is currently being discussed within the United National Framework Convention on Climate Change (UNFCCC).
- A timeline for the RSS was outlined including setting up RSS Task Force to refine methods, advise & test the process (see Attachment D – Adam Gerrand's PowerPoint PPT file)
- 2008- analysis by 20 countries in Pilot Study
- 2009: most of the work in other countries, hold regional workshops, training etc
- 2010: Analysis and draft report preparation
- 2011: FRA Remote Sensing Survey report released.

Fred Stolle, World Resources Institute (WRI) USA, Remote sensing work at WRI and linkages with FRA (See PPT Attachment D).

The World Resources Institute has been using remote sensing data in a number of projects in collaboration with governments and organisations and gave examples from Cameroon and Indonesia. WRI is primarily interested in using remote sensing to monitor forest changes, especially deforestation, and through that to provide better transparency and influence policy changes and better forest management within countries through improved information and capacity to use that information.

Discussion points

- It was noted that in addition to monitoring deforestation, the RSS should also collect improved information on afforestation and reforestation because these can be very important in some areas.

John Latham (FAO) Evaluation of methodologies of the FRA 2010 RSS and linkages with other systems

John Latham (FAO) presented some of the background as to why the FRA RSS data is needed to better inform people of the extent and location of major ecosystem changes (see PPT Attachment D). He gave an overview of the linkages between the various processes including:

- Global Terrestrial Observation System (GTOS);
- Global Land Cover Network (GLCN)
- Land cover classification system (LCCS)

and emphasized that we need to work to build synergies and consistency with other approaches. He also outlined the main components of the work done by FAO in developing methodologies and processing some of the sample data which are presented in more detail below.

The draft categories that are proposed for use in the FRA 2010 RSS for classifying the areas where a change in tree cover is identified are a simplified version of the LCCS. FAO will circulate the draft land-use classes to Task Force members when discussed with FAO NR to assess consistency with GLCC and other processes. Countries will be asked to review this as part of the pilot study.

Ilaria Rosati (FAO) Visual interpretation methodology and comparison of results, consistency, repeatability, and efficiency (See PPT Attachment D)

Ilaria Rosati (FAO) presented a summary of the work done on the analysis of visual classification methods compared to the automated processing of images. The visual methods had some advantages including producing a lower number of output polygons, but had much longer processing times and were not feasible to be done for the large number of samples planned for the whole RSS. The time needed to process per tile varied from simple forest type areas of 2.5 hours per tile to more complex fragmented forest areas which could take up to 32 hours per tile. This is the main reason it is not feasible or practical to process the global remote sensing data using manual visual methods.

Advantages of visual classification:	Disadvantages:

• full supervision of the process	• resource and time consuming
• manageable number of polygons	• high skill requirements
• consistent and reliable results	• subjective results depends on the operator
• incorporation of human logic	• non consistent results for global project
	• would not be consistent over time

Automated pixel based methods were compared and the relative merits are below:

Advantages of automated pixel classification:	Disadvantages:
• fast, simple, robust, consistent approach within scene	• produces salt and pepper effects
• requires minimum interaction from the operator	• results depend on the accuracy of the individual date classification
• can be replicated across teams or scenes and batch processed	• sensitive to threshold values
• not limited to the visual bands or band combinations, using multi spectral information	• overshoot of classified changes

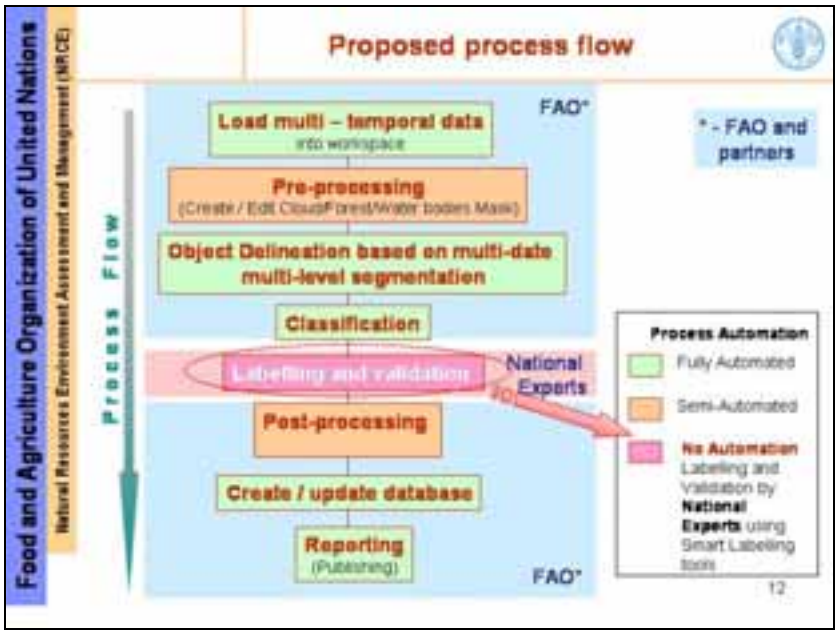
Renato Cumani (FAO) Object based methodology, image segmentation and comparison of results, consistency, repeatability, and efficiency

Renato Cumani (FA) presented the results of FAO work on automated processing of imagery using object based approaches (see Attachment D).

Preliminary results of advantages and disadvantages of Object based methods:

Advantages:	Disadvantages:
• high level of automation possible	• larger number of polygons than the visual method
• spatial and spectral clustering of segmented objects yields comparable results efficiently	• higher number of polygons than the visual method for validation
• proposed methodology creates a manageable number of polygons with indication of rated changes	• dependency on: o pre-processing inputs; o quality of the imagery; o thresholds and land cover condition

The proposed processing flow is outlined below. FAO and partners are proposing to make available the raw and processed imagery which has had a preliminary automated object based classification applied to it. Countries will be asked to check the labeling and to code the areas that are identified as changed from (or /to) forest to indicate the new (or prior) land use.



The preliminary conclusions from this work so far indicate that:

- many processes can be automated contributing to increased efficiency
- the quality of the delineated segments achieved by using "Definiens" software is equal or better than the manual interpretation.
- outputs are affected by the quality of the input images, with data input problems reducing output quality
- initial results indicate that the methodology detects changes well and will meet the FRA 2010 objectives.

Session 2: Proposed software for image processing and delivery by FAO

Antonio di Gregorio (FAO) Image analysis and change detection software tools – including preliminary review of MadCAT software

Antonio di Gregorio (FAO) presented on the software being developed by consultants for FAO for countries to view and process the imagery called "MAD-CAT" (MApping Device - Change Analysis Tool). This is still under construction but will be made available to countries to test in the pilot phase. This will help detect and fix problems so that the later release to all countries will perform better. It is intended that the software will be made available free of charge to FAO member countries participating n the FRA 2010 RSS.

The main features of the software were outlined including a multiple window viewing and editing capability, allowing vector and raster data to be loaded, smart-labelling of objects of interest based on few user defined samples, and semi-automated pixel based change detection.

Antonio Martucci, FAO Data supply, pre-processing and dissemination for decentralized classification/interpretation work – the draft FAO web-based Information Gateway

Antonio Martucci (FAO) presented on the work so far on the development of an "Information Gateway" or image data supply system using the internet to support the Remote Sensing Survey data dissemination and sharing (see PPT Attachment D). There will be between 200 and 400 images in the pilot study that will be available to download through the system.
The system has four main components:

1. Metadata Catalogue & Web Map Viewer
2. Imagery Archive (South Dakota State University)
3. Sample Browser
4. FRA 2010 Resources (FRA 2010 home page and related weblinks)

Note that this system is still under development but a preliminary version is available on-line for initial inspection (some functions still don't work but the block browser may be of interest to countries to show the initial sample tiles selected for the pilot study). http://dwms.fao.org/temp/tmp/fra2010rss/index_en.asp

Most of the functionalities will be developed upon FAO's GeoNetwork (*http://geonetwork-opensource.org)*, the standards based, free and open source catalog application that provides a decentralized spatial information management environment. Users will be able to search for imagery by country, or select dates or locations. The system will provide a link to the image archive of South Dakota University for the LANDSAT images. Other links will enable users to go directly to the same sample point location in both the www.Confluence.org website and Google Earth (if installed and with high capacity internet connection). There is the potential to add password protection and administration rights to various levels of users if this is required. Authorized users such as national and regional teams, will be able to create new records, set privileges and perform remote uploading of:

- validated and labelled layers
- auxiliary data (aerial photos, vegetation/forest maps, inventory data, tables, documents, pictures
- information about data (metadata)

The image delivery system is still under development but will be made available to the Task Force countries for testing and review during the pilot study.

Actions

For FAO

- FAO needs to finalise the image processing methodology with the partners
- FAO and partners to finalise the Information Gateway (image supply system).

For Partner Organisations

- Work with FAO to finalise the image processing methodology
- Process the imagery to agreed standards and file name conventions etc for loading into the Information Gateway.

For countries

- Countries are asked to review the draft Information Gateway and provide comments back to FAO by 15 June 2008. http://dwms.fao.org/temp/tmp/fra2010rss/index_en.asp
- Countries are asked to consider any special requirements they have for the Information Gateway (e.g. input or outputs to be in particular GIS formats etc) and let FAO know by end of June 2008 so that these can be considered for inclusion.

Session 3: Remote Sensing processing by partner organisations

The Joint Research Centre (JRC) TREES-3 project: "Global Forest resource Monitoring" with a focus on the tropics and boreal Eurasia.

Frederick Achard from the Joint Research Centre (JRC) presented on the results so far from the work done by the JRC (see Attachment D). The group has developed methodology for processing high resolution (30m) remote sensing imagery to estimate tree cover and areas of rapid change between 1990 – 2000 and 2005. This can be used to assist in understanding the drivers of deforestation at sub-regional levels and carbon emission estimates derived from tree cover changes. The work has also included analysis of the image quality (incl. clouds etc) that can help identify where other data sets may be required.

Case studies have been done Congo basin for period 1990-2000, assessing the global sampling approach over Brazilian Amazonia and adaptation of sampling to territorial monitoring in French Guiana 1990-2006. The key conclusions from the work so far are:

1. An operational test of the method has been carried out

2. The global sampling approach is valid at regional level

3. The global sampling scheme can easily be adapted to national scale and applied operationally.

Jesus San Miguel, JRC European component of JRC remote sensing work.

Jesus San Miguel (JRC) presented on the work done to develop harmonised pan-European forest maps. These require high resolution imagery as many of the changes are small patches, so they are aiming for LANDSAT quality or better (i.e. <25m pixels). From 1990 to 2000 there were 400 LANDSAT scenes used to cover Europe. For 2006 they are using SPOT and LISS with a total of 2,000 scenes. Shuttle radar topography is being used and the final product is generated using a fully automated algorithm.

For the FRA 2010 RSS the whole of Europe has 773 sample tiles based on the degree confluence points. The results from the FRA 2010 RSS will be able to be compared to the pan-European forest maps to assist validation and also enable some investigation of relationships between the sample tiles and wall-to-wall census results.

Matthew Hansen, South Dakota State University, US Global full coverage monitoring using MODIS vegetation continuous fields and system and progress on provision of geo-rectified LANDSAT imagery for sample tiles

Matt Hansen outlined the work being done through the University of South Dakota (SDSU and formerly the University of Maryland) in the US. The GEOCOVER GLS data will be renamed the Global Land Survey for 1990, 2000, and 2005 and is hoped to be completed by June 2008. The US has announced it intends to progressively make the whole LANDSAT archive available at no-cost when it has been be processed. The LANDSAT sample block pre-processing will be done by SDSU who will also supply the first draft of a global water mask and forest mask.

He said that while there were still uncertainties in remote sensing techniques there was a general convergence of evidence between datasets and methods. However, he cautioned users of the imagery to be aware of the seasonality and check the dates – especially when doing any estimates change by comparing with an image from another season. He also said that they don't think they can get accurate estimates of change in absolute area terms from the coarse resolution of MODIS. It does provide a good indicator that change may be occurring in that area but should not be used to calculate the absolute extent in hectares.

He noted that the VCF used a cover threshold of 25% and would get a lot of errors of commission if a lower cover threshold were to be used. This indicates the difficulties of using coarse resolution remote sensing in sparsely wooded areas or for estimating the area of "Other Wooded Land".

Key discussion points on session 3

- It was noted that the reporting requirements of the UNFCCC of down to 0.5ha were a big challenge to do over large areas.
- This affects the minimum patch size which is an important item to test and seek agreement on as part of the pilot study. 5 ha was suggested as appropriate for global analysis – to be agreed.
- Indications were that the 1975 remote sensing data may be reasonable for large homogeneous blocks but less good for fragmented areas.

Session 4: RSS Task force countries to share experiences

Task Force countries briefly outlined their current and past use of remote sensing for forest analysis and capability to use the data and systems outlined in the presentations. A summary of the main points presented by each of the countries is presented in Attachment B. The Task Force countries were selected to cover a wide range of biomes/ecozones and also include a wide diversity of economic development and experience with remote sensing. Not all the developed countries are strong in remote sensing and several European countries have limited or only very recent experience using remote sensing as part of their forest inventories. These tended to be countries that already have very good mapping and field plot data so that remote sensing had historically not been seen as adding much value.

Session 5: Other related forest remote sensing work

Christiane Schmullius, Jena University High resolution multi-frequency and SAR imagery – availability and opportunities to support the main data sources

Christiane Schmullius outlined the use of radar 2010 RSS to investigate the use of radar data for forest analysis, particularly to fill gaps where other sources of data are not available. Radar has some difficulties but also some advantages, especially in that it is an active signal which can often penetrate cloud and collect data where other passive remote sensing systems cannot. Radar can also develop Digital Elevation Models that can be useful for processing and handling other data (e.g. shadows and reflectance). She presented some results from work in Russia where the time-series data was particularly valuable.

Comments from countries that had experience with radar data indicated that the data availability was low and the price very high and the processing complex. There were several calls for more clarity about how the radar data work was to be fitted in with the rest of the work. FAO and partners will clarify the work and provide more details to the Task Force in due course.

Session 6: Develop FRA 2010 RSS implementation plan and resource needs

The Task force separated into 5 break-out groups for discussion of issues in implementing the RSS and resource needs. The groups included representatives from the Partner organisation and were based around 1. Europe and Russia, 2. North America, 3. Central and South America, 4. Asia-Pacific, 5. Africa.

The groups discussed

- implications for implementing the RSS
- Initial planning for training workshop needs, dates and place options.
- Identify possible regional lead countries (and organizations?), delivery dates, resource needs?

A rapporteur from each group reported back to the main meeting and the results are summarised below. The South American and African groups PowerPoint Presentations are included in Attachment D.

North America

The group outlined the products that they thought the FRA 2010 RSS should aim to produce:

1. Global tree-cover map for 1990 and 2000 as a poster or product for reports
   This would be good for checking/updating/validating the previous global map. They were not keen for this to try to show land use dynamics.
2. Statistics on tree-cover change based on the sample block analysis:
   - 1990 to 2000 the first priority, then to 2005 if possible, 1975 difficult so lower priority.
   - Suggested that the North American Forestry Commission define the boundaries.
   - May use other data to represent the area rather than the automated processed tile data.

   There was some concern over the potential for others (public – or specific interest groups) to easily download all the tiles and do inappropriate analysis or produce misleading information. Password protection may be required to manage large data downloading for some areas.

   Calling the RSS results "tree-cover" was a good way of differentiating the results from the political sensitivities of "forest" area and making it clearly separate from the forest areas presented in Table 1 of the main FRA 2010 report.

3. Land use dynamics was thought by this group to be only available through other sources of ancillary data and not remote sensing. This may take extra effort to do.

Europe

The group felt that for most European countries there would not be too many significant implications with the exception of the large workload involved to process the big number of tiles for Russia. The group clarified the countries minimum role as being to check and validate the pre-classified imagery from FAO or JRC. It was vital that the software provided be able to change the polygon boundaries as well as code labelling.

They considered that if possible a meeting in Rome in November would be useful or the EU forest week in late October. They didn't finalise a list or nominate lead countries but were happy to work as a group in the pilot study.

Technical issues:

- Projections need to be considered and agree on a standard (include as part of Pilot Study tasks).
- A list of what the windows will be able to do (presumably on image processing software?)
- Will there be options for changing the software (yes, will be tested & refined in pilot process).
- Need to discuss the best file format and agree on a standard and specifications (underway).

Asia-Pacific

The main goal was clearly to produce a land-cover map from which the products such as a) forest areas, b) non-forest and c) water. They felt the proposed methodology was suitable and that the pilot process was useful to test and improve the results. It will also help the countries decide if the whole process will work.

They proposed one regional workshop in Asia, either China, India, or Australia. There may be a need for two sub-regional trainings in China and Thailand. The delivery date depends on image availability and starting date.

Africa
Basically supportive of the RSS study. Agreed that training should be done regionally. See more detail in slides in Attachment D.

Some requirements for support for provision of hardware: e.g. computer for analysis and upload /download of preprocessed segments. Also possible requirement to plot out sample unit /blocks for field verification, GPS needed and training, and field manual was wanted *[FAO responded by saying that it was not intended that countries had to go to the field to check the tiles – using existing known information should be sufficient and that FAO did not have funds to support fieldwork in this process]*.

Countries not able to attend this meeting (notably DR Congo) need to be contacted and included later.

South America
Overall the FRA 2010 approach is good for continental sampling but may not work well for some specific forest types (e.g. South American temperate forests). See more detail in slides in Attachment D.

FAO should produce a standardised validation protocol (methods and manual?).
The map products should be validated by the National Correspondents or the nominee.

Session 7: Identify issues and options for best way forward

The 20 Task force countries considered technical issues in replicating and expanding the RSS from the pilot study countries to all FRA 2010 countries globally, and discussed options to reduce or resolve these. Mette Wilkie outlined the proposed legend for land-use change dynamics and clarified that it is not intended to try to estimate changes in the FRA category of "Other Wooded Land" with this remote sensing study. Where there is a clearly identified change affecting forest areas, then countries are asked to identify the classes that patches have changed to. The Task Force needs to review and agree on the proposed classification matrix.

Claude Vidal (France) indicated that the transition matrix is difficult and in most cases the remote sensing data cannot be relied on alone to do this, it requires other data and local knowledge. Some countries expressed concern over the time and resources to do this work. Alberto Sandoval (Mexico) said that he didn't think it was possible to do without field checking.

Actions

For FAO

- FAO to finalise the software for data delivery and image management and validation (the MADCAT software).
- FAO will circulate the draft land-use classes to Task Force members when discussed with FAO NR to assess consistency with GLCC and other processes.

For Partner Organisations

- Partner organisations need to finalise their inputs to the data preparation and processing and comment on the land use change matrix (SDSU and JRC).
- The cloud cover analysis needs to be reviewed to assist determining where data gaps exist that could be helped by other data (SDSU and JRC). This may help guide the selection of the SAR radar sample test areas (Jena University).

Composition and mode of operation and future actions of the RSS Task Force

The Task-Force was considered a good approach and no major changes to composition were put forward. It was recommended that it be Chaired by a country representative. Mexico indicated a willingness to undertake the initial Chairpersons role (subject to confirmation after returning to Mexico). The involvement of the technical partners was vital for contributing data and valuable technical expertise to the process but it was agreed that the Task-force be a country-led process.

It was considered that the Task Force should meet once per year but will likely need one meeting in late 2008 (date to be confirmed) to test the data delivery system and the image processing and validation software.

Actions

For FAO

- FAO to develop a plan of work for the RSS and inform countries when the activities are likely.

For countries

- Task Force countries are asked to formally re-confirm their participation and the previous nomination of the focal points to implement the study by responding to FAO by 30 April 2008.
- Mexico to confirm availability for Chairpersons role.

Wrapping up, next steps and concluding comments

Mette Wilkie and Adam Gerrand (FAO) thanked all participants for their contributions resulting in a better understanding of the RSS by countries and clearer directions for FAO and the partners to be able to move forward. The next steps for FAO will be to write up a draft meeting report for circulation to the Task Force members and plan the future work including finalising the software, image processing and data delivery systems in conjunction with the partner organisations.

Report back to FRA 2010 plenary meeting, Thursday 6th March

Ernesto Diaz from Mexico presented a summary of the main points from the Task Force meeting and an outline of the next steps back to the main FRA 2010 Plenary session so all other countries are informed of RSS work and their future engagement.

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