INTERNATIONAL WORKSHOP ON FOREST GHG ACCOUNTING AND REPORTING FOR THE KYOTO PROTOCOL

CONCLUSIONS

1. The international Workshop on Forest GHG Accounting and Reporting under the Kyoto Protocol was held in Tokyo from 6 to 8 June 2006.

2. The Workshop was hosted by the Forestry and Forest Products Research Institute and the Japanese Forestry Agency. It followed the Workshop on Practical National Forest Inventory Systems held in Tokyo in November 2004. The previous Workshop dealt with research and monitoring efforts by Japan and other countries. The second Workshop mainly reviewed progress made by Japan on establishing a national forest reporting and accounting system for use under the Kyoto Protocol.

3. Participants noted that an impressive greenhouse gas inventory system for the forestry sector is being developed in Japan, consistent with Tier 3 requirements of the Good Practice Guidance[1] developed by the Intergovernmental Panel on Climate Change.

4. The Workshop took place at a time when countries are considering the choices they will make and the methods they will use for estimating, reporting and accounting for LULUCF activities under the Kyoto Protocol. The expectation in Japan is that forest management will contribute 3.9 percentage points towards Japan's commitment under the Kyoto Protocol to reduce greenhouse gas emission to 6 percent below base year levels. It is currently estimated that, in 1995, Japanese forests removed an estimated 88 million tonnes of CO_2 per year. The time series will be updated and completed in the 2006 inventory submission by Japan.

5. Participants noted that about 70% of the area of Japan is covered by forests. Forest management has a recorded history of thirteen hundred years in some areas. National circumstances include steep topography, which increases the significance of forests for headwater protection and control of erosion, as well as for timber production and conservation of biodiversity. Management practice includes thinning as stands mature to maintain the health conditions of forest ecosystems and maintenance of the understory necessary for the functions required, particularly erosion control. Recently the price of timber has been falling which tends to put these functions at risk.

6. Japan has a powerful and very well integrated data management system, bringing together historical records and maps, stakeholder data, field surveys and remote sensing data. The system uses data from the forest registers which are updated every five years. It contains a geographical database with stand characteristics at the forestry subcompartment level that will be very useful for estimating carbon stock changes, with results aggregated as necessary for

[1] *Good Practice Guidance for Land Use, Land-Use Change and Forestry*, IPCC National Greenhouse Gas Programme, Institute for Global Environmental Strategies, Hayama, Japan, 2003.

reporting at Prefecture level, and cross referenced as required for verification and review. Modification to data in the system, e.g. changes to polygon boundaries to improve correspondence with patterns of land-use change should be noted in the system for transparency and for audit purposes.

7. Afforestation, reforestation and deforestation under Article 3.3 of the Kyoto Protocol are to be detected by comparison of aerial photography and SPOT satellite images using a 500 metre sampling grid. Landsat thematic mapping (TM) and orthophotograhs have been used to define the total forest distribution in 1990, but TM does not have sufficient resolution for ARD detection in Japan. The total area of deforestation is small but the associated emissions need to be taken into account.

8. Participants discussed the use of a factor termed 'forest management rates'(FMR). FMR are proposed for use in estimating carbon stock changes associated with the narrow definition of forest management that Japan is considering. They are the ratios, established by sampling, of area of land under particular types of forest management to the total area of managed forest. The activity data on forest management lands are combined with the removal factors per ha of land from yield tables of thinned stands. Stock changes from clear-cut harvesting are considered separately. The resulting estimate of area of forest management lands is then used to estimate emissions and removals which can be verified using the data management system described above in paragraph 6.

9. To estimate carbon stock changes in dead organic matter and soil Japan is using a version of the CENTURY model that has been parameterised for regional conditions. This approach had been chosen because there were insufficient data to detect changes in soil carbon stocks from sampling associated with forest management or managed forests. Participants agreed on the approach taken to adjust the model to Japanese circumstances. Data from representative sampling are important for calibration, initialisation and verification. Transparency in these areas will be important to facilitate review.

10. The CENTURY model had been verified using some measured data including chronosequences on afforested sites, though this is not easy especially given the long time constants involved in the dynamics of soil organic carbon. Results should be checked against reasonable expectations about the dynamics of carbon pools. Verification using data from forest soil carbon inventory might also be useful to meet Good Practice Guidance.

11. Participants noted the very extensive and careful work on biomass expansion factors (BEFs), root-to-shoot ratio and wood density. The BEF data were being applied using two age strata; an alternative that might be considered would be to fit continuous functions to the data. An intermediate approach could be to use continuous functions for major species, but retain the simple stratification for other cases.

12. Uncertainty analysis is well advanced in Japan. Participants noted that the method should be applied to the estimation of stock changes rather than stocks.

Uncertainties were likely to be dominated by the most uncertain components of the calculation. Correlation should be taken into account as far as possible in estimating uncertainties. This can often be done by aggregating quantities. Monte Carlo analysis could be considered for combining uncertainties in complex functions. Greater detail in reporting tables should be provided by providing additional rows where necessary, rather than by subdividing columns.

13. The system being developed by Japan takes account of the long history and extensive data already available, and the relatively small rates of land-use change. The Workshop also heard interesting presentations of the systems emerging in Canada and New Zealand and noted the different emphasis in the way existing data, ground based surveys, remote sensing and models were being combined to provide the best possible carbon stock change estimates under given national circumstances. This is consistent with expectations as set out in the IPCC 2003 Good Practice Guidance.

14. The participants thanked the Japanese hosts warmly for generously hosting a very interesting workshop and noted how valuable exchanges of this kind were in sharing experiences and building mutual understanding.

Tokyo June 2006

List of Participants

Co-chairs

Masahiro Amano	Waseda Univ.
Jim Penman	United Kingdom

Invited experts

Rainer Baritz	Germany
Dominique Blain	Canada
Werner Kurz	Canada
María José Sanz-Sanchez	Spain
Bernhard Schlamadinger	Austria
Zoltán Somogyi	Hungary
Göran Ståhl	Sweden
Peter Stephens	New Zealand
Raelene Hurndell	New Zealand
Craig Elvidge	New Zealand
Xiaoquan Zhang	China
Taka Hiraishi	IGES
Tomoyuki Aizawa	National Institute for Environmental Studies

Japanese speakers

Toshiyuki Akagi	Forestry Agency
Mitsuo Matsumoto	Forestry and Forest Product Research Institute (FFPRI)
Yoshio Awaya	FFPRI
Masamichi Takahashi	FFPRI
Hisao Sakai	FFPRI
Yoshimi Sakai	FFPRI
Toshiro Iehara	FFPRI
Masahiro Takeda	Mitsubishi UFJ Research and Consulting Co., Ltd
Kei Suzuki	Japan Forest Technology Association (JAFTA)

Japanese experts

Motoaki Okuma	FFPRI
Kazuhiro Ishizuka	FFPRI
Takuoki Hisada	FFPRI
Akira Sato	FFPRI
Haruo Sawada	FFPRI
Yoshiyuki Kiyono	FFPRI
Kazuo Hosoda	FFPRI
Kazuhito Morisada	FFPRI
Manabu Takeuchi	FFPRI
Hidesato Kanomata	FFPRI
Tatsuo Sasaoka	Forestry Agency
Akira Kuribayashi	Forestry Agency
Atsunori Okamura	Forestry Agency
Hiroyuki Miyazaki	Forestry Agency
Zyunko Torigoe	Forestry Agency
Naoko Tsukada	Forestry Agency
Masayoshi Nakamura	Forestry Agency
Takashi Tominaga	Forestry Agency
Yoshihiro Matsui	Forestry Agency
Yoshio Fujioka	Forestry Agency
Satoshi Kinoshita	Ministry of Agriculture, Forestry and Fisheries
Naoya Tsukamoto	Ministry of Environment
Yoshio Nagura	Ministry of Environment
Keiko Yoshikawa	Ministry of Environment
Sachiko Tsukahara	Ministry of Environment
Masahiko Kanamori	JAFTA