

The Workshop on Elaboration and Development  
of Forest Monitoring in East Asia  
16-19 December 2002, Seremban, Malaysia

## CHAIRPERSON'S SUMMARY

### Introduction

1. The Workshop on Elaboration and Development of Forest Monitoring in East Asia was held in Seremban, Malaysia, from 16 to 19 December 2002, organized jointly by the Network Center for the Acid Deposition Monitoring Network in East Asia (EANET) and the Programme Coordinating Centre of the International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests), and hosted by the Government of Malaysia.
2. The Workshop was attended by 28 participants from ten EANET participating countries, namely Cambodia, China, Indonesia, Japan, Lao PDR, Malaysia, Mongolia, Philippines, Thailand and Viet Nam, and experts on forest monitoring. Delegation of ICP Forests was also present. IMPACTS Project was represented by Dr. Eilertsen. An expected participant from Russia could not attend because of urgent business. The list of the participants is attached as Annex.
3. The objectives of the Workshop were:
  - (i) to acquire information on monitoring methodologies and on applicability of activities within ICP Forests for spatial evaluation of monitoring data in East Asia;
  - (ii) to clarify present situation and issues on forest monitoring in the East Asia region; and
  - (iii) to discuss directions and resources to develop forest monitoring methodologies suitable for the East Asian region, taking into account the experience in European countries.

### Opening of the Workshop (Agenda Item 1)

4. The Workshop commenced with opening address by Ms. Adelaida Bonquin Roman, Programme Officer, United Nations Environment Programme, Regional Resource Centre for Asia and the Pacific. the Secretariat for EANET, and welcoming address by Dr. Nadzri Yahaya, Deputy Director, Conservation and Environmental Division, Ministry of Science, Technology and the Environment (MOSTE), Malaysia and followed by speeches of Dr. Tsumugu Totsuka, Director General, the Acid

Deposition and Oxidant Research Center (ADORC) serving as the Network Center for EANET, and Mr. Thomas Haußmann, Chairman of ICP Forests.

5. As the bases for further discussion, Dr. Martin Lorenz, Senior Scientist, Federal Research Centre for Forestry and Forest Products made a presentation introducing ICP Forests. The meeting agreed this information is helpful in identifying common aspects and to share experiences gained so far.

#### Election of Officers (Agenda Item 2)

6. The Workshop elected Dr. Tsumugu Totsuka, Mr. Thomas Haußmann and Prof. Muhamad Awang, Deputy Vice Chancellor, Universiti Putra Malaysia as Co-Chairpersons.

#### Adoption of Agenda (Agenda Item 3)

7. The Workshop adopted the agenda as proposed by the Network Center for EANET and the Programme Coordinating Centre of ICP Forests.

#### Present Situation of Forest Monitoring in East Asia (Agenda Item 4)

8. Dr. Hiroyuki Sase, Senior Researcher, ADORC gave an overview of present situation of forest monitoring program in EANET participating countries. Following the overview, monitoring activities in China, Japan, Philippines and Thailand were introduced by Mr. Liu Fang, Dr. Takeshi Izuta, Dr. Wilfredo Carandang and Dr. Jesada Luangjame respectively. Prof. Baatarbileg Nachin made a brief presentation on some aspects of monitoring in Mongolia.
9. Major discussion on this topic included the following:
  - a. The ensuing discussion focused on the criteria for the selection of Level I and Level II within the ICP Forests as well as on the assessment of tree decline. Issues on species composition and how to differentiate between effects of air pollution and other factors were discussed especially on high and moderately tolerable species. This applies particularly to early detection and verification.
  - b. It was expected that future conclusions and recommendations by EANET should be communicated to the decision makers through the Intergovernmental Meeting.

- c. It was pointed out that effect of nitrogen deposition on forest area should be considered as an important issue to clarify the state of the art in the EANET program, as it could mask the possible effect of acid deposition. Siting criteria to establish the plot, utilization of satellite image, litter fall measurement in relation to nutrient dynamics, as well as sampling frequency and question of stemflow were raised by the participants. Finally, integration of multiple impacts such as climate change, desertification, besides the acid deposition and air pollution, were also discussed.

#### Methodologies for Large-scale Monitoring (Agenda Item 5)

10. Methodologies and its applicability on Level I monitoring of ICP Forests were introduced through the presentation by Prof. Johannes Eichhorn on visual assessment of crown condition, and the presentation by Dr. Hannu Raitio on sampling and analysis of needles and leaves. Special attention was paid on the development of common methodologies under the European condition and on effort to improve quality assurance.
11. The possibility of the application of the methodologies to East Asian region was discussed as follows:
  - a. First experiences were gained so far with crown condition assessment in some EANET participating countries.
  - b. Notably, visibility of the dominant tree crown was pointed out as a problem for the tropical forest.
  - c. Applicability of hemispherical photograph was considered useful for light assessment.
  - d. The main items of discussion of the presentation by Mr. Raitio were the foliage sampling in different part of the crown, relationships between foliage and soil chemistry, and various methods of analyses in the laboratory.
12. Dr. Takeshi Izuta and Dr. Yoshihisa Kohno gave information on sensitivities on East Asian plant species. The following remarks were made regarding the presentations.
  - a. In the subsequent discussion, the history of forest decline in Japan with respect to air pollution impact since the 1980s was highlighted and special attention was paid to the synergistic effect of air pollutant.
  - b. Their presentations, on the impact of acidification in Japan, focused on the methods and results of acidification and fumigation experiment. The delegates discussed differentiation between symptoms of air pollution and biotic factors and question of defining damage and thresholds values.

Methodologies on Intensive Monitoring (Agenda Item 6)

13. Methodologies on intensive monitoring of ICP Forests were introduced through the presentation by Prof. Teja Preuhsler. He introduced the workshop participants to the full range of the methods of increment analysis. This included description of forest yield science as an integrated approach, involving the wealth of environmental factors influencing tree growth. Dr. Gebhard Schüler presented the methods of soil sampling and soil type classification. He also introduced the participants of the workshop to the parameters to be analyzed as well as to a choice of laboratory analysis methods. For better understanding of the purpose of some analyses, he also explained basic processes in soils resulting air pollution impact. Moreover, he described the purposes and methods of soil solution sampling and analyses making special reference to the most important parameters to be assessed and to modeling approaches in order to calculate fluxes.
14. Major discussion on this topic included the following:
  - a. The application of the presented methods in East Asian countries was discussed with special focus on tree ring analysis. The meeting concluded that different methods are to be applied in different climatic regions in East Asia. Moreover, the influence of different environmental factors including silvicultural methods was discussed.
  - b. The presentation by Dr. Schüler gave rise to the discussion on the importance of concentrating monitoring activities on selected plots aimed at the integration of as much information as possible for ecosystem related studies.
  - c. In addition, it has been mentioned that there was a similarity between ICP Forests and EANET program on the overall activities, except for soil solution analysis. However in the EANET strategy paper, which has been endorsed in the Second Session of Scientific Advisory Committee, soil solution analysis is mentioned specifically as part of its forthcoming activities.
  - d. It was pointed out that calibration and/or maintenance of instruments might be more important than use of costly instruments for obtaining reliable data.
  - e. The workshop reiterated the importance of the concentrating different surveys on selected plots and to link different research institutions.
15. Prof. Dr. Muhamad Awang presented the monitoring of forest growth in tropical region. His presentation started with highlighting the status of air pollution and acid deposition in Malaysia based on monitoring network programme conducted by the Malaysian Meteorological Service Department and Department of Environment, Ministry of Science, Technology and the Environment Malaysia over the last ten

years. Subsequently he discussed on site description of Pasoh Forest Reserve as one of the Monitoring Station for EANET Program. A special mention was made on historical perspective of research program carried out in Pasoh between 1970s and 2002 initiated by IBP and MAB program as well as FRIM-STRI and FRIM-NIES-UPM from 1990 to present day. Particular topics were mentioned on soil chemistry, forest vegetation, ecosystem physiology and other related works. Those topics were very much related to EANET activities, and the process data mining was very much emphasized for future program. The presentation was concluded with several recommendations, among others on the possibility of optimizing the 30-year data, enhancement of the human resource development through formal and informal program. The following remarks were made regarding the presentations.

- a. In the discussion, participants focused on the possibility of optimizing the existing data tailored accordingly for the purpose of EANET activities and its sustainability, particularly on achievability and maintaining the QA/QC programme.
- b. It was suggested that collaboration by relevant agencies within the participating countries need to be strengthened in order to achieve the EANET objectives fully.

#### Field Demonstration in Forest Area (Agenda Item 7)

16. A field demonstration was organized to Pasoh Forest Reserve. This visit included a discussion on visual assessment of crown condition, analysis of tree growth, and assessment on forest soil condition.

#### Effect of Ozone (Agenda Item 8)

17. Dr. Georg Krause in his presentation explained the measurement of ambient air pollution, with special emphasis on passive monitoring of ozone and on assessment of ozone visible injury. The main points of this presentation were monitoring design, function of passive sampler, the validation of measurement of results, and the occurrence of visible injury on wide range of species. He highlighted the risk assessment in Europe based on dose-response relationships and thresholds.
18. Major discussion on this topic included the following:
  - a. The delegates discussed the application of different types of passive samplers as well as different sampling heights and the influence of canopy roughness on

ozone concentrations at different heights. CEN/TC 264/WG 11 defusive samplers, CEN draft 13528, part 3.

- b. Other items of discussion were the impact of peak concentrations and application of AOT 40.
- c. Threatening of ozone to Asian forests might be limited except on urban sites. Therefore, it was recommended to get the estimate on ozone concentrations and possible injuries on sensitive plant species (bio-indicators).

#### International Research Project in East Asia (Agenda Item 9)

19. Dr. Odd Eilertsen presented the methods and results of the Sino – Norwegian IMPACTS Project in China. He introduced the participants of the workshop to sulfur depositions in industrial regions as well as on their impacts on forest soils, such as acidification. His description of monitoring methods focused on soil and soil water and ground vegetation sampling. He presented the results of deposition measurements at different sites and the development of indicators for acidification.
  - a. The discussion focused on details concerning the sampling design for the ground vegetation surveys and foliar analysis as well as on quality assurance aspects.
  - b. Dr. Eilertsen offered his readiness to provide the EANET with relevant information and data on the IMPACTS Project.

#### Wrap-up of the Workshop (Agenda Item 10)

20. The participants discussed the outcome of the Workshop and agreed that the following points could be derived from the Workshop as major conclusions and recommendation:

From a final discussion, the participants of the workshop draw the following conclusions:

  - a. The monitoring activities of EANET correspond largely to the Level-II-approach of ICP Forests. Prior to any expansion of EANET towards a large-scale approach, such as Level I of ICP Forests, basic survey for the initial objectives and ecosystem related approach of EANET should be the basis for an implementation of its first forest monitoring activities. As a first step, area of such monitoring activities should be discussed and agreed by EANET participating countries during the Intergovernmental Meeting. For this purpose, it was recommended that the necessity and the possibility of the establishment of further EANET plots involving as large a number of countries as possible is

- checked, e.g. based on the RAINS ASIA programme. Financial limitations have to be considered. Long term stable funding of a smaller number of plots should be preferred against short term funding of a high number of plots.
- b. With respect to a closer linkage between different EANET sites, the meeting suggested to implement structures and use modern communication techniques for information exchange. For this purpose it was suggested that national experts communicate directly with each other, possibly even aimed at the implementation of expert groups.
  - c. The cooperation between EANET and ICP Forests is very useful. Concrete follow-up actions will include direct e-mail communications between EANET participants and ICP Forests expert panel Chairpersons (e-mail contact see [www.icp-forests.org](http://www.icp-forests.org)), invitations to Asian experts to ICP Forests expert panel meetings (contact between PCC and EANET secretariat) as well as common quality assurance programmes. The delegate of UNEP indicated that UNEP might be available for cooperation and collaboration with different international organizations programs and projects, as it is one of the main functions of the EANET Secretariat.
  - d. The workshop encourages the Intergovernmental Meeting to consider in linking ongoing environmental activities as far as possible to the EANET program in order to ensure that the most cost effective approach is guaranteed.
  - e. The Co-Chairpersons of the Workshop drew up this Chairperson's Summary with the consent of the participants.

#### Closing of the Workshop (Agenda Item 11)

21. The Workshop was closed. All participants expressed their gratitude and sincere appreciation for the efforts made by the organizers and the host country for having arranged the Workshop.

Seremban, Malaysia, 19 December 2002

Dr. Tsumugu Totsuka      Mr. Thomas Günter Haußmann      Prof. Muhamad Bin Awang

Co-Chairpersons

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