

Growth and Yield Modelling Project

NEWSLETTER NO. 4 – JULY 2000

SYMFOR Changing priorities to support International Development Targets

This newsletter marks an important milestone in DFID's growth and yield modelling project. The first three years of the project concentrated on developing ecological and management models that have become the SYMFOR modelling framework. The latest major release of the framework (SYMFOR²⁰⁰⁰) is announced later in this newsletter. The project now moves into a phase of work where SYMFOR is being applied by a number of groups around the world. The emphasis of this work will be to apply SYMFOR to support international development targets, in particular to the alleviation of poverty. The first major applications workshop was held in Indonesia earlier this year (13-14 June 2000). This newsletter reports on the activities of the workshop and resulting local initiatives.

This will be the last issue of the *Growth and Yield Modelling Newsletter*. The project will now concentrate on promoting the application of SYMFOR. We have a new website <http://www.symfor.org> to support applications and the next newsletter will continue this theme with a new name and format. We look forward to keeping you informed about our work and applications of SYMFOR in the future.

Paul van Gardingen (Project Manager)

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For more information on SYMFOR and for a free download of the software, see our new web site:

<http://www.symfor.org>

SYMFOR Applications workshop in Indonesia. 13-14 June 2000

by Dr Paul van Gardingen
(The University of Edinburgh)



Participants of the Bogor SYMFOR workshop.

Thirty-one invited participants attended a workshop in Bogor, Indonesia on the 13 and 14 June 2000. The workshop was hosted jointly by the Indonesian Tropical Institute (LATIN, Lembaga Alam Tropika Indonesia) a NGO based in Bogor, and the University of Edinburgh's DFID funded Forestry Research Programme project. The participants came from all over Indonesia and represented government and private sector organisations as well as universities and NGO's.

The workshop commenced with six presentations from Indonesian colleagues. Two researchers described case studies that have used SYMFOR to investigate the likely results of the continued application of the Indonesian selective logging and replanting system (TPTI) to areas of primary and logged over forest. Their work identified a number of potential problems in existing forest policies. The remaining presentations considered the potential for SYMFOR to be applied (1) in other forest areas, (2) to support community forestry, (3) to support revision of forest policy in Indonesia, (4) to support the revision and strengthening of forestry curriculum in Indonesia. The written versions of each presentation will be collated and published by LATIN in September 2000.

The presented papers formed the basis for group discussion over both days of the workshop. Participants were asked to identify problems in Indonesian forestry, and then discussed if and how SYMFOR could be applied to solve these. Participants were also asked to identify any further opportunities for the application of SYMFOR in Indonesia.

Staff from LATIN played an important role in facilitating and guiding the discussion. A range of structured

techniques was used to encourage and facilitate participation by all participants. These involved several methods of identifying problems and potential solutions, and matching them together.



Local facilitators were used to encourage structured and open discussion.

The workshop had a number of desired outputs including, (1) the identification of problems, (2) to identify opportunities to use SYMFOR in addressing these problems (3) designing solutions using SYMFOR and (4) proposals for new activities.

By the end of the workshop a number of working groups had been established to make proposals for further work applying SYMFOR in Indonesia. These proposals were designed to fit into priorities that had been identified by the new DFID Indonesian Multistakeholder Forestry Programme. As such they emphasise the need to include a much wider range of stakeholders in forest management and policy debate to realise the potential of forestry to contribute to targets to reduce poverty in rural Indonesia.

Each initiative is being led by one or more of the local participants. These are:

- The establishment of a Indonesian SYMFOR user group supporting applications and case studies.
Dr Paian Sinaturi, IPB
Ir. Ganip Gunawan,, LATIN
- The application of SYMFOR for curriculum development
Dr Herry Purnomo, IPB
- The application of SYMFOR to the revision of TPTI policy
Ir Edy Sardjono, MoFEC.

The outlines of the work proposals will be published along with the rest of the proceedings by LATIN in September 2000. The book and the project outlines will be presented to senior staff from the Ministry of Forestry and Estate Crops, other donor agencies and the new DFID Indonesian

Multistakeholder Forestry Programme at a presentation in Jakarta planned for late September.

We are looking forward to opportunities to working together to improve forestry and reduce poverty in Indonesia.

SYMFOR²⁰⁰⁰ Release

by Dr Paul D. Phillips (The University of Edinburgh)

SYMFOR²⁰⁰⁰ is now released. It is available from the new web-site (www.symfor.org) and on CD on request. SYMFOR²⁰⁰⁰ is the latest release of the SYMFOR software for silvicultural yield management for tropical forests and is the final general release of the software under the auspices of the DFID Forestry Research Programme project (R6195).

Details of the software and its application may be found on the web site. For those unfamiliar with it, however, SYMFOR²⁰⁰⁰ is a framework for models of the ecological process affecting trees in the forest, and models of the silvicultural treatments that may be applied to the forest. Usage of SYMFOR involved *simulating* the forest, rather than predicting results.

SYMFOR requires starting data (describing the forest at the beginning of the simulation) and models of the ecological processes and the silvicultural treatments. These models are already present in the framework, and the user simply selects the appropriate options for their forest or analysis. At any stage during the simulation, data may be output and then analysed using conventional methods. SYMFOR is based on data about individual trees, and so maintains a high degree of detail about the structure of the forest at all times. Results can also be linked with economic models to produce an integrated description of forest management systems.

New in SYMFOR²⁰⁰⁰:

- Improved model of natural processes;
- Wide range of management options;
- Highly tuned user-interface for intuitive understanding.

The release of SYMFOR²⁰⁰⁰ marks the culmination of three years of research and product development, involving training of and feedback from Indonesian counterparts, data analysis and programming. It is an advanced tool that, when used with expertise, can produce wide-ranging and fundamental information about the state and future of the forest, and the effect of any given management or policy decision. A recent workshop was held to discuss the

potential applications of SYMFOR, which ranged from providing information for policy development through to being a training tool in universities and for community forestry (see the article in this newsletter by Paul van Gardingen).

SYMFOR was developed using data from 72 ha of Permanent Sample Plots (PSPs) in East Kalimantan (Indonesian Borneo), where there are lowland mixed Dipterocarp forests. The data are owned by Pt. Inhutani I, the local forest concession holders, and managed by the EU Berau Forest Management Project (BFMP). SYMFOR has been applied by BFMP in that region to advise Pt. Inhutani I about forest management issues. Researchers from BPK Samarinda and Badan Planologi, in the Indonesian government's Ministry of Forests and Estate Crops, have undertaken analyses linking SYMFOR output to local economic models, to investigate the implications of current Indonesian policy on selectively logged forests. The outputs of these analyses are in the public domain, and are contributing to the debate on Indonesian forest policy.

Although designed for Indonesia and by Indonesians, it has not yet been applied to many forest types there. The complexity of the model demands significant time and effort to validate or calibrate the model for other forest types or other regions, and this work is ongoing. SYMFOR is equally applicable outside Indonesia, with the same provisos about validating the ecological model for the local forest type. New projects are being proposed that address the issue of maximising the benefits of the SYMFOR²⁰⁰⁰ tool, the skill of researchers and existing datasets. These studies are targeted at regional level for Asia and the Pacific.

SYMFOR does not stop here. There will be further incremental releases, incorporating advanced models of silvicultural methods and models of the ecological processes for other forest types. SYMFOR is an appropriate tool for producing information about anything that is linked to the forest structure and dynamics characterised by the trees. It is possible that future versions will give information regarding Non-Timber Forest Products (NTFPs), biodiversity or other forest attributes, and SYMFOR will be applied widely throughout the forestry community.

Yield Regulation: using SYMFOR for financial and economic analyses of Indonesian Production Forests

by Moray McLeish (The University of Edinburgh)
& Farida Herry Susanty
(Balai Penelitian Kehutanan – Samarinda)

Many forest concession holders in Indonesia are now on the point of returning to areas of logged-over forest. For the first time they will be harvesting from areas which are not primary forest and this has important implications; for the future structure of the forest and for the profitability of the commercial operation.

Recent work undertaken with PT Inhutani I and the EU Berau Forest Management Project (BFMP) aimed to develop different Yield Regulation systems for logged-over forest in the Labanan concession of Inhutani I, East Kalimantan. The work was aimed at analysing the longer term sustainability and profitability of each alternative. The objective of Yield Regulation is to limit timber production to what is ecologically achievable (and sustainable) given the characteristics of an area of forest. If properly implemented, this should deliver a sustainable timber yield (hopefully financially profitable) and maximise the secondary economic benefits to be gained from forested lands - such as watershed protection and biodiversity conservation.

SYMFOR was used to simulate forest growth and give predictions of future timber yield under different management systems. This yield information was then passed directly into a BFMP spreadsheet model¹ which balances all the financial incomes and outgoings from a concession operation over a 20 year period, and discounts them back to a Net Present Value (NPV). This gave a measure of the financial profitability under the each system.

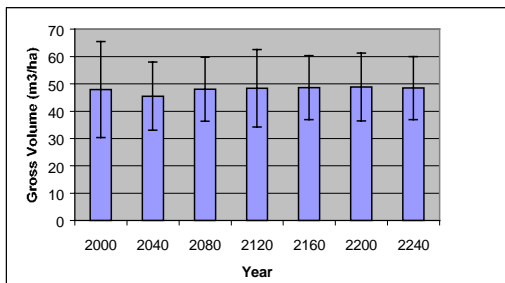
It is widely recognised that there are also many non revenue-producing benefits to be gained from maintaining forest cover – these include biodiversity conservation, watershed protection and non-timber forest products. In production forests the aim should be to maximise these economic benefits whilst producing a sustainable timber yield. Alongside producing timber yield predictions, SYMFOR was also used to give information upon the structure and composition of the remaining forest stand under each alternative Yield Regulation strategy. It was therefore possible to see whether or not a sustainable timber yield corresponded to a sustainable forest – particularly in terms of species diversity, total number of stems and basal area (BA).

¹ Fadillah D, 1996. Model for Minimum Forest Management Unit (Spreadsheet Model), BFMP, Jakarta.

The initial work suggested three realistic scenarios

- a continuation of the current TPTI system
- limiting timber extraction to a maximum of 45 cubic meters per hectare
- increasing the felling cycle length to 40 years.

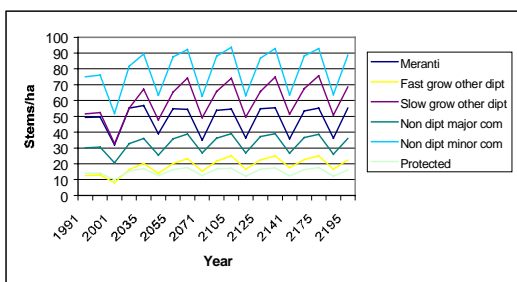
As expected, continuing under the current TPTI regulations was the most financially profitable option. This is because the first timber harvest (from the logged-over area)² was not limited by regulation and therefore more timber was extracted than under the other scenarios. However, timber harvest fell sharply in the second harvest and fluctuated thereafter. The alternative scenarios gave sustainable yields.



Commercial timber yield on a 40 year cycle

An interesting aspect to look at was the actual number of trees being felled per ha under each scenario. The TPTI system was felling an average of 10 stems per harvest, whilst the Yield Regulation systems were felling between 5 and 7 stems (giving the same total harvested volume). This is important for the cost of the harvesting operation and the amount of damage done to the forest during harvesting.

Unexpectedly, the species composition of the forest was not significantly altered under any of the scenarios. The analysis looked at the number of stems in each of the 7 Commercial Groups developed by BFMP (only 6 are shown below for clarity).



Number of stems in the stand broken down by Commercial group (TPTI system)

The pattern seen above was typical of all scenarios, the only difference was in the size of the fluctuations, which were smaller under the two Yield Regulation scenarios. Indeed a major advantage of the 40 year cycle was that the fluctuation in total number of stems and total basal area of the residual stand was much smaller than under either of the other two systems. The basal area recovered to a level very close to that of primary forest within each 40 year period. This is an example of an ecological factor which gives the forest a greater economic value – in terms of improved soil conservation and watershed protection.

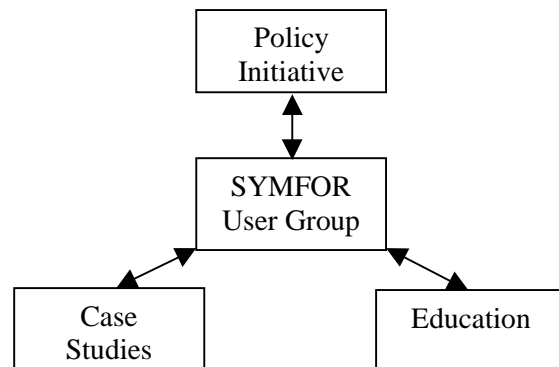
The essence of this work was to recognise and work out how to maximise such economic benefits, whilst maintaining a financially profitable timber yield. Our conclusion was that changing to a 40 year felling cycle would give financial profitability and maximise the economic benefits to be sustained from logged over forest.

Indonesia SYMFOR user group
(Himpunan Pengguna SYMFOR)
 by Paian Sianturi (Bogor Agricultural University)

A recommendation of the SYMFOR workshop (see article by Paul van Gardingen) was the establishment of an Indonesian SYMFOR user group. The intention of the user group is to promote the application of SYMFOR in Indonesia through the production of case studies in other regions of Indonesia, to support policy debate, and to assist curriculum development in Indonesian Universities. It will provide training, distribute results and generally encourage more people to actively take part.

Contacts for the SYMFOR User Group initiative are:
 Paian Sianturi, IPB, Bogor.

p.sianturi@cgiar.org
latin@indo.net.id



The application of SYMFOR to other regions of Indonesia is extremely important in order to extend our findings and understandings to the rest of the country. We already know

² The input data used for these simulations was collected in 1991 in an area lightly logged in 1979.

that the TPTI system needs to be revised based on case studies in East Kalimantan. TPTI is the selective cutting and replanting management system - the current silvicultural guidelines in Indonesia. We don't know how relevant these results are to the rest of the country. Case studies in other regions will be supported through the user group. The first new study has started to analyse information from the province of Jambi in Sumatra.

Contact person for the Case Study initiative is:
Paul van Gardingen, University of Edinburgh
p.vangardingen@ed.ac.uk

The results from the cases studies need to be used to feed the debate on future forest policy within Indonesia. The Indonesian Ministry of Forestry and Estate Crops (MoFEC) is entering into discussion with a wide range of stakeholders in Indonesian Forestry. The work with SYMFOR is seen to support the debate. Within the Ministry this initiative is being developed by Edy Sardjono who has already been involved in producing a number of case studies with SYMFOR

Contact person for the Policy initiative is
Edy Sardjono, Ministry of Forestry, Jakarta.
Fax: +62 (0)21 573 4632

The education initiative aims to support curriculum development in the subject of tropical forestry. This task will be undertaken collaboratively involving several universities in Indonesia. The SYMFOR mailing list (see below) will be used as the basis of communication on developing a working document on curriculum development.

Contact person for the Education initiative is
Herry Purnomo, Faculty of Forestry, IPB, Bogor.
h.purnomo@cgiar.org

SYMFOR emailing group

A mailing list for the group has been established. So far, approximately 40 people have subscribed, most of whom are workshop participants. You can read messages or register for the group on the web

<http://www.egroups.com/group/symfor>

Alternatively send an email request to Herry Purnomo
h.purnomo@cgiar.org

SYMFOR Technical Note Series

From June 2000 the SYMFOR web-site is publishing reports that relate to SYMFOR. The intention is that these reports will:

- provide a forum for scientists from developing countries to publish their work on the international stage,
- form a comprehensive account of studies relating to SYMFOR,
- be known as the "SYMFOR technical note series", with each report having an identifying number.

The web site provides a suitable location for scientific and development dissemination. The acceptance of reports as technical notes will be decided by research staff on the SYMFOR project, who may edit reports before they are accepted. Reports are acceptable both in English and other languages. It is suggested that publication in English will generally have greater impact. It may be possible to publish the same technical note in two languages on the web site. In all cases an abstract in English must be provided.

For more information, please contact us: symfor@ed.ac.uk or visit the current technical note series site on the web, <http://www.symfor.org/technical/>

Project Management and Organisation



The University of Edinburgh

The Growth and Yield Modelling Project is managed by staff at Edinburgh University.

Dr Paul van Gardingen leads the project and is responsible for delivery of outputs, reporting and co-ordination between project partners.

Tel: +44 131 535 4066

E-mail: p.vangardingen@ed.ac.uk

Dr Paul Phillips is responsible for data analysis and development of the SYMFOR framework.

E-mail: paul.phillips@ed.ac.uk

Mr Moray McLeish is responsible for developing applications of SYMFOR, training and economic analysis.

E-mail: moray.mcleish@ed.ac.uk

Ms Tonya Brash is responsible for maintaining the web sites and project administration.

E-mail: tonya.brash@ed.ac.uk

Institute of Ecology and Resource Management:

The University of Edinburgh

King's Buildings

West Mains Road

EDINBURGH EH9 3JG

United Kingdom

Fax: +44 131 667 2601



Forest Research Institute, BPK Samarinda:

BPK Samarinda are responsible for the provision of the datasets and application of the growth and yield modelling system in Indonesia bpk-smd@smd.mega.net.id

Director, BPK Samarinda
Jalan A Wahab Sjahrani Sempaja
Samarinda,
PO Box 1206
INDONESIA
Tel/Fax: +62 (0)541 42037