

THE JSPS FELLOWSHIP FOR RESEARCH  
IN JAPAN

RESEARCH REPORT

Date 14 November 1984

Reported by: A.G.D. Whyte

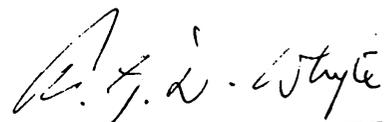
Host Scientist: Dr. M. Minowa

Research Period: From 30 Sept. 1984 To 9 Nov. 1984

Title of Research in Japan:

Mathematical Modelling of Forest Management System

(Signature)



## RESEARCH REPORT

It is with much pleasure that I submit the following Report on my JSPS Fellowship for Research in Japan from 30 September to 9 November 1984. I am most grateful to the Japan Society for the Promotion of Science for the opportunity to visit Japan, to travel through many parts of that country, to see much forestry in situ, to meet many stimulating and kind people and to learn a great deal about Japan's forestry, its foresters and its research scientists. I am also particularly appreciative of the efforts of my host scientist, Dr M. Minowa, in making my trip so informative and enjoyable: he went to great lengths arranging useful contacts with Japanese researchers and forest practitioners, accompanying me on many of the trips pertinent to my research in order to help me to arrive at my various destinations safely, and frequently acting as interpreter. I used up much of his energy and valuable working time during my stay and so it is with heartfelt gratitude that I sincerely acknowledge his invaluable assistance to me. I can only hope that my small contribution to understanding the forestry sector in Japan may be of some use to him and to other Japanese forest researchers and policy makers.

### Itinerary

My daily itinerary can be summarised as follows:

- 30.9.84 Arrived in Osaka, met by Dr Minowa and transported by coach and train to Tsu.
- 1.10.84 Settled in at Mie University, introduction to academic staff of Forestry Department and Dean of Faculty of Agriculture.
- 2.10.84 Preliminary discussions with Dr Minowa and background reading with regard to my research in Japan. Discussion with Mr Yamamoto.
- 3.10.84 Inspection of library facilities. Background reading on research in Japan.
- 4.10.84 Lecture on forestry in New Zealand to staff and post-graduates students at Mie University; discussions with Dr Masuda, Prof. Komamura, Prof. Yoshimura and Prof. Abe.
- 5.10.84 Visit to Mie University Forest with Dr Minowa and Dr Takeda. Lecture on New Zealand forestry to staff there. Discussion with Dr Shimagi.
- 6.10.84 Brief introduction to forestry in Mie Prefecture en route to Toba, and familiarisation with Japanese customs.
- 7.10.84 Sightseeing in and around Toba, visit to Ise shrine including study of use of hinoki timber from Kiso; travelled to Owase City, Miyama.
- 8.10.84 Visit to Hayami private forest, discussions with Mr Hayami, senior & junior, return to Tsu.
- 9.10.84 At Mie University, discussion with Prof. Tobioka on logging practices in Japan.
- 10.10.84 Preparation of material for IUFRO Symposium in Tokyo at Mie University.
- 11.10.84 Travel to Tokyo to IUFRO Symposium venue.
- 12.10.84 Visit to Sato Sawmill, Shinkiba, to see milling of imported logs, then to Tokyo University for discussions with Prof. Nagumo, Mr Naito of Utsonomiya University, Mr Tanaka and Mr Blandon.
- 13.10.84 Sightseeing in Tokyo.
- 14.10.84 Visited Tokyo University and met Dr Konohira. Registration for IUFRO conference.
- 15.10.84 - 17.10.84 Symposium at Tokyo University.
- 18.10.84 Symposium field excursion to Toshuga shrine, Nikko.

- 19.10.84 Visit to Mr Fukuda's sugi plantations at Ukurogawa. Return to Tokyo.
- 20.10.84 Lecture to staff and graduate students of Tokyo University on modelling the forest sector in New Zealand. Visit to Meiji shrine and other sightseeing in Tokyo with Mr Yamamoto, Tokyo University and Dr Sawada, Tsukuba Forest Research Institute.
- 21.10.84 Sightseeing in Tokyo.
- 22.10.84 Visit to Tokyo University Forest in Chiba prefecture with Prof. Kanamitsu, Prof. Nagumo (also Dr Goulding & Dr Garcia of New Zealand and Dr Rudra, Australia).
- 23.10.84 Further inspection of permanent sample plots with Prof Nagumo. Return to Tokyo. Discussions with Drs Okuma, Miwa and Mishiro of Tokyo University.
- 24.10.84 Discussion with Mr Mashita, Sumitomo Forestry, on computer mapping. Travelled to Hokkaido with Dr Minowa, and visited Tokyo University Forest at Yamabe.
- 25.10.84 Tour of Tokyo University Forest with Lecturer Shibata and Dr Kurahashi. LECTURED on New Zealand forestry to University Forest staff.
- 26.10.84 Travelled to Tomakomai to visit Hokkaido University Forest. Visit to forest and discussions with Drs Ishigaki and Funakoshi.
- 27.10.84 Visit to Oji Pulp and Paper Mill at Tomakomai. Returned to Tokyo and travelled to Ina, Nagano.
- 28.10.84 Visit to Akasawa Forest, Kiso with Dr and Mrs Konohira.
- 29.10.84 Visit to Japan Forestry Agency in Ina, lectured to staff and graduate students of Shinshu University about forestry in New Zealand.
- 30.10.84 Travelled from Ina to Fukuoka. Met with Dr Minowa on the way.
- 31.10.84 Visit to Yame Private Forest in Kyushu prefecture with Prof. Nishizawa, Prof. Takeshita and Dr Minowa.
- 1.11.84 Visit to Kyushu University Forest with Prof. Nishizawa, Prof Cho and Dr Minowa.
- 2.11.84 Travelled to Nagoya, lectured on forestry and stand growth modelling in New Zealand to staff and students of Nagoya University. Discussions with Prof. Suzuki, Dr Nagashima, Dr Umemara and Dr Sueda.
- 3.11.84 Discussion with Dr Sueda. Returned to Tsu.
- 4.11.84 Began digestion of research material and analysis of findings during tour of Japan.
- 5.11.84 LECTURED to undergraduate students at Mie University on forestry in New Zealand. Continued analysis of research data.
- 6.11.84 Preparation of first draft of Research Report. Discussions with Prof. Tobioka, Prof. Nagata and Dr Takeda.
- 7.11.84 Travelled to Tokyo, discussions with Prof. Ishida and Dr Minowa.
- 8.11.84 Discussions with Dr Minowa on draft report and visit to JSPS (Mr H. Kobayashi).
- 9.11.84 Visit to Forest Research Institute, Tsukuba. Discussions with Dr Nishikawa, Mr Amano, Dr Uhnuki and Dr Sawada. Travelled to Narita. Returned to New Zealand.

I travelled extensively throughout Japan in an attempt to gain a good visual impression of various forest types found in different regions, and to meet as many researchers and practitioners as time allowed. The approximate total transportation expenses I incurred in these travels amounted to about 157,000 Yen, a bit more than JSPS allocated, but I believe the sum represents a good investment for the success of my research. The amount would have been even higher but for the generosity of several people, particularly Dr Minowa, Prof. Nagumo, Dr Konohira and Dr Sueda.

### Academic Activities

My academic activities were concerned largely with the exchange of both information and research methodology pertaining to modelling the New Zealand and Japanese forestry sectors. Researchers in each of our two countries have only recently, mainly because of language difficulties, acquired some mutual understanding of our respective scientific work. I have tried, therefore, as can be seen from the lectures I gave noted in the above itinerary, to provide some insight to Japanese audiences of the nature of forestry policy, practice and research in New Zealand. Conversely, I have gained much from the informal discussions I have had with forest researchers and practitioners throughout Japan, particularly where field visits were made, as there is no adequate substitute in forest management research for first hand inspection of practices. My other main academic activity was attendance at the IUFRO Symposium on Forest Management Planning and Managerial Economics at the University of Tokyo, where I presented a paper on my research methodology for characterising the New Zealand forest sector ( a copy of which is attached to this report) and also chaired a Session on Forest Management Planning in which 3 Japanese forest researchers and 3 Japanese forest practitioners presented papers on private forestry in Japan; along with three other speakers dealing with forestry in other countries. Chairing this session gave me very important insights which I shall discuss more fully in the next section.

### Impressions on Present State of Science in Japan

Successful modelling of a forest sector in any country involves bringing together theoretical specialists from several disciplines as well as forestry and forest industry practitioners, policy makers and politicians: it also requires extremely large quantities of basic data, including (1) areas of forest by species, locality and age; (2) yielding capability by log or outturn product assortments; (3) product mix options; (4) market (or demand) forecasts; (5) logging and transport implications; (6) manufacturing production coefficients; (7) energy budgets; (8) capital investment needs; (9) infra-structural implications such as vehicles, machinery, roads, ports and shipping; (10) labour requirements; (11) environmental and social constraints; (12) linkages with other sectors.

I have examined a considerable amount of theoretical research in Japan of very high quality on several of these topics. Co-ordinating the many component parts, however, seems to have been rather neglected, perhaps because too few staff have been formally allocated, to this task, while a few informal enthusiasts such as Mr Amano, Dr Konohira, Prof. Nagumo, Prof. Nomoura and Dr Minowa have experienced practical difficulties in encompassing the whole field. One outcome of this has been a very large difference between actual and planned domestic wood supplies. There are 2 main factors which have led to this discrepancy: (1) the drop in prices of timber over the last six or seven years has acted as a disincentive to private owners to cut their forests as planned; and (2) the growth and potential productivity of Japan's plantations, including those belonging to the Japanese Forest Agency, has possibly been overestimated, particularly because of the lack of intermediate thinning to improve the quality and promote the growth of the trees remaining after treatment.

These circumstances make it very difficult for researchers to produce accurate predictions about future potential wood supplies which could be helpful to policy and decision makers and to politicians. The present research being done by Dr Minowa in providing growth models for sugi will be of considerable assistance

in characterising the forest sector, as his models appear to be soundly based in terms of mathematical and biological theory, and are to be validated against actual production, including the influence of thinning. Similarly, the work of Dr Konohira, Prof. Nagumo and Mr Amano, in which models that bring together both supply and demand and are related to actual production, needs more encouragement and support.

It seems to me that, in the past, too much emphasis has been given in Japanese forest management research to placing the forest first: that is, the supply models are geared to providing a theoretically desirable forest structure rather than a more balanced practical consideration of the wide range of functions which a forest should fulfil. I believe that this narrow view has had an adverse effect on shaping and using Japan's forest resources, particularly the plantations. In discussions, however, some Japanese scientists have supported the suggestion to improve co-ordination of planning the use of the forests resources within Japan. Moreover, the IUFRO Symposium provided a forum at which it became apparent that forest sector planners in Pacific Rim countries need to keep constantly in touch with developments in the planned use of forest resources in this region. Japan is a key country in this regard because it is currently reliant on log and wood imports for over 60% of its wood needs, and because it plans to become a little nearer self-sufficiency proportionately though not necessarily in absolute cubic metre amounts. The opportunity to provide a rational framework for research planners in Japan, North America, Russia, the South Seas countries, New Zealand, Chile and perhaps even Fiji to work within should be encouraged.

One aspect of the supply and demand data for Japan that needs further strengthening is a more detailed breakdown of the kinds of wood required, particularly the specification of sawn timber categories. This problem is exacerbated by different standards of utilization practice in different parts of Japan. I shall try as part of my continuing co-operative research with Dr Minowa over the next few months to provide a broad indication of such detailed data for Japan as a whole. Dr Minowa and I have agreed informally to co-operate in this way. I would be most happy, however, to widen the net of co-operation if that is possible and desirable. I believe it is desirable, for the mutual benefits of each of our countries in rationalising wood imports to Japan and wood exports from New Zealand.

The other aspect of my research that has been of interest is private forestry. There appears to be a large gap between research and practice in this context, despite useful work by Dr Minowa, Prof. Nagumo, Mr Amano and others. This was highlighted also at the IUFRO Symposium at which some very good practical research done by private owners was presented. I was informed that there were few opportunities for practical and theoretical researchers to come together, and so I hope that the benefits which emerged from that particular forum in communicating ideas between the two groups will be pursued in the future.

There does appear to be a problem in this connection, because of Japanese customs. At the symposium session I chaired, several different points of view were independently expressed, each with a measure of individual validity. Trying to compare and contrast their contributions collectively, however, was not possible because of cultural custom and because of different historical traditions. I believe that this custom of neither comparing nor contrasting scientific points of view in public is having an adverse effect on implementing research, and I wonder if scientific organisations within Japan could undertake a programme of encouragement of free and frank discussions of their research at symposia,

conferences, etc., at least within the scientific community and preferably among practitioners as well.

Comments on JSPS Fellowships

If my recent experience is a good indication, the gains in mutual understanding of scientific disciplines in different countries through Research Fellowships are great. I have only praise, therefore, to offer in support of the aims of JSPS fellowships. If I can make one comment, I think it may be of help to visiting researchers if some further guidance on scientific etiquette in Japan was given before Fellows arrive in Japan. I received some help on general matters of this kind from the Japanese consulate in New Zealand, but not on scientific aspects specifically.

Comments on Japan

I enjoyed my visit to Japan immensely. Although the country is much more densely populated than my own, it was not difficult to adjust to the crowds, as I found Japanese people to be considerate, courteous and concerned about a healthy environment. I liked Japanese food very much, and was particularly impressed with the care and artistic flair used to present it so attractively. I would have benefitted more if I had been able to learn the Japanese language, but mostly I could communicate reasonably well with English and sign languages. I am, therefore, very keen to return to Japan some day to learn more about the country and to be a recipient once more of the magnificent hospitality lavished on me during this last stay.

AGD WHYTE  
12.11.84

Enclosed Photograph of Fellow standing beside healthy and diseased *Pinus densiflora* in Mie Prefecture on 6 October 1984.

