



New Frontiers of Forest Economics: Forest economics beyond the perfectly competitive commodity markets[☆]



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ABSTRACT

The paper provides an overview of the papers included in this special issue, and presents thoughts about New Frontiers of Forest Economics. The paper argues that science does not mean analysis alone; it should be complemented by synthesis and forest economics is a promising field to rediscover synthesis as a methodology of science. The paper sets the goal of boundless profession of forest economics and suggests three key areas of research: (i) economic models that interweave other-regarding and non-cooperative self-interest preferences; (ii) rigorous analysis and synthesis of externalities and development of new economic approaches to address the diversity of interrelated property rights of complex ecosystems; and (iii) treating markets and political institutions as entangled institutions.

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1. Introduction

In 2011, a working group on the New Frontiers of Forest Economics (neFFE) was formed by Peter Deegen, Martin Hostettler, Shashi Kant, and Sen Wang. The group organized the first International Conference on the New Frontiers of Forest Economics, June 26–30, 2012, at ETH, Zurich, Switzerland. The group's second International Conference on the New Frontiers of Forest Economics: Forest Economics beyond the Perfectly Competitive Commodity Markets was organized at Peking University, Beijing, China, from August 18 to 23, 2015. The conference was hosted by Prof. Jintao Xu at the National School of Development, Peking University, China. The conference was supported by Environmental Economic Program in China (EEPC), National School of Development, Peking University, and co-sponsored by the Rights and Resources Initiative (RRI) and the Environment for Development (EfD) Initiative.

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The goal of the conference was to continue the work on forest economics for the 21st century that started at the first neFFE conference at ETH, Zurich, Switzerland. Two key objectives of the conference were: (i) to bring together leading thinkers in forest economics from academia, government, and organizations related to the forest sector to explore thought-provoking perspectives on forest economics beyond the boundaries of perfectly competitive commodity markets, and (ii) to provide a unique forum to present and discuss cutting-edge thinking papers that will enrich and provide future directions to the discipline of forest economics.

Similar to the first conference, the number of participants was restricted to 40, and only 13 papers (2 invited and 11 chosen through a rigorous selection process) were presented. All chosen papers in full length were submitted before the conference, and each paper had two discussants. The presentation by the author of each paper was followed by the presentation of two discussants' reports and open discussion with other participants. Hence, there was a thorough and lively discussion of each paper. After the conference, the authors were given the reports of the two discussants and editors' suggestions/observations on their papers, and they were asked to revise their papers in view of these observations and the observations of the participants during the discussion. We received 11 revised papers that are included in this

volume. In addition, after the conference the authors of three papers that were presented as posters were asked to submit their full manuscripts. Each of these three manuscripts was reviewed by two referees and one guest editor and the authors revised their papers as per suggestions of two referees and the guest editor.

The papers included in this volume are the revised papers. Similar to the special issue of Forest Policy and Economics that included the papers presented at the first neFFE conference, we are including the reports of two discussants of each paper. The discussant reports were prepared for the first draft of every paper, and therefore the discussant reports provide some idea about the evolution of papers. The combination of the final paper and two discussants' reports may be more enriched reading rather than the reading of the final paper only. The anonymous reviewer's reports are not included to maintain their anonymity.

The papers included in this volume provide multiple perspectives about the New Frontiers of Forest Economics. In addition, many discussants and other participants contributed their thoughts towards the New Frontiers of Forest Economics. Hence, the remainder of this paper is divided into three sections. First, a brief overview of the papers included in the volume is provided. Second, a synthesis of collective perspectives of the conference about new frontiers is presented. Conclusions and acknowledgements are presented in the final section.

2. Overview of the papers included in this volume

The volume starts with Khan (2016-in this issue). In this paper, the author makes a bold attempt to address the tensions between two communities – economists and foresters. The paper attempts to develop an understanding of the basis of tensions and lines of communication to dispel tensions. The author uses economic-anthropological inquiry and mathematically-focused inquiry to achieve his objectives. The author raises some key questions. Are there autonomous principles of forest science? How complementary or substitutable are the principles of forest science for the principles of economic science? Is it all a question of common-sense, or are there different perspectives, different communities, each with its own irreconcilable cultural and political stance, each straining for toleration and accommodation of its other? The author attempts to answer these questions through the readings of Samuelson (1976) and Mitra and Wan (1985, 1986); and he views one in light of the other and use Muir-Pinchot rivalry as the hinge between these two texts. The author concludes that the disagreement is around conceiving a forest as an instrument to be exploited for a society's needs or as something beyond a purposive calculus, optimization, and economics itself. The author suggests many frontiers of forest economics including economics of sustainability and extinction, dovetailing the economics of forestry with environmental economics and the economics and the politics of climate change, Austrian-Wicksellian capital theory, and stochastic capital theory.

In the second paper, Sohngen and Tian (2016-in this issue) present an economic analysis of global climate change impacts on forests and markets. They start with a demonstration of foresters' adaptation to important supply and demand driven shocks that affected timber prices and forest investments in the last century. Typical examples are the changing rotation ages, the increasing intensification of forest management and the movement of species across regions to find better growing conditions. Many of the adaptations that foresters have made will be of the same type as adaptations that foresters will be asked to make by the society in the future in order to adapt to climate change. To consider the implications of climate change, the authors present the results of an integrated assessment analysis that link a dynamic global vegetation model with a global forestry model. The projections show that climate change decreases global timber prices by 15% relative to the baseline, increases the area suitable for forests globally and increases the global growing stock volume per hectare. The authors conclude - while climate change will alter the future, it looks as if the trajectory of forest management techniques to slowly increase global forest stock will continue.

The next three papers are focused on *behavioral economics and its applications to forestry*. In the third paper, Valatin et al. (2016-in this issue) observe that there is enough evidence from behavioral economics to suggest that cognitive factors affect preferences, values and choices of individuals, and policy 'nudges' can influence individuals' decisions in ways that help achieve societal goals. The insights from behavioral economics can be critical for some key elements of forest economics such as the estimation of non-market values of ecosystem services using stated preference techniques. The influence of cognitive factors on values poses a fundamental challenge to economists to develop a valuation framework that allows/incorporates the social endogeneity of preferences in protocols/objectives such as maximization, satisficing, and cost-effectiveness in ensuring safe minimum standards, or in pursuing a rights-based approach. After this introduction, the authors discuss the role of nudges in shifting choices in socially desirable directions and provide evidence from literature. The authors disaggregate behavioral elements of woodland creation using the Stages of Change model and suggest a number of relevant intervention points at which nudges could be applied to encourage woodland creation to help meet climate change mitigation and adaptation goals. The authors suggest that differences in attitudes, circumstances, motivations, and behavior must be incorporated to design nudges for different types of land managers, and pilot studies should be conducted to identify cost-effective nudges. The authors present a strong case for behavioral economics including testing out nudges being an important frontier of forest economics and policy.

In the fourth paper, Kumar and Kant (2016-in this issue) explore the role of revealed social preferences in the outcomes of Joint Forest Management (JFM). The authors present a game theoretic model of JFM and discuss the role of self-interested, altruism, commitment, and reciprocity in JFM outcomes. The authors organized a public good game in five villages of central India to identify social preferences of villagers in each village and measured the state of JFM using 4 criteria and 3 indicators for each criterion. The village-level average allocations to public good game and the JFM outcomes are highly correlated. Villager's preferences are reciprocal in two villages which had high success in JFM while villager's preferences are commitment in three other villages which had moderate to low success in JFM. The authors do not find any significant variation in social preferences across demographic, economic, and social characteristics of villagers. The authors argue that social factors, used by other authors (Kant, 2000; Lise, 2000) to explain JFM outcomes, affect the social norms of individuals and social preferences are the manifestation of evolved social norms in any given social group. Hence, the authors support the case of behavioral economics being an important frontier of forest economics.

The fifth paper is by Kant et al. (2016-in this issue), and this paper extends the boundaries of non-market valuation methods used in forest economics by using the life-satisfaction approach (LSA) to value social, cultural, and land use (SCLU) activities of First Nations people of Canada. The authors argue that the LSA overcomes problems associated with conventional stated-preference methods, such as problems of hypothetical nature of questions, unfamiliarity of the task under valuation, and strategic behavior of respondents, and revealed preference methods, such as the absence of market equilibrium; the degree of market capitalization; and the effects of risk perception distortions. In addition, the LSA does not rely on the assumptions of rationality and perfect information. The authors use a two-layer multi-domain model that includes Financial, Health, Housing, and SCLU domains. The data for model estimation were collected from a First Nation in Ontario, and participatory methods were used for data collection to avoid category fallacy. The authors use three methods – Z factor, 2SLS, and 3 SLS – to address the problem of endogeneity. The SCLU domain contributed more than twice the financial domain to general satisfaction (GS). SCLU activities, such as trapping days, gathering days, traditional diets, quality of time spent on gathering and trapping, and satisfaction with land laws made significant contributions to general satisfaction. The results empirically confirm the view of the First Nations about the importance of SCLU

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