

Project Statement

BC Coastal Forest Sector Development Initiative

Program	Harvesting and Conversion
Project Title	Decision Support Tools for Industry Competitiveness
Project Number	H.08
Project Leader	Mustapha Ouhimmou
Project Team	Ibrahim Karidio, Sophie D'Amours, Alain Martel and Mikael Rönnqvist
Start Date	October 1, 2007
Completion Date	March 31, 2009

Rationale:

Paprican, together with the Forac research consortium at Université Laval, has developed a decision support tool which identifies strategies for generating maximum value from available fibre supplies. This tool uses wood quality information, together with known relationships between wood and fibre properties, processing costs, process productivities, and product quality, to establish the economics of potential fibre allocation and processing options. The delivered fibre costs and end-product values associated with each of these options determine which utilization plan is most profitable under specific fibre supply and market conditions. This tool has been used to optimize fibre procurement plans, product range and product recipe compositions, and production volumes for individual pulp and paper product manufacturers. It has also provided a basis for the development of a second tool which uses a similar approach (but with considerably less process-level detail) to optimize fibre utilization plans within manufacturing networks. These networks may include lumber and engineered wood product manufacturing, energy generation, and pulp and paper product manufacturing centres. Certain aspects of this second tool (such as how it handles transportation synergies) could use some improvement.

Within the context of the BC coastal forest sector development program, this tool can be used – together with cost, market size and revenue potential information – to assess the economic potential of new harvesting, transport and processing systems, novel grading and sorting schemes, and new and existing product-market opportunities. It can also be used to establish which opportunities for matching wood quality attributes to processes and end-products hold the greatest potential for different segments of the coastal hem-fir resource.

FPInnovations is also actively exploring opportunities for transforming the industry by shifting its focus from traditional commodity products to next-generation pulp and paper products, next generation building solutions, bioenergy, biofuels, specialty chemicals, and nano-crystalline cellulose. The economics of these new opportunities and their interactions with existing fibre supply, manufacturing, logistics, and market structures have yet to be established. The effects of government policies and the impacts of fibre supply

and market uncertainty have also yet to be explored. Developing a decision support framework which addresses these issues – especially within the context of new product-market opportunities and the integration of the extended forest products manufacturing network – would represent a significant step towards defining how government policy and industry strategy can enhance competitiveness.

Key Objectives:

- To define the decision support requirements for the BC coastal forest sector within the context of the development program
- To provide decision support tools for evaluating the economics of new systems, strategies and opportunities, and for defining the effects of government policy and industry strategy on forest sector competitiveness
- To use these tools to assess the economic potential of new harvesting, transport and processing systems, novel grading and sorting schemes, and new and existing product-market opportunities for the BC coastal forest sector
- To use these tools to analyze the effects of government policy and industry strategy on the competitiveness of the BC coastal forest sector

Project Methodology:

A significant proportion of the work proposed under the BC coastal forest sector development program will focus on identifying opportunities for improving harvesting, transport and processing operations, matching wood quality attributes to processes and end-products, and harnessing the market potential of new and existing products. This information, together with the associated costs, market sizes and revenue potentials, will be translated into parameters for input into the decision support tools. The tools will then be used to evaluate the economics of the opportunities, define the conditions under which they are viable, and identify which combination of opportunities provides the greatest value for different segments of the BC coastal hem-fir resource.

The decision support tools used and developed through this work will be based on mathematical programming models. These models provide an efficient mechanism for analyzing and optimizing very complex decision networks (such as those that make up the forest sector value chain). The modeling methodologies required for these tools have already been developed and implemented by FPInnovations-Paprican and others, and collaboration with the Forac research consortium and the Norwegian school of economics and business administration will bring together the expertise of some of the world’s leading experts in this area.

Project Milestones:

Activities	Planned Completion Date
Develop and validate a prototype of decision support tool based on the current network modeling framework using mathematical programming approach	July 2008
Add details around new product opportunities (including bioenergy and biorefinery products) to existing decision support tool	September 2008
Develop and validate a prototype of decision support tool based on this new modeling framework using mathematical programming approach	December 2008
Develop new modeling frameworks to address the impacts of uncertainty (fiber supply and market) on competitiveness of the BC coast forest sector	March 2009
Publish a year-end report summarizing the activities conducted and results achieved	March 2009

Key Deliverables:

- An economic analysis of the opportunities identified under the BC coastal forest sector development program
- A decision support tool that can be used for ongoing analysis and optimization of fibre allocation and processing strategies, capital investment plans, and product-market opportunities.
- An analysis of the effects of government policy and industry strategy on the competitiveness of the BC coastal forest sector
- A decision support tool that can be used for ongoing analysis of the interaction between government policy and industry strategy and their impacts on competitiveness

Expected Long-term Outcomes:

The work described above will provide a system for defining how the BC coastal forest sector can use the hem-fir resource – in combination with new strategies, technologies and product-market opportunities – to re-establish its competitive position. This system will also be applicable to the broader Canadian forest products sector. FPInnovations will work with its industry and government partners to facilitate the use of the system and the implementation of analytical results.

Potential Impact:

Using the tools and analysis provided in the work described above will enhance industry competitiveness through improved decision-making.

Collaboration:

Forac research consortium, Université Laval
Norwegian school of economics and business administration

This project also links across the BC Coastal Initiative projects in all program areas.