An investigation of the economic potential of Short Rotation Forestry for fibre and fuel in Ireland

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What is Short Rotation Forestry (SRF)?

- Single trees of fast growing species.
- Reduced rotation length compared to conventional forestry.
- Primarily for the production of biomass or fibre.
- Between short rotation coppice systems and conventional forestry.

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Why should we do Short Rotation Forestry?

- Ireland's renewable energy targets 16% by 2020 (2009/28/EC).

(Renewable energy was 7.8% of Gross Final Energy Consumption in 2013)

SRF→ Assist in achieving renewable energy targets.

- Wood energy supply gap likely to be 1-1.25 million m^3 per annum*.

Year	Demand (million m^3)	Available (million m^3)	Gap (million m^3)
2011	1.59	1.07	0.52
2028	3.08	1.75	1.33

SRF→ Reduce the predicted shortfall in supply of timber for biomass

*Phillips, H. (2011) *All-Ireland Roundwood Production Forecast 2011 - 2028*. Dublin.

Forest policy

Already promoting afforestation for fuel and fibre.

Irish Forestry Programme 2014-2020.
Grant and Premium Category:
Forestry for Fibre*

Eligible species:

- Italian alder
- Hybrid aspen
- Eucalyptus
- Poplar

*Forest Service. Department of Agriculture Food and the Marine (2014) *Forestry Programme 2014 –2020: Ireland*.

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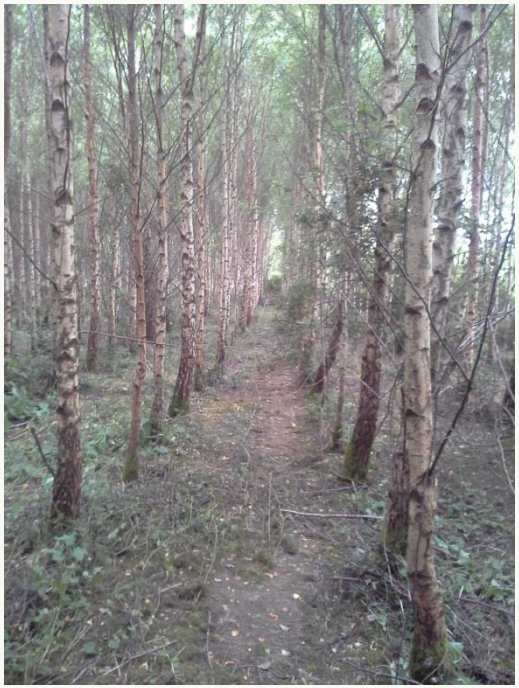
Research question:

What is the financial value of Short Rotation Forestry in Ireland?



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Objectives:

1. To develop a **unit conversion tool** to quantify wood resources for different markets.
2. To assess **the market requirements** to fibre and energy from SRF plantations in Ireland.
3. To explore how to **optimise** the value of the SRF plantations in Ireland.

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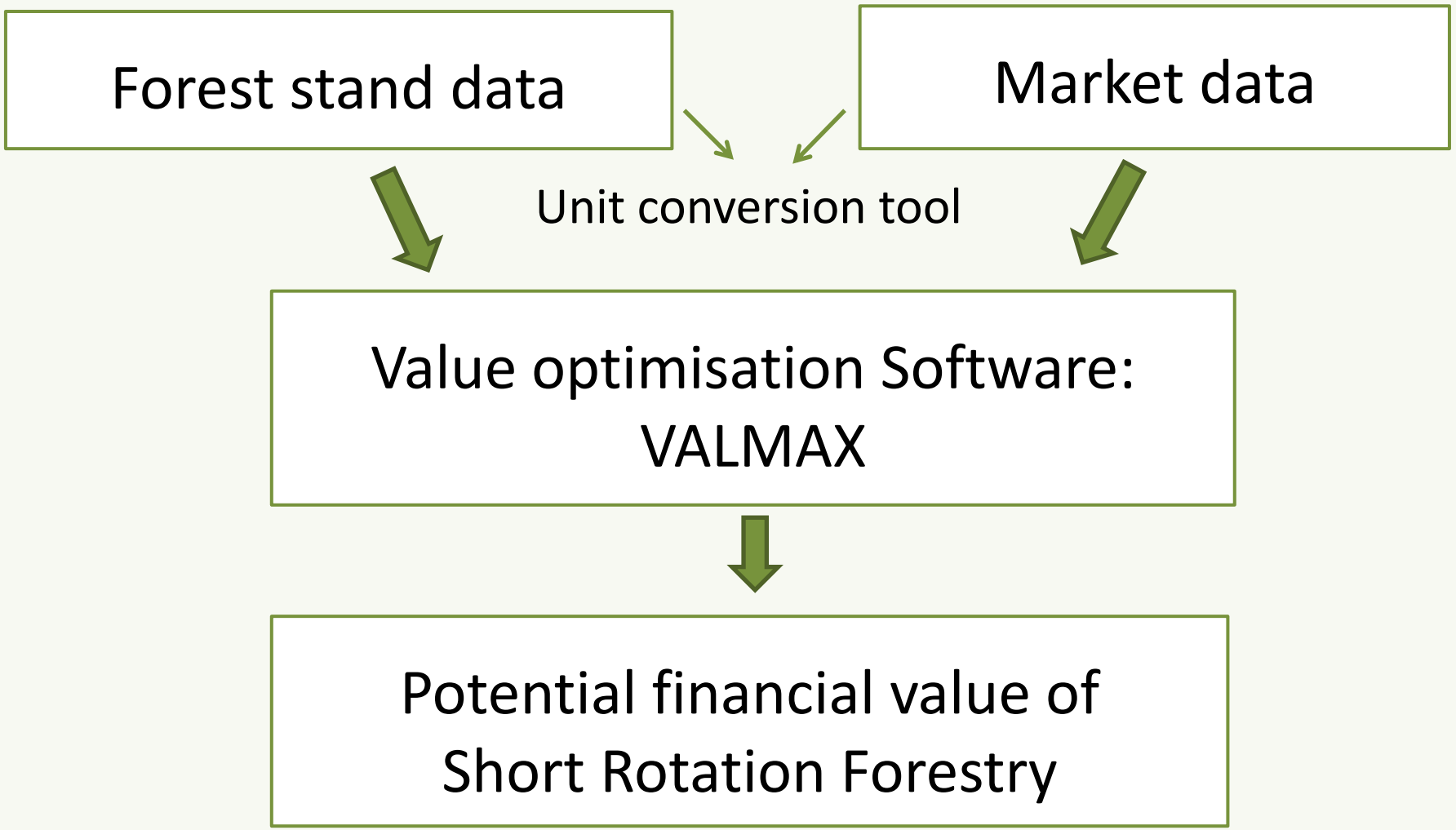
Conceptual framework



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Stands data collection

Detailed assessments by:

- Measuring volumes
- Taking destructive samples from target trees to determine tree biomass parameters :

- Biomass expansion factors
- Moisture content
- Basic density
- Ash content
- Calorific value

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Market requirements assessment

Data collection of competing markets:

- **Price** paying potential
- Allowable **material specifications** of different tree partition assortments

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Unit conversion tool

How can we quantify wood resources for different markets?

Solid volume: m^3

Weight: Green tonnes

Bulk volume: m^3
Dry weight: Oven dry tonnes
Calorific value: GJ Kg^{-1}, MWh

BulK volume: m^3
Dry weight: Oven dry tonnes

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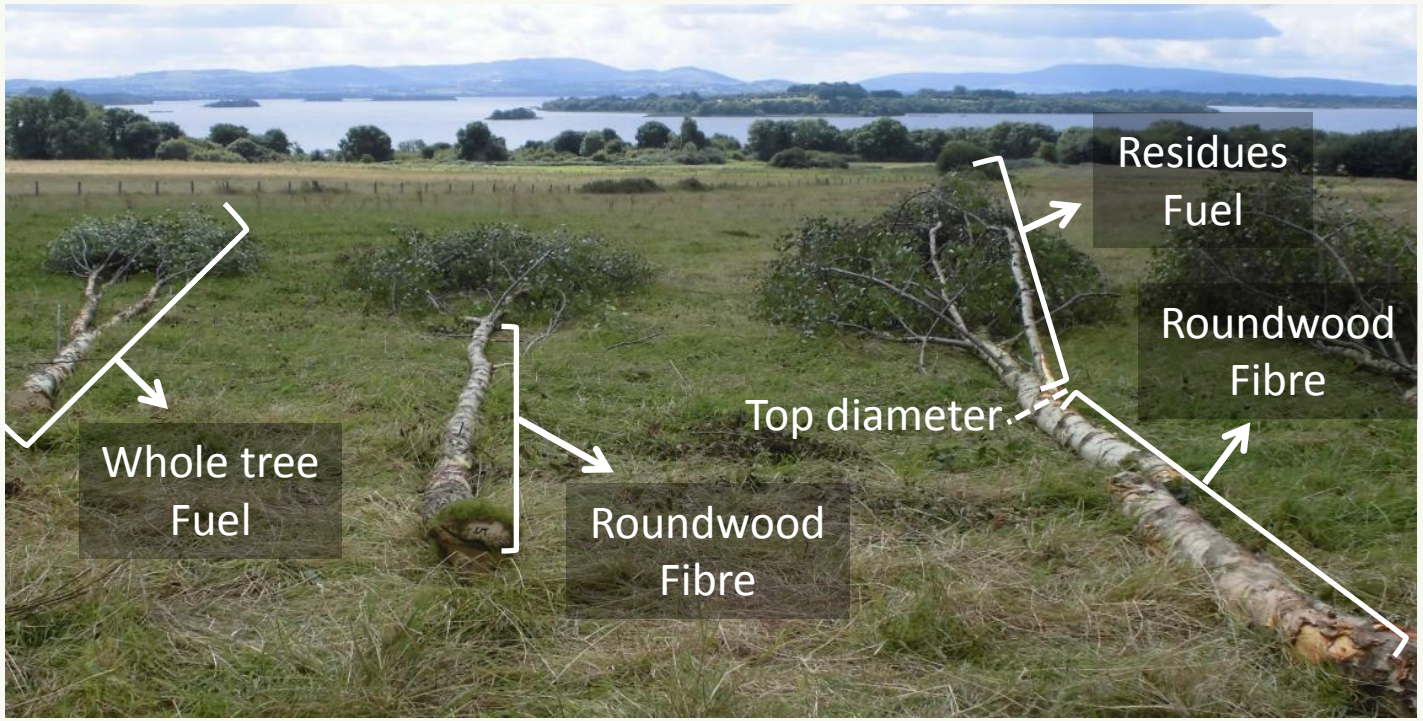
Value optimisation

Value optimisation Software: VALMAX*

- Optimal log-making algorithm
- Optimally allocate wood products from forest to market



*Murphy *et al.,*2010. Management tools for optimal allocation of wood fibre to conventional log and bio-energy markets in Ireland: a case study. *European Journal of Forest Research.*

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Value optimisation

Value optimisation Software: VALMAX (Value Maximisation)

Bucking optimisation: producing logs from tree stems aiming to get the maximum value of them.

Bucking to value:

- **Stem level** → maximise the value of each individual tree.
- Best situation for the **forest owner** → market will take the amount of each log type produced whatever is the volume of each.

Potential financial value of Short Rotation Forestry

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