Cost-effective short-wood logging cable way system for low land stands

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Egological valueable low land stands with sensitive forest soil

wheel based machines not applicable, cable way systems?

Tests with alpine equipment showed:
costs for harvesting  proceeds of wood.
Points of criticism

- Long during dangerous setting-up time
- Not standardised

Productivity and operating costs
Sliding transport of longwood causes damages on soil and forest stands

Quiet slow transport

dimished productivity
Required anchor trees are commonly damaged, have to be cut

Positioning is dependent from the existence of adequate anchor trees

Either the safety-factor of machines is too huge, or hauled load is too small

Expensive machines → low productivity, high operating costs
Special machines are too special, too expensive in purchasing and operation.
Classes of passability in month of November

<table>
<thead>
<tr>
<th>Class of Passability</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>passable</td>
</tr>
<tr>
<td>T2</td>
<td>limited passability</td>
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<tr>
<td>T3</td>
<td>severely limited passability</td>
</tr>
<tr>
<td>T4</td>
<td>barely passable</td>
</tr>
<tr>
<td>T5</td>
<td>impassable</td>
</tr>
</tbody>
</table>
Great Britain's district of "Scotland", ca. 1,000,000 ha of forest

- England, ca. 1,000,000 ha of forest
  - 8.600,000 m³ of wood
  - Maximum potential of units: 430

- Germany, ca. 11,200,000 ha of forest
  - 5.300,000 m³ of wood
  - Maximum potential of units: 263

- Estonia, ca. 2,700,000 ha of forest
  - 10.700,000 m³ of wood
  - Maximum potential of units: 583

GIS-based potential study

5.300,000 m³ of wood
Maximum potential of units: 263

10.700,000 m³ of wood
Maximum potential of units: 583
- Conventional 3-rope-cable-way system
- 7 points of innovation with synergistic effects
- 4 patents

- Abdication of natural elements as anchor or tower
- Quick, simple and cheap transport
- Flying transport of shortwood
- Free standing dead-end-tower, 400 m far from forest road
- 400 m without saddle
- Enabling of calculation of safety factor
- Increased productivity because of diminished dead-time of carriage and forestry worker
- Modular construction
- Adjusted to boundary condition onside low lands stands - sensitive forestry
Tension of assembly

Sag of skyline
Dynamical analysis

Antimetric and metric natural frequency of the cable way system and worst case in vibrational response
Deflection

Acceleration in result of oscillation
Proportional view, central maximum load

Maximum load and weight of carriage = 1250 kg
Mass of skyline (D = 20 mm) = 716 kg
Tension of assembly = 78.3 kN
Maximum sag = 11.7 m
Sag of slack rope = 2.6 m
• All at once: bundle of wood is hanging directly below the carriage AND avoiding of dead-times while hitching
• No engine to spool-out, steering from the active tower
• Two stroke ropes
• Passive and light
• Use of a minimum of ropes
• Adapted for the boundary conditions of low lands
»Wissen schafft Brücken.«