Forestry plays an important role in Ukraine's economy. The paper considers the logistics of logging and the choice of timber transportation route from logging companies A and B to logging factory C. Depending on the value of transport costs, the optimal route of timber is found. Issues of freight traffic in the city are considered in [1].

Let a given forest strip be \( l \). At the ends of the forest strip there are two logging enterprises A and B. Delivery of 1 m\(^3\) of wood from one running meter of the forest strip from point A – \( p \) UAH/m\(^3\), and from point B – \( q \) UAH/m\(^3\). The cost of extracting 1 m\(^3\) of wood from one running meter of forest belt is – \( K \) UAH. What proportion should the forest strip be divided to optimize the cost of extraction and delivery of all timber?

The cost of the first section with the length \( a \) is: \( A_1 = K \frac{a^2}{2} \) UAH.

Delivery to the factory from point A is \( pma \) UAH. (\( m \) – coefficient depending on the amount of wood on each meter of the forest strip). Similarly, the costs of the second site are \( A_2 = K \frac{(l-a)^2}{2} \) and the delivery – \( qma \). Total cost of extraction and delivery of 1 m\(^3\) of wood:

\[
S(a) = \frac{K a^2}{2} + pma + K \frac{(l-a)^2}{2} + qm(l-a) .
\]

Minimum \( S(a) \) is achieved at \( a = \frac{1}{2} \left( l + \frac{m(q-p)}{K} \right) \) provided that \( m|q - p| \leq l \).
Find the difference between the optimal strategy and the case when only one logging company operates, for example, company A (if \( p \leq q \)). Then the optimal cost of extraction and delivery of 1 m³ of wood is:

\[
\frac{K}{4} \left( l^2 + \frac{m^2 (p - q)^2}{K^2} \right) + \frac{ml}{2} \left( p + q \right) - \frac{m}{2K} \left( p - q \right)^2.
\]

And the delivery of 1 m³ timber from point A is \( \frac{Kl^2}{2} + pml \).

Thus, the economy will be:

\[
\frac{K}{4} \left( l^2 - \frac{m^2 (p - q)^2}{K^2} \right) + \frac{ml}{2} \left( p - q \right) + \frac{m}{2K} \left( p - q \right)^2.
\]

If the capacity is proportionally placed between enterprises A and B, then the forest strip will be processed in the shortest possible time. Issues of business management of agricultural enterprises are considered in [2].

The result of the research can be summarized as an arbitrary number of forests and logging companies. This will optimize the cost of logging and delivery of wood to logging factories.

References:


DOI 10.36074/24.07.2020.v2.02

**DEVELOPMENT OF RESOURCE-SAVING TECHNOLOGIES FOR PROCESSING WOOD WASTE FOR THE PRODUCTION OF ALCOHOLIC BEVERAGES**

**ORCID ID: 0000-0001-9321-6684**

Oleg Kuzmin
Candidate of Technical Sciences, Associate professor
Department of Technology of Restaurant and Ayurvedic Products
*National University of Food Technologies*

**ORCID ID: 0000-0001-8010-8844**

Volodymyr Isaienko
Candidate of Technical Sciences, Doctor of Biological Sciences
Professor, Rector of the National Aviation University
*National Aviation University*

UKRAINE

Waste reduction is a key challenge for the sustainable development of the food industry, so reducing it is a pressing issue for most businesses in the industry. Waste recycling and utilization is a strategic goal for each company, which involves the involvement of innovative technologies based on the evaluation of decisions in