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TIME STRUCTURE OF WORKING DAY WHILE PERFORMING WOOD HARVESTING - ECONOMIC VIEW

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A characteristic feature of the process of wood harvesting in many European countries is dispersion of tasks on a relatively large area. This is due mostly to the area structure of forests and principles of silviculture applicable in most of countries that significantly limit unit area of cutting. The economic effect of such a situation is the improper use of working day, which in turn becomes cause of increase in unit costs of wood harvesting and skidding. A detailed analysis of problem based on real data from the selected area will allow to develop a method for calculating the cost of carrying out the tasks and can provide the basis for better tasks planning, ensuring costs reduction. Observations of harvesters working in the Polish forests led to distinguish following stages of task performing: transfers between machine bases and places of tasks execution, transfers between consecutive areas of tasks execution, tasks recognition, recognition of bases, employee regenerative breaks associated with the ongoing operation of machine, idle phases of working day and operational phase - performing activities directly related to the timber harvesting. Some of them, such as transfers or idle phases are closely linked to the operation planning, including order of carrying out the tasks, distances between them, or duration of the working shift. The mathematical model allow to perform a number of simulation calculations and consequently the planning of wood harvesting to minimize the duration of the non-productive periods of the day and as a result reduce the unit costs.