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The possibilities of woody biomass harvesting for bioenergy in Turkey

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Abstract: In this study, it was aimed to introduce (i) perceptions and expectations of stakeholders, especially forest villagers, about the procurement and utilization of logging residues, (ii) biomass potential of logging residues which can be utilized as a resource of raw material for production of bioenergy, (iii) the ways to sustainable procurement of logging residues, (iv) the cost of procurement of logging residues, (v) the effect of utilization of logging residues on forest ecosystems in respect to nutrient reserves. The documentation analysis, field surveys and interviews were conducted to determinate the expectations of stakeholders. In order to determine the biomass potential of Brutian pine (*Pinus brutia* Ten.) forests, biomass measurements and calculations were conducted after taking sample plots from stands of different stages within the areas of Isparta Regional Directorate of Forestry. Trails were carried out about the handling, collection, removal, transportation and chipping of logging residues during the production, and costs were calculated with time and motion studies through a model system design. Results showed that available biomass potential of logging residue in Brutian pine forests were 6-14 green tons per ha; logging residues could be removed from the stands, provided that materials with high nutrient contents, such as needles, twigs and barks, were left on site; the available biomass is just about 4% of the total biomass in mature stands; forest villagers will support this action if the fuel wood demands were met and new employment opportunities were created. Besides, it was put forwards that it is possible to acquire logging residues with the traditional labor intensive methods and chipping is a key factor for reduction of production costs.

Keywords: Forest biomass, Logging residues, Harvesting residues, Bioenergy, Chipping, Procurement, Systems analysis, Cost analysis, Nutrient budget