

ANALYSIS OF MINI COMBINE HARVESTER NEEDS AS A POWER SOURCE OF MECHANIZED PADDY HARVESTING IN SEMARANG REGENCY

ABSTRACT

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Mechanical harvesting units are required when the manual harvest workers are not able to cover the harvest area within a harvest time. The field of paddy harvested in Semarang Regency tends to increase by 25% in the last 5 years which cause the harvest season to be predicted to increase from 1,81 times a year in 2018 to 2,19 times per year in 2024. Semarang Regency which has a total paddy harvest area of 42.954,73 hectares with a population of 61.116 rice farmers and 34 units of mini combine harvester. The problems such as technical performance and mechanical harvesting cost in Semarang Regency became the main topics to find the required number, predictions, and recommendations of mechanical paddy harvester.

The efficiency of the mini combine harvester in this region is 61,65% and an average of coverage area is 19,35 hectares/year. On the rainfed field that is rather dry and has less than 10 cm of foot sinkage, the unit can work on 1 hectare of field in 5,6 to 6 hours. When the unit is operated in a wetland area with more than 20 cm of foot sinkage, it requires 10 hours per hectare. The unit will be efficient if working on area which has a foot sinkage depth of 5-10 cm. In term of economics, the average cost of manual paddy harvest in Semarang Regency is Rp3.995.965 per hectare, it more expensive than mechanical harvesting of Rp2.870.499 (ideal cost) or Rp1.392.900 (rental cost). To meet the total needs of harvester units in the appropriate areas, reallocation units in several areas is required such as Banyubiru District (the majority of foot sinkage above 30 cm) and Pringapus District (the manual harvest workers have covered their harvest area). In 2024, it is predicted that 43 units (based on district area needs) or 39 units (based on regency area needs) are required to fullfil the needs.

Keywords: paddy, mini combine harvester, power source, coverage area, fulfillment.