

## PERANCANGAN TROLI UNTUK PENURUNAN RISIKO ERGONOMI PADA AKTIVITAS ANGKUT DI LAHAN SAWAH DAN JALAN DESA

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### INTISARI

Aktivitas angkat angkut secara manual masih sangat dominan dilakukan di persawahan. Lokasi yang jauh dari jalan, beban angkut yang tinggi dan postur yang kurang baik menyebabkan petani pengangkut mengalami risiko ergonomi, salah satunya adalah cedera otot dan rangka yang disebut *Musculoskeletal disorders* (MSDs). Tujuan penelitian ini adalah memperoleh rancangan troli yang dapat mengurangi risiko ergonomi pada aktivitas pengangkutan di lahan sawah.

Penelitian tentang penurunan risiko ergonomi pada pemanen ini dilakukan dengan mengganti aktivitas angkat angkut secara manual dengan alat bantu mekanis berupa troli. Perbaikan postur kerja dan pengurangan rasa sakit akibat pengangkutan beban angkat dan angkut menjadi parameter utama perancangan troli. Perubahan skor postur kerja pengangkutan cara manual dan menggunakan troli dinilai menggunakan Metode *Ovako Working Posture Analysis System* (OWAS), perbedaan rasa sakit otot dan rangka pada petani dinilai sendiri oleh petani dengan bantuan kuesioner *Nordic Body Map* (NBM), serta penurunan beban kerja fisik diukur dengan metode *Cardiovascular load* (CVL).

Perancangan troli dilakukan dengan melakukan modifikasi dan penambahan fungsi pada Angkong, yaitu troli beroda satu yang sudah sangat umum dipakai di medan berat. Berdasarkan uji coba troli yang dirancang dapat dioperasikan di lahan sawah bekas panen dan di jalan desa untuk membawa beban dengan cara ditarik menggunakan kendaraan roda dua. Analisis postur kerja menunjukkan bahwa aktivitas pengangkutan menggunakan troli ini dapat menurunkan skor postur kerja dari 4 menjadi 1 (OWAS), yang artinya postur kerjanya menjadi lebih baik dan tidak berisiko MSDs lagi. Hasil kuesioner menunjukkan sebelum menggunakan troli skor NBM pada petani rata-rata 72 sedangkan setelah menggunakan troli skor rata-rata NBM 47 yang artinya penggunaan troli dapat mengurangi keluhan kesakitan akibat kerja yang sebelumnya dirasakan oleh petani. Selain itu, hasil pengukuran beban kerja fisik dengan metode CVL menunjukan penurunan rata-rata nilai %CVL dari 33,15% menjadi 27,75%, yang berarti terjadi penurunan beban kerja.

Kata kunci: MSDs, OWAS, postur kerja.

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## **TROLLEY DESIGN FOR ERGONOMIC RISK REDUCTION IN LIFTING ACTIVITIES ON HARVESTED RICE FIELD AND VILLAGE ROADS**

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### **ABSTRACT**

Manual Material Handling (MMH) is an activity that is always present in production activities. In the process of rice cultivation, manual lifting and transport activities are still very dominant in the rice fields. Locations that are far from the road, high loading loads and inappropriate postures put transport workers at risk for muscle and skeletal injuries, known as Musculoskeletal disorders (MSDs). The purpose of this study was to obtain a trolley design that can reduce ergonomic risks in lifting and transport activities in paddy fields.

Research on reducing ergonomic risk in harvesters is carried out by replacing manual lifting and transport activities with mechanical aids in the form of trolleys. Improvement of work posture and reduction of pain due to lifting and carrying loads are the main parameters of trolley design. Changes in work posture scores for transporting manually and using trolleys were assessed using the Ovako Working Posture Analysis System (OWAS), the difference in muscle and skeletal pain in workers was assessed by workers themselves with the help of a Nordic Body Map (NBM) questionnaire. ), and the decrease in physical workload was measured by the Cardiovascular load (CVL) method.

The design of the trolley is done by modifying and adding functions to the Angkong, which is a one-wheeled trolley that is very commonly used in heavy fields. Based on trials, the designed trolley can be operated on ex-harvested rice fields and on village roads to carry loads by pulling using two-wheeled vehicles. Work posture analysis shows that the activity of transporting using this trolley can reduce the work posture score from 4 to 1 (OWAS), which means that the work posture becomes better and there is no risk of MSDs again. The results of the questionnaire show that before using the trolley the average NBM score for workers is 72 while after using the trolley the average NBM score is 47, which means that the use of the trolley can reduce complaints of pain due to work previously felt by farmers. In addition, the results of measuring the physical workload with the CVL method showed a decrease in the average %CVL value from 33.15% to 27.75%, which means a decrease in workload.

Keywords: MSDs, OWAS, work posture.

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