

ABSTRACT

Heavy equipment such as excavators plays a crucial role in supporting the palm oil replanting process. To ensure their reliability, the Total Productive Maintenance (TPM) method and Overall Equipment Effectiveness (OEE) measurement were applied to a Kobelco SK130 excavator at PT Bumi Terang Fortuna. Equipment effectiveness was evaluated using three components: availability, performance, and quality. This approach enabled the identification of downtime and performance decline, providing the basis for developing a more structured and efficient maintenance program to improve replanting productivity.

A total of 34 excavator units were analyzed across four types of work: chipping, stacking, compacting, and trenching. OEE values were calculated, followed by the identification of the Six Big Losses as the root causes of low effectiveness. These causes were further examined using a fishbone diagram and prioritized with the Urgency, Seriousness, Growth (USG) method, allowing the main root causes to be measured and ranked according to handling priority.

The average Overall Equipment Effectiveness (OEE) value was found to be above 80%, except for compacting operations, which showed a significant decline. The decrease was attributed to setup and adjustment losses as well as reduced speed losses. The main contributing factors included monitor code errors and low hydraulic power (USG 12), along with high workload, low operator motivation, soft ground conditions, and hot and dusty weather (USG 11). In response, a Google-based dashboard system was developed to enable real-time OEE monitoring, supporting both effective troubleshooting and decision-making processes

Keywords: *Total Productive Maintenance, Overall Equipment Effectiveness, Productivity, Replanting*

INTISARI

Alat berat seperti *excavator* memiliki peran penting dalam mendukung proses *replanting* kelapa sawit. Untuk menjaga keandalannya, diterapkan metode *Total Productive Maintenance* (TPM) dan pengukuran *Overall Equipment Effectiveness* (OEE) pada Excavator Kobelco SK130 di PT Bumi Terang Fortuna. Efektivitas alat dianalisis melalui tiga komponen utama, yaitu *availability*, *performance*, dan *quality*. Pendekatan ini memungkinkan identifikasi penyebab *downtime* dan penurunan kinerja, sehingga program perawatan yang lebih terstruktur dan efisien dapat disusun guna mendukung peningkatan produktivitas *replanting*.

Sebanyak 34 unit excavator dianalisis pada empat jenis pekerjaan, yaitu *chipping*, *stacking*, *compacting*, dan gali parit. Nilai *Overall Equipment Effectiveness* (OEE) dihitung dan kemudian diidentifikasi *Six Big Losses* sebagai penyebab utama rendahnya efektivitas. Penyebab tersebut dianalisis menggunakan *fishbone diagram* dan diprioritaskan melalui metode *Urgency, Seriousness, Growth* (USG), sehingga akar masalah utama dapat diukur dan diprioritaskan penanganannya.

Rata-rata nilai *Overall Equipment Effectiveness* (OEE) ditemukan di atas 80%, kecuali pada pekerjaan *compacting* yang menunjukkan penurunan signifikan. Penurunan ini disebabkan oleh *setup and adjustment losses* serta *reduced speed losses*. Penyebab utama meliputi *code error* pada monitor dan rendahnya daya hidrolik (nilai USG 12), serta beban kerja tinggi, rendahnya motivasi operator, kondisi tanah lembek, dan cuaca panas dan berdebu (nilai USG 11). Untuk menanggapi hal ini, telah dikembangkan sistem dashboard berbasis Google yang memungkinkan pemantauan OEE secara real-time guna mendukung efektivitas perbaikan dan pengambilan keputusan yang lebih cepat.

Kata Kunci : *Total Productive Maintenance, Overall Equipment Effectiveness, Produktivitas, Replanting*