



Shortening harvest interval, reaping benefits?

A study on harvest practices in oil palm smallholder farming systems in Indonesia.

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Background

Smallholders are key to sustainable palm oil production, but their yields remain low. Better management practices, including **proper harvest interval (HI)**, can raise yields and strengthen rural economies without further cropland expansion. However, **agronomic and socio-economic drivers underlying harvest decisions are poorly understood.**

Objective

We explored **agronomic, socio-economic, and institutional** factors that underly harvesting practices in independent oil palm smallholder farming systems in Indonesia to assess **scope for sustainable intensification** through **shorter HI** and **reduced harvest losses.**

Methods

- **Farmer diaries** to follow harvest practices to establish a correlation of HI with yield on **950 fields** in **six locations** in Indonesia (Riau, Jambi, South Sumatra, West Kalimantan, Central Kalimantan, East Kalimantan). Period: **Jan 2020 –Jul 2022.**
- **Post-harvest field audits** to quantify harvest loss (loose fruits and missed bunches) in RI, WK (BMP¹ n= 12; NFT² n=27).
- **Qualitative interviews** in RI, WK (BMP n= 12; NFT n= 30);
- **Survey** (n= 1132) to understand farmers' decision-making on harvesting.



Fig 1. Research sites: 1. RI; 2. JB; 3. SS; 4. WK; 5. CK; 6; EK.

¹ Farmers with field trials adopting Best Management Practices (BMP).
² Non-field trial (NFT) farmers continued management as usual.

Results

1) Harvest losses in farmer fields

- We could not analyse data on loose fruits because these were often **collected directly after harvest** by the farmer, or others as source of income. Therefore, we focussed on **missed bunches.**
- For a given HI, there is **variation in harvest losses.**
- While the **potential yield loss** increases with HI, the **actual harvest loss** will depend on the quality of the harvest as determined by the socio-economic factors, such as loose fruit economy, land size, FFB price, labor availability.

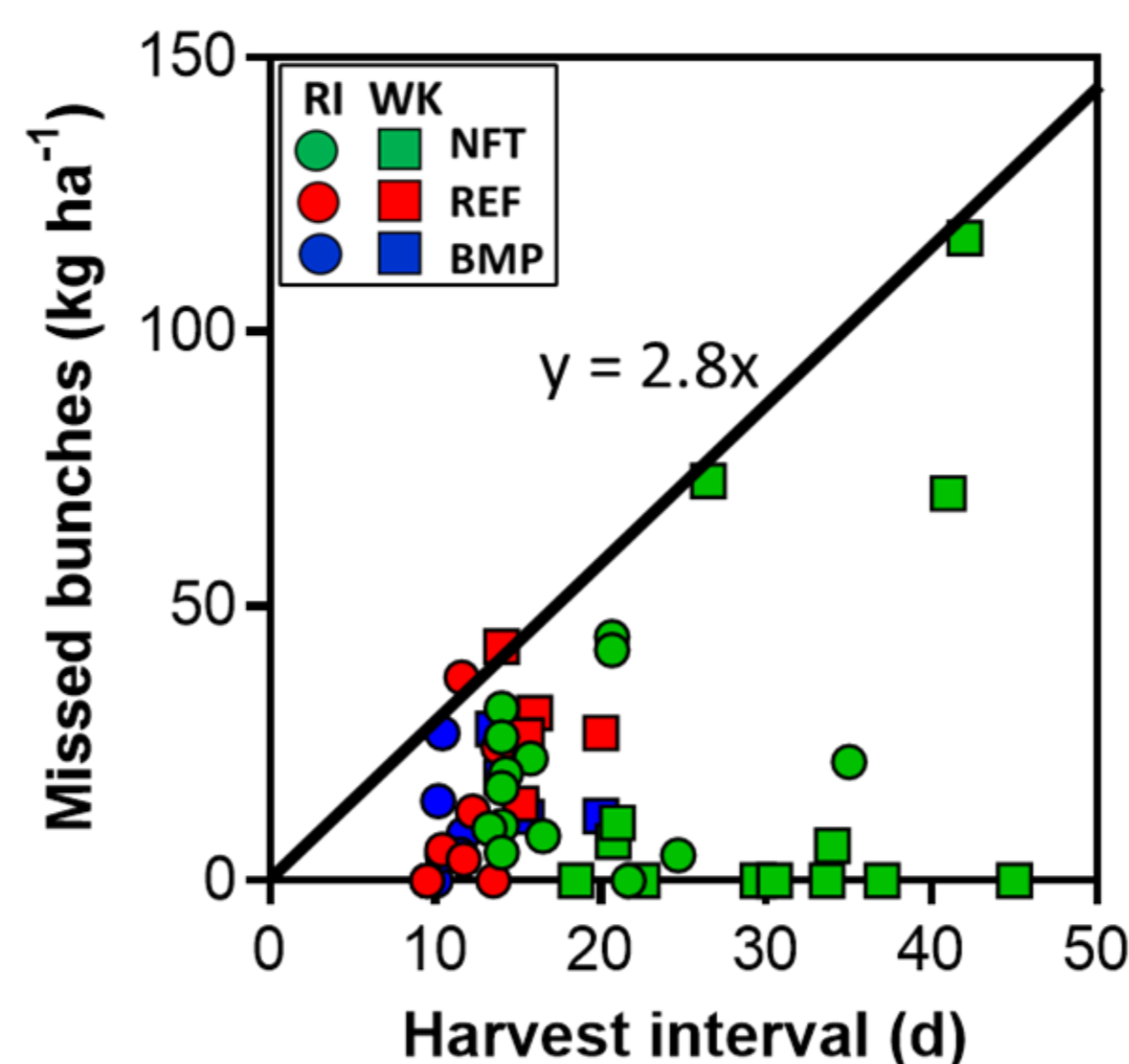


Fig. 2 Relationship between missed bunches and harvest interval across fields under three treatments in Riau (RI, circles) and West Kalimantan (WK, squares): field trials adopting best management practices (BMP, blue), field trials not adopting BMP (REF, red), and non-field trials (NFT, green). Each symbol corresponds to the average for a given field per harvest round.

2) Socio-economic drivers of harvest decisions

- Smallholders in this study had an **overall mean HI of 17 days.** One third maintained HI longer than 22 days.
- **Long HI** significantly correlated with **low FFB yield** ($p < 0.05$ in all sites, except SS), **small land size** ($p < 0.05$ RI, JB, WK, EK), and **low FFB price** ($p < 0.05$ all sites).

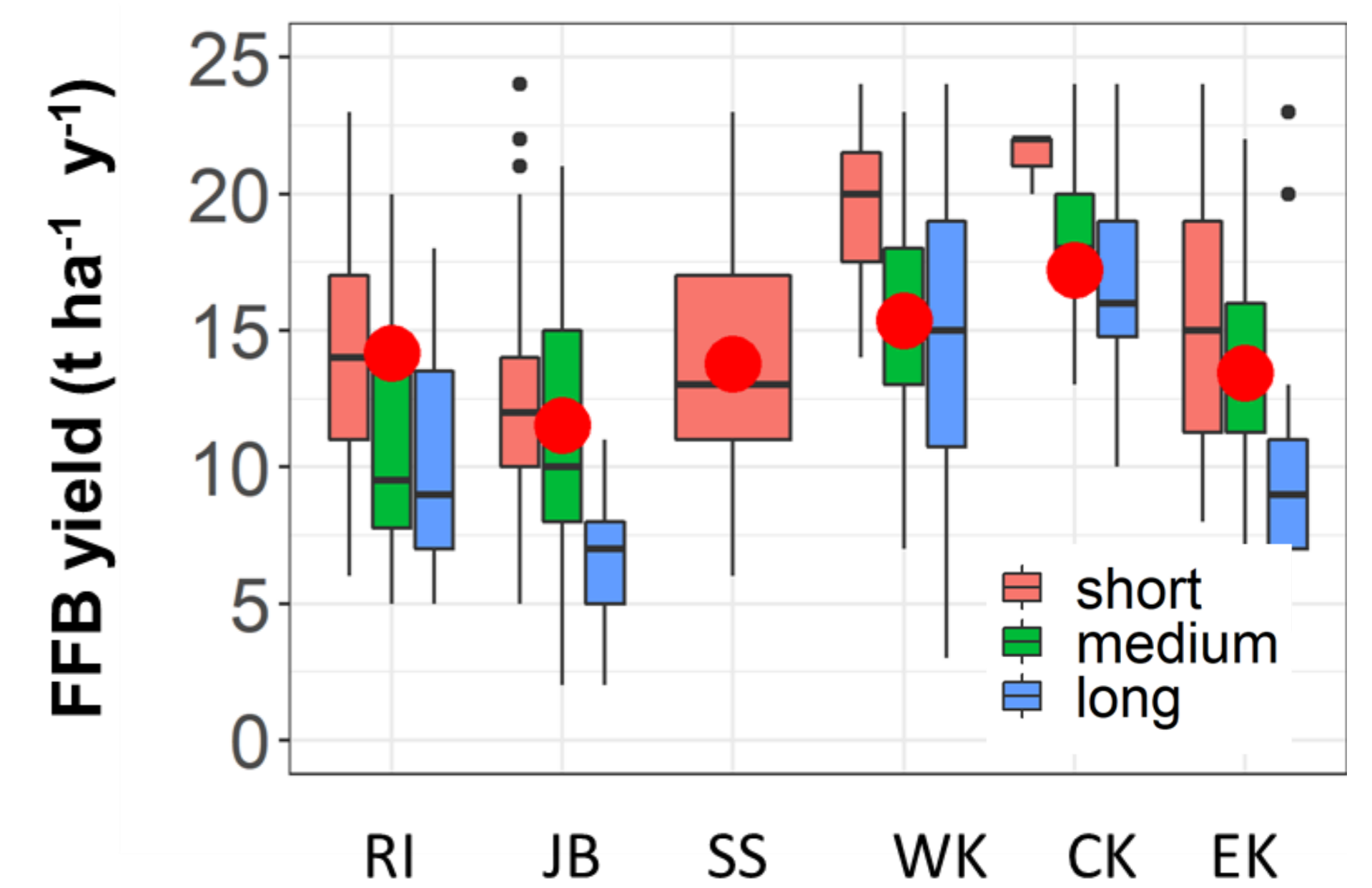


Fig 3. Boxplot showing distribution of mean FFB yield per three categories of harvest interval (short <16; medium 16–22; long > 22 days), across six sites in Indonesia based on data collected from 950 smallholder fields.

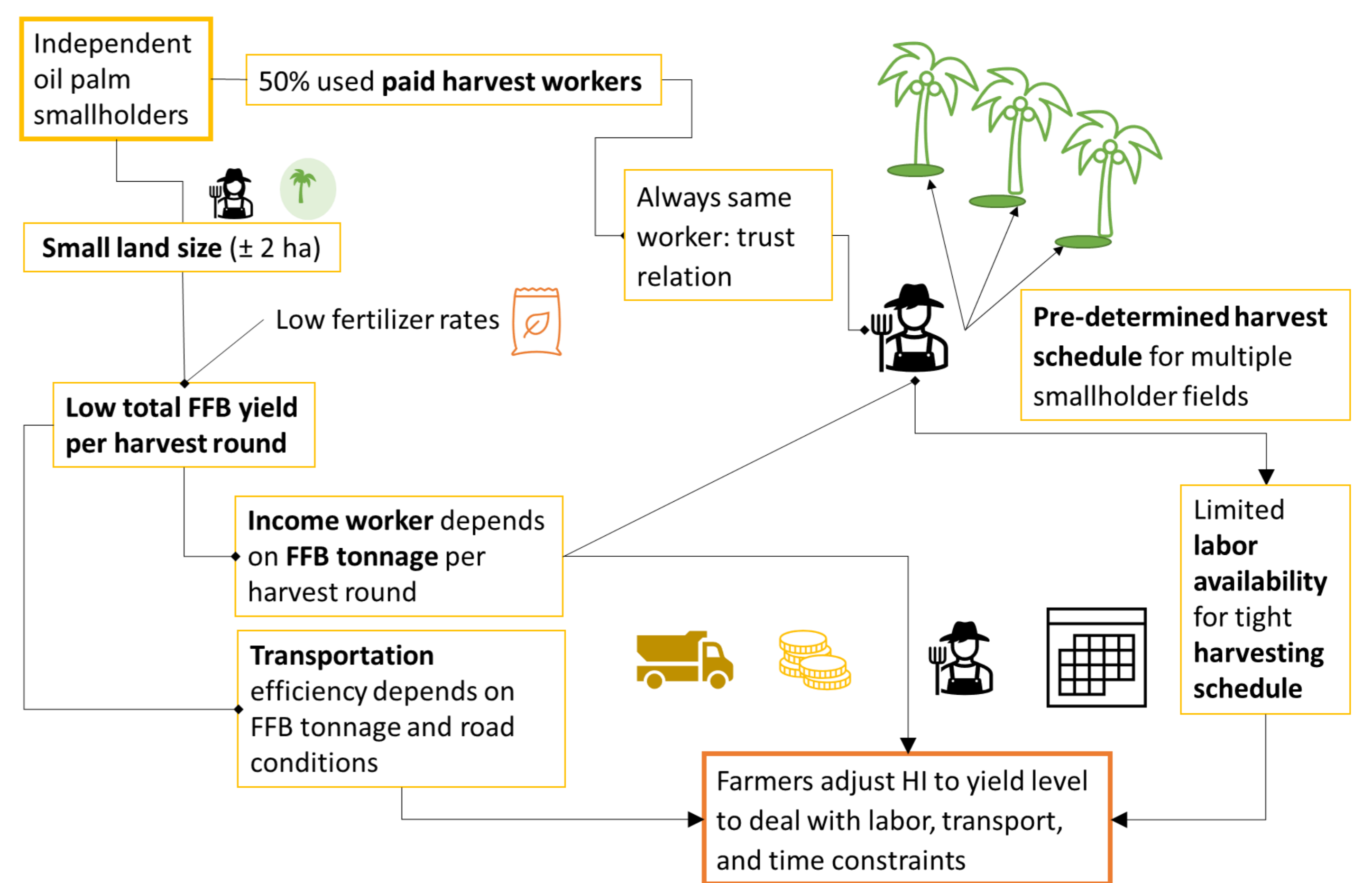


Fig 4. Farmers extended HI in low-yield conditions to increase labor productivity, raise income of hired workers, and reduce relative transportation costs.

Conclusions

- Independent oil palm smallholders in our study have **longer HIs** than those **recommended** to minimize harvest losses.
- Potential **harvest losses increase** with longer HI, but farmers **adjust HI to yield level** to make it compatible with **time, transport, and labor constraints.**
- Reducing HI requires **collective action along the supply chain** to streamline the harvest and sale process.
- More research based on both **agronomy** as well as **anthropology** research approaches can contribute to a **better understanding of farmers' realities**, enabling context specific and realistic support programs for farmers.

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