

# SMP-19072. Diversification in oil palm production landscape for food and livelihoods

Den Haag December 12, 2019

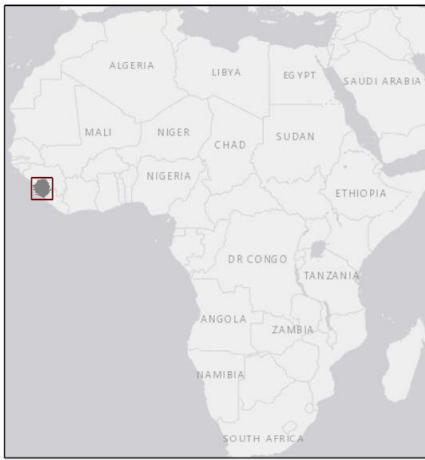


# Partners objectives and questions

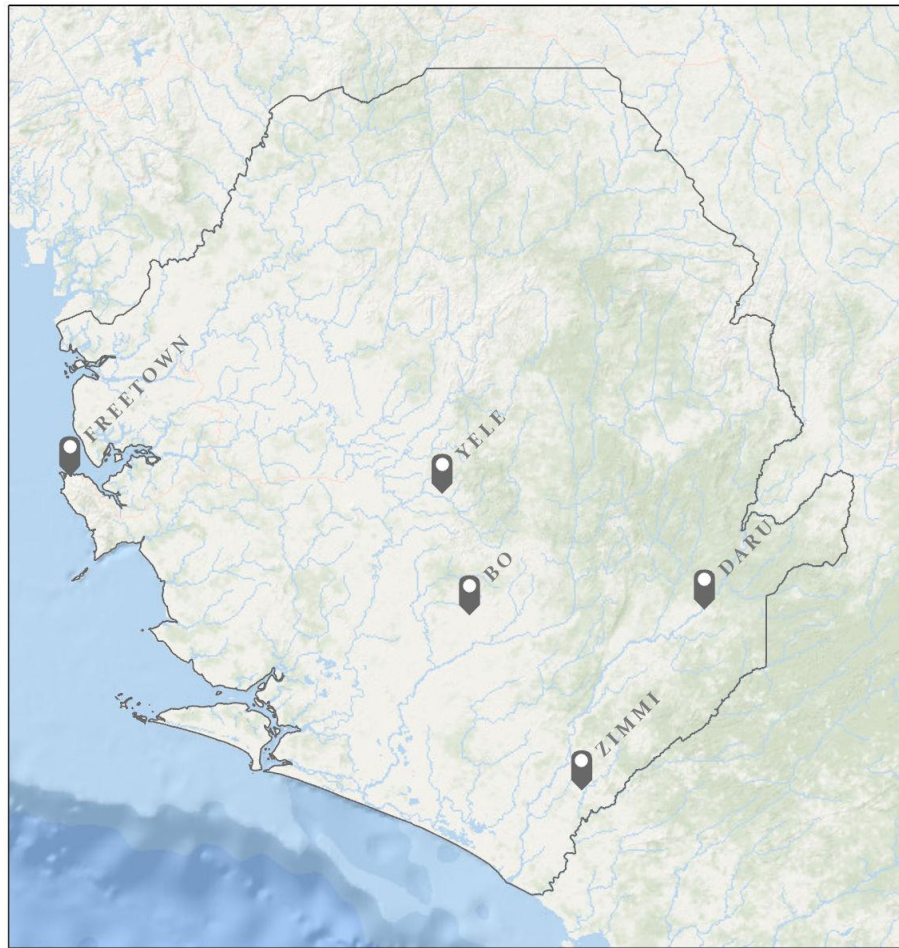
- Define best options for integrating smallholders into ecological oil palm system. To optimize oil palm business and local needs (income, agri-biodiversity, land sharing/sparing, residues use, food security, healthy diets).
- **Solidaridad**: Explore suitable intercropping models to enhance farmer income, food security and agricultural knowledge.
- **Natural Habitats/Goldtree**: Optimize nutrient cycles in oil palm, business model for improved biomass use.
- **East-West Seeds**: Explore local need for improved vegetable seeds

Potential extra partner

- **Tradin** (Peter Pijpers): Opportunities for improved ecological cacao production – Interest in intercropping & marketing organic crops



- West Africa
- Tropical climate
- Origin of oil palm
- Improved Agribusiness Investment Approval process
- Slash & burn → secondary forest
- Organic by default → organic sourcing a logical option



# Sierra Leone(2)

- Still recuperating from civil war and Ebola→ low road, market, knowledge infrastructure
- Dependent on mining
- Nett food importer
- Subsistence farming



# Global oil palm business as benchmark



Oil palm plantation near mill  
Processing within 24hr to avoid FFA  
Harvest at 2 week intervals  
Logistics



# Modern oil palm system



**10% Oil**  
**90% Biomass**



Palm fronds



Fresh fruit bunch



Palm trunk



CPO and CPKO



Palm shell



Mesocarp fibers



Empty fruit bunches



POME

**Biggest commodity oil worldwide**



**Residues**

Ref: MPOB

# Sierra Leone traditional palm oil system

- Oil palm is traditional crop processed by farmers → red oil for cooking & sales
- Kernel and fibers used as fuel
- How to integrate local farmers into modern oil palm mill system?



# Integrating smallholders in oil palm business

## ■ Challenges:

- Mix of varieties and wild oil palm → low processing yields
- Long time before processing → Free Fatty Acids
- How to convince farmers to take care of new oil palms?
- Ecological farming must manage nutrients N, P and K
- How to commit smallholders to a mill?
- Very expensive logistics: bad roads, rivers to cross & low volumes/hectare/harvest



# Observations and suggestions

- Smallholders can hardly deliver quality → Education and stimulation, logistics
- Own plantation may be able to produce quality
- Switch to biogas energy:  
Lower GHG and other emissions, better nutrient recycling, lower cost boiler.  
→ sell GHG credits?
- Kernel processing is an opportunity for expensive oil and proteins (PKO+PKM)
  - If quality can be sourced!



# Suggestion for intercropping

- To avoid newly planted oil palm trees to be overgrown by weeds → intercrop to occupy the soil
- When palm tree is too young to provide fruits → intercrop for food or income (ginger, pineapple)
- For nutrient supply to oil palm plus food → add legume (groundnut, beans) to fix N from the air



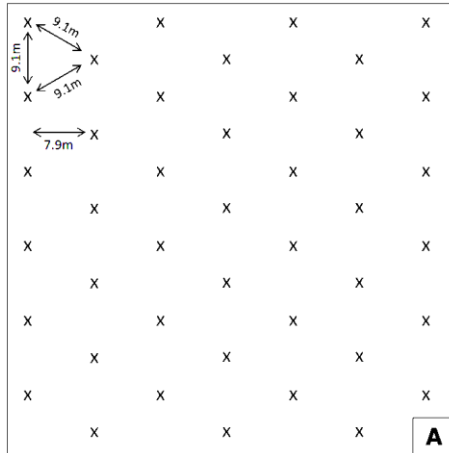
## Suggestions

1. Intercropping with legumes → N
2. Optimal recycling of P and K (EFB/ field)
3. Biogas → digestate → P and K for fields
4. Cattle grazing and manure to field

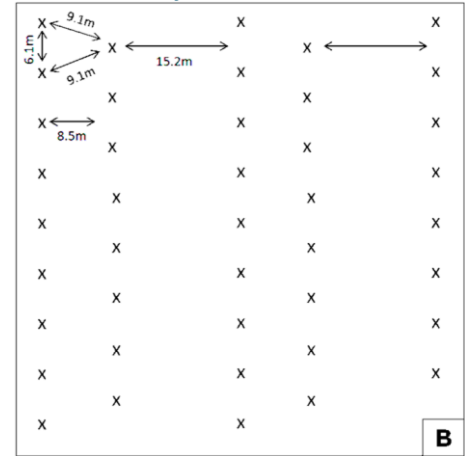


# Temporary or permanent intercropping?

Conventional  
Triangular System



Double-Row Avenue  
System



Canopy closed after a few years  
 ⇒ Intercropping max 5 years  
 ⇒ vegetables, pineapple, beans,  
 groundnut, ginger,...

Openings allowing light  
 ⇒ Intercropping for 25 years  
 ⇒ Rotation in avenues with N-  
 fixing crops (green manure)  
 to improve soil fertility<sup>11</sup>



# Vegetable observations and opportunities

- Locally produced crops & imported (Dutch) onions



Pepper, eggplant



Okra

## Suggestions:

- Vegetables can be produced as oil palm intercrop (5yrs)
- Replacement of imports
- Rice-based diets → produce veg. for better diets & income
- Improved seeds needed
- Target women as producers



Leaves of cassava & sweet potato



Tomatoes



Rice

# Follow-up

- (1) Experiments with intercropping in oil palm is attractive for the business partners both on their plantation and with farmers they source from. They are willing to collaborate with seed companies, farmers, NGOs and researchers to make this happen.
- (2) Biogas is an interesting option to improve nutrient management and to limit GHG and other emissions. The energy may be beneficial for company and farmers. Company and researchers willing to make a tailored business case and with that search for attractive investment possibilities (e.g. carbon credit systems?)
- Where to find funding for collaboration?
  - Set-up an Ecological oil palm research project?(1)
  - Biogas for mill and for farmers?(2)
  - EU H2020 proposal (in development)
  - SDG proposal?

# END

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