
Jatropha curcas Oil Production for Local Development

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Time to up-scale?

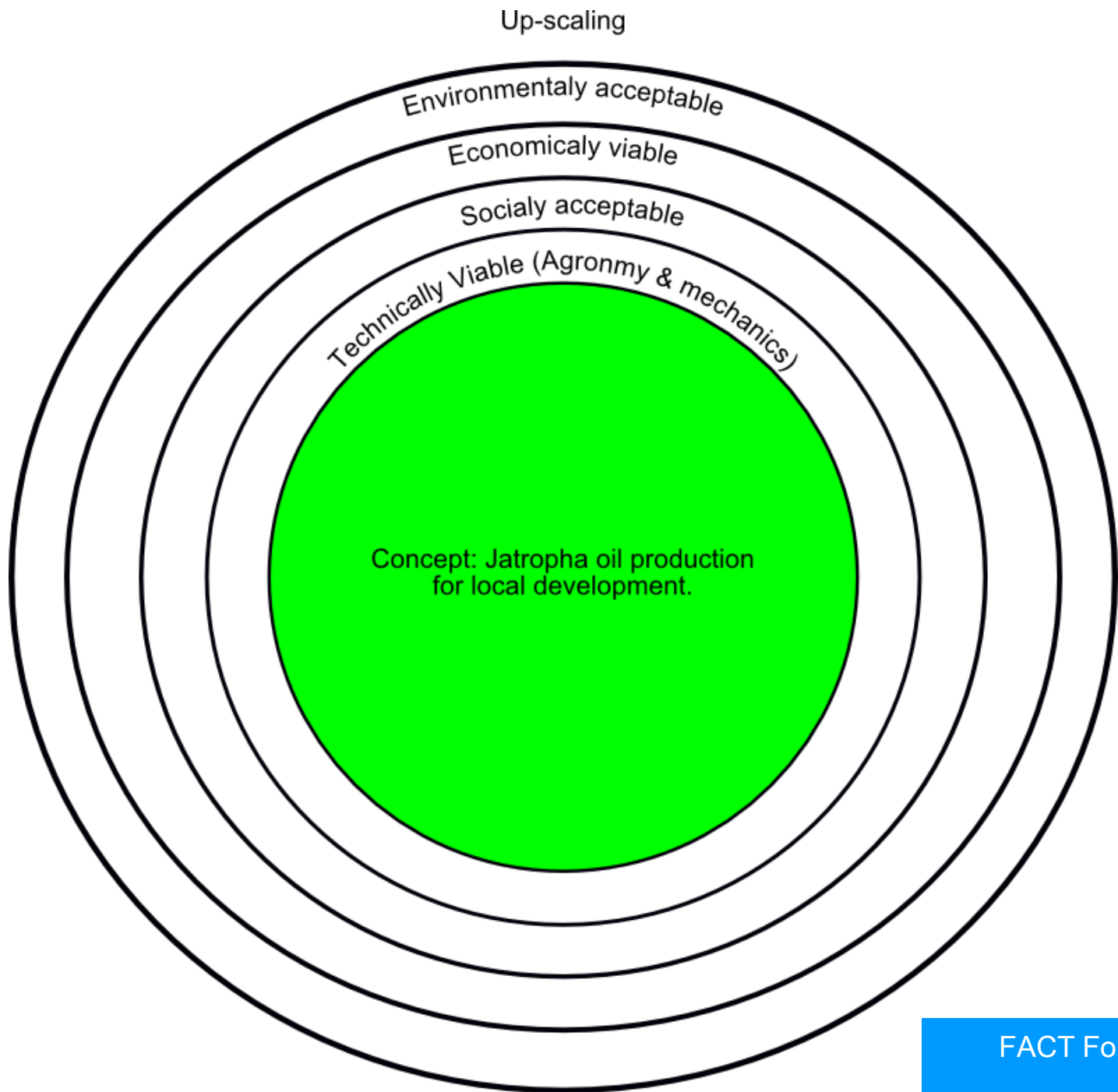
Flemming Nielsen

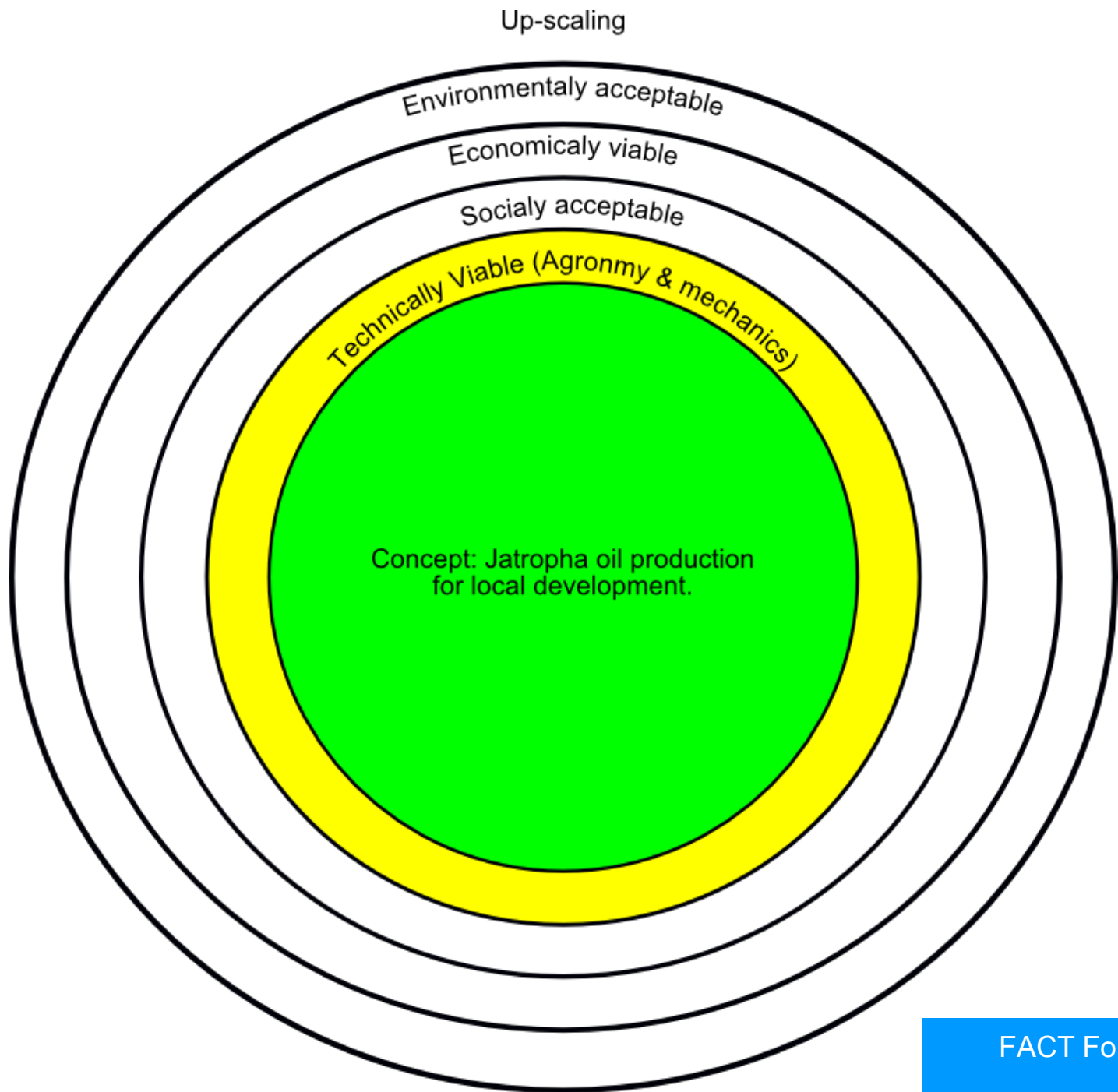


*FACT Foundation & **Banana hill***

Aim

- *Develop the whole chain from production to consumption*
- *Assess if it is a viable model for local development*





Up-scaling

Environmentally acceptable

Economically viable

Socially acceptable

Technically Viable (Agronomy & mechanics)

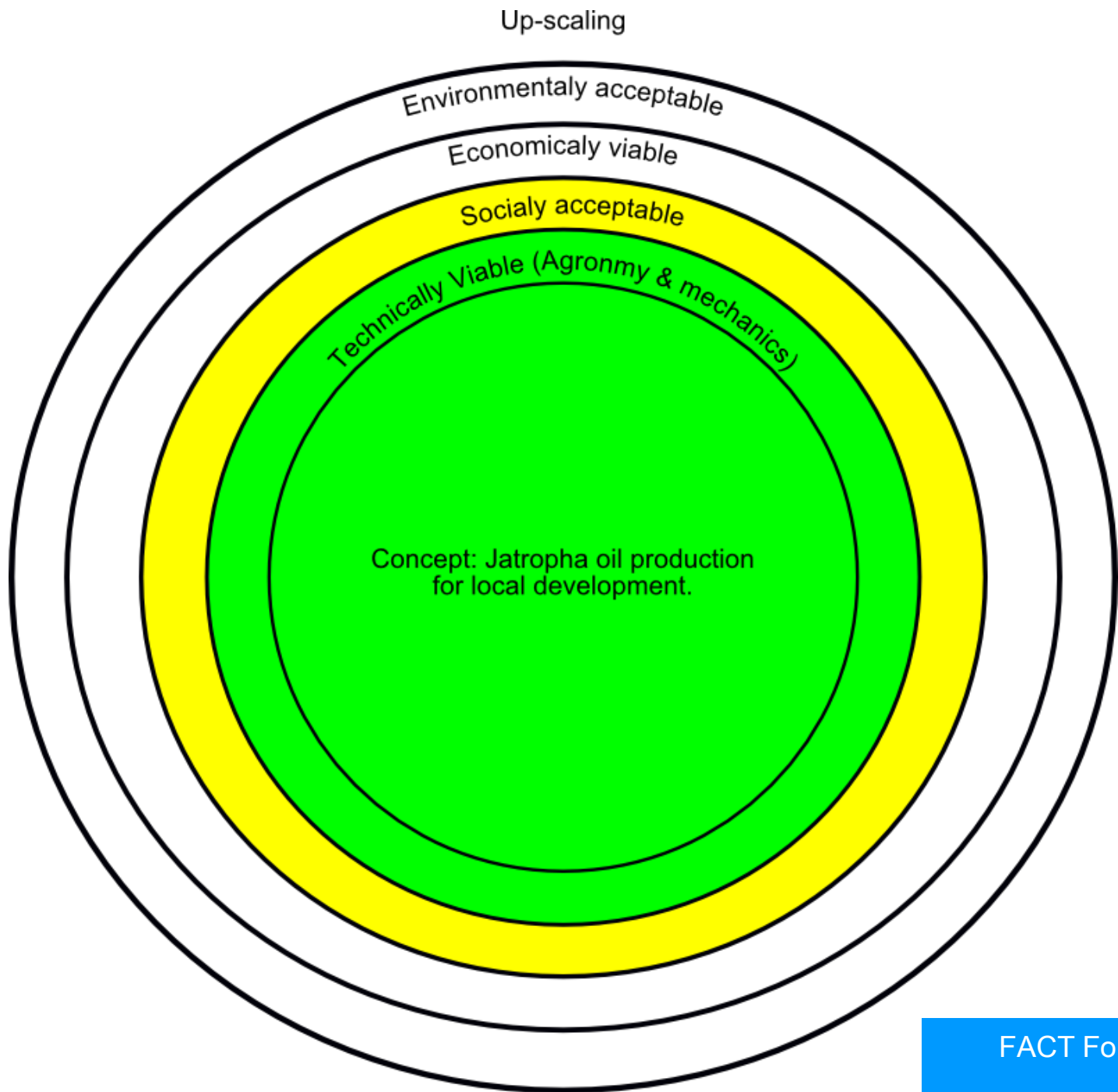
Concept: Jatropha oil production for local development.

Agronomic Issues

- *System works but is not optimized*
- *Yields uncertain*
- *Knowledge lacking about:*
 - *best provenances*
 - *planting distance*
 - *pruning regime*
 - *risk of spreading diseases to food crops*
 - *IPM*
 - *etc..*

Engineering Issues

- *Looks promising, but*
 - *Limited long-term testing anywhere*
 - *Concern about oil quality*



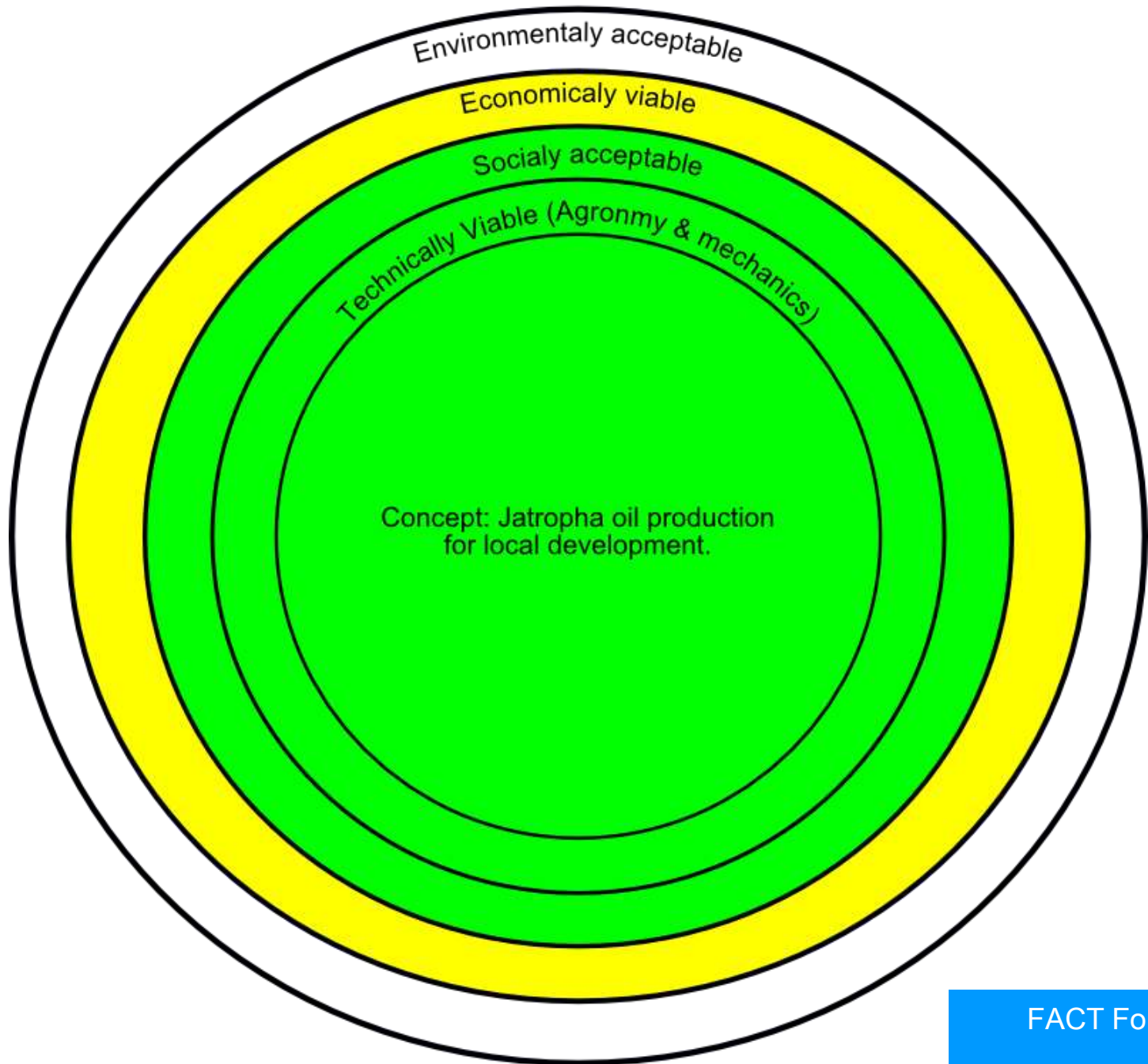
Social Issues

- *Jatropha known in the area*
- *No gender bias*
- *Theft*
- *Labour demand coincide with food crops;*
- *But harvest can be postponed*
- *Jatropha does not substitute food crops*
- *Jatropha cultivation adopted faster than expected*

Social Issues

- *No major social issues yet*
- *Gender & wealth issues may arise when production increases*
- *How do permanent hedges affect a shifting cultivation system?*

Up-scaling



Labour Demand

- *After a few seasons harvest is most labour demanding operation:*
 - *5 kg picked per hour*
 - *1-3 kg clean seeds per hour*
- *Off-season harvest possible*



Farm Gate Price

- *2.5 to 5 MZN/kg considered realistic*
 - *BBC Business plan feasible*
 - *Will farmers sell at this price?*

Calculation 1: Selling Seeds

- *0.1 USD/kg*
- *1-3 kg clean seed per hour*
- *0.8-2.4 USD/day*
- *Day labour: 1.2-1.4 USD/day*

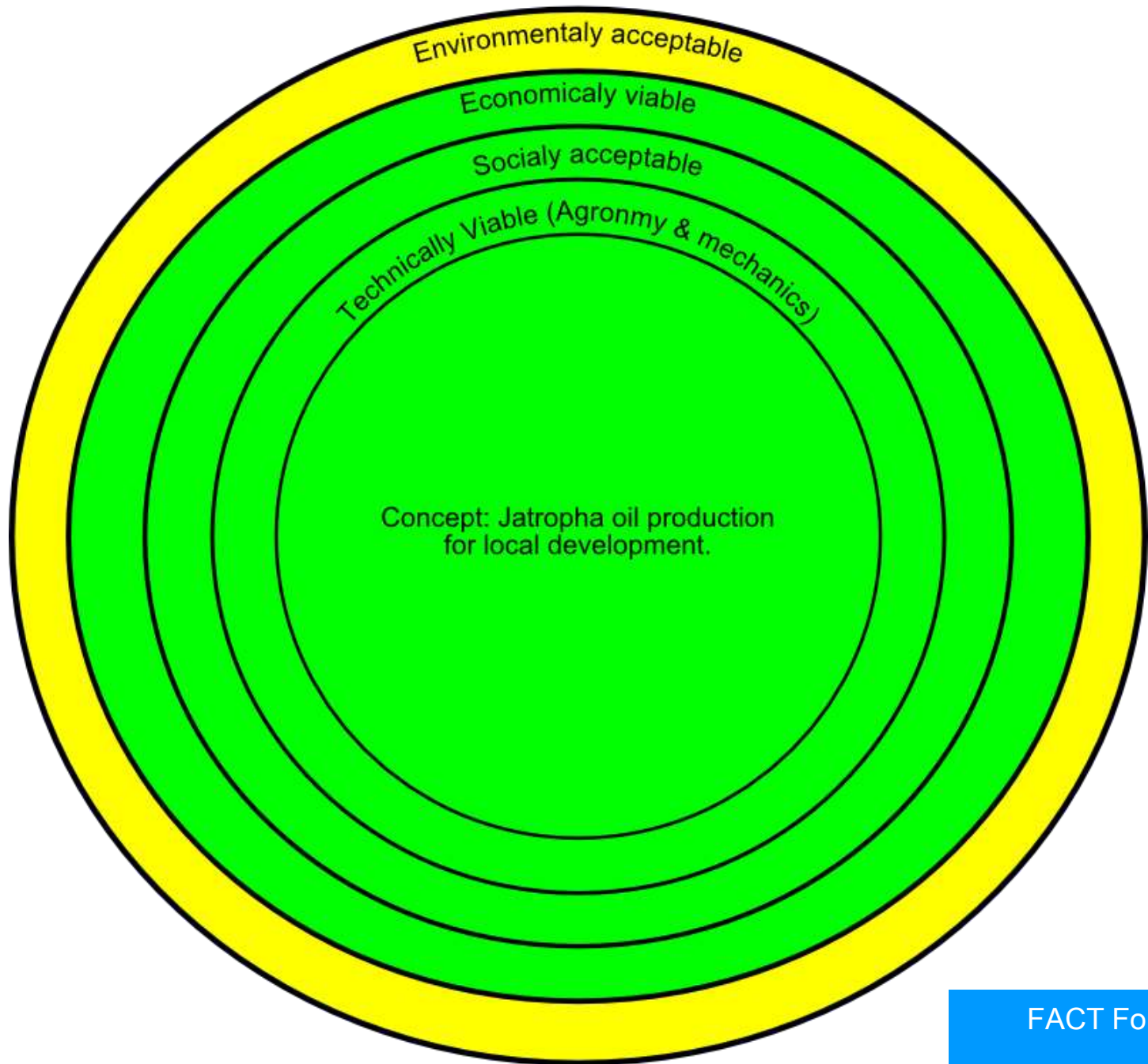
Calculation 2: Own Oil Production

- *1-3 kg clean seed per hour*
- *5.5 kg seed = 1 litre oil*
- *1 litre oil extracted per hour*
- *value of 1 litre Jatropha oil = 1 litre diesel = 1.2-1.4 USD*
- *0.76-1.88 USD/day*
- *Day labour: 1.2-1.4 USD/day*

Economic Issues

- *Expected that Jatropha can compete with alternative income options*
- *Many unknowns*
 - *Firm conclusion not possible yet*

Up-scaling



Cultivated Area

- *Mainly substitution – not expansion*
 - *labour is the main limitation*

CO₂ Balance at Plot Level

- *Maize fields/fallow to Jatropha:*
 - *positive balance*
- *Primary forest to Jatropha:*
 - *1000+ years of Jatropha cultivation to pay back carbon debt.*

CO₂ Balance at Community Level – Two Scenarios

- *Subsistence farming continue as usual:*
 - *Crop substitution/no expansion*
 - *positive CO₂ balance (subst. diesel with Jatropha oil)*
- *Introduction of Jatropha*
 - *> economic development*
 - *> purchase of labour saving inputs*
 - *> expansion of cultivated area*
 - *> increased cutting of primary forest*
 - *> negative CO₂ balance*

Environmental Impact

- *Indication that CO₂ balance depends on development scenario*
- *Other environmental impact not researched*

Time to Up-Scale?

- *Still many unknowns*
- *If up-scaling is done now:*
 - *Understand it is unproven technology*
 - *Be aware of unique factors that contribute to success in the project area*
 - *Don't off-load risk on farmers or diesel owners*

Thank you!

