Water Footprint Assessment of Small Banana Producers in Peru and Ecuador

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The water footprint concept

Water footprint concept: developed by the Water Footprint Network:

- People use lot of water for drinking, cooking, washing; but even more for producing and consuming things. Human impact on freshwater systems: is linked to human consumption.

- Water footprint of a product = the volume of freshwater appropriated to produce the product, that is: the volumes of water consumed and polluted in the different steps of the supply chain; and not available anymore for other purposes.

- Many countries have externalized their water footprint, importing considerable amounts of water-intensive goods (= with a high water footprint) from elsewhere.

- The sustainability of the water footprint of a given product depends on the specific condition of the watershed where this footprint is produced (impact is local).

Water footprint is composed of:

- Green water footprint: consumption of rainwater, stored in the soil.
- Blue water footprint: consumption of water from superficial or subterranean sources.
- Grey water footprint: volume of water needed to assimilate contaminants.
Approach, boundaries and scope of the assessment:

- **Only production and processing** (not the rest of the chain, packing materials, transport ... etc.).

Sample Ecuador:

- 15 producers, each with their own packing station, average area: 10 ha banana.
- Conventional, organic and agroforestry production systems, different agro-ecological zones from dry to semi-humid. **Seasonal irrigation, different systems.**

Sample Peru:

- Samples around 6 packing stations, processing banana of 106 small producers.
- Average area: 0.5 - 1.0 ha banana per producer in organic production systems, in arid zones; year-round dependent on gravity irrigation (see picture).
Water footprint assessment: results

Ecuador, water footprint per month, m³ per ha (see below, left side):
- Variation per month in green and blue water footprint, according to the rainy season.

Peru, water footprint per month, m³ per ha (see below, right side):
- Almost entirely: blue water footprint (mostly irrigation, only 1% = processing).

Aggregate annual water footprint divided by yield / ha = water footprint per TM or box:
- Ecuador and Peru: between 576 - 599 m³ per TM (+/- 11,0 m³ per box of 18,14 kg).
- This means: for 1 container of banana, a virtual export of 160 containers of water!
Conclusions

Ecuador:
- Sprinkler irrigation, but very inefficient. Waste of water, fuel, energy.
- Contamination risks of rivers (mining activities upstream).

Peru:
- Gravity irrigation, in monthly quota. Whole plot is inundated (as in rice ponds). Suffocation of roots, water evaporation, leaching of nutrients → affect yields, quality and income of poor banana farmers.
- Water scarcity 5 months per year; sedimentation of the Poechos reservoir (Niño events, erosion). Critical situation; water footprint is not sustainable.

Elements for a response strategy in both countries:
- Strategies needed for water resource conservation and reduction of blue and grey water footprint, in a territorial approach and multi-stakeholder negotiation process.
- Introduce precision irrigation (H₂O what the plant really needs); start systematic monitoring of precipitation, evapotranspiration, water use. Communicate, be aware.
References


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