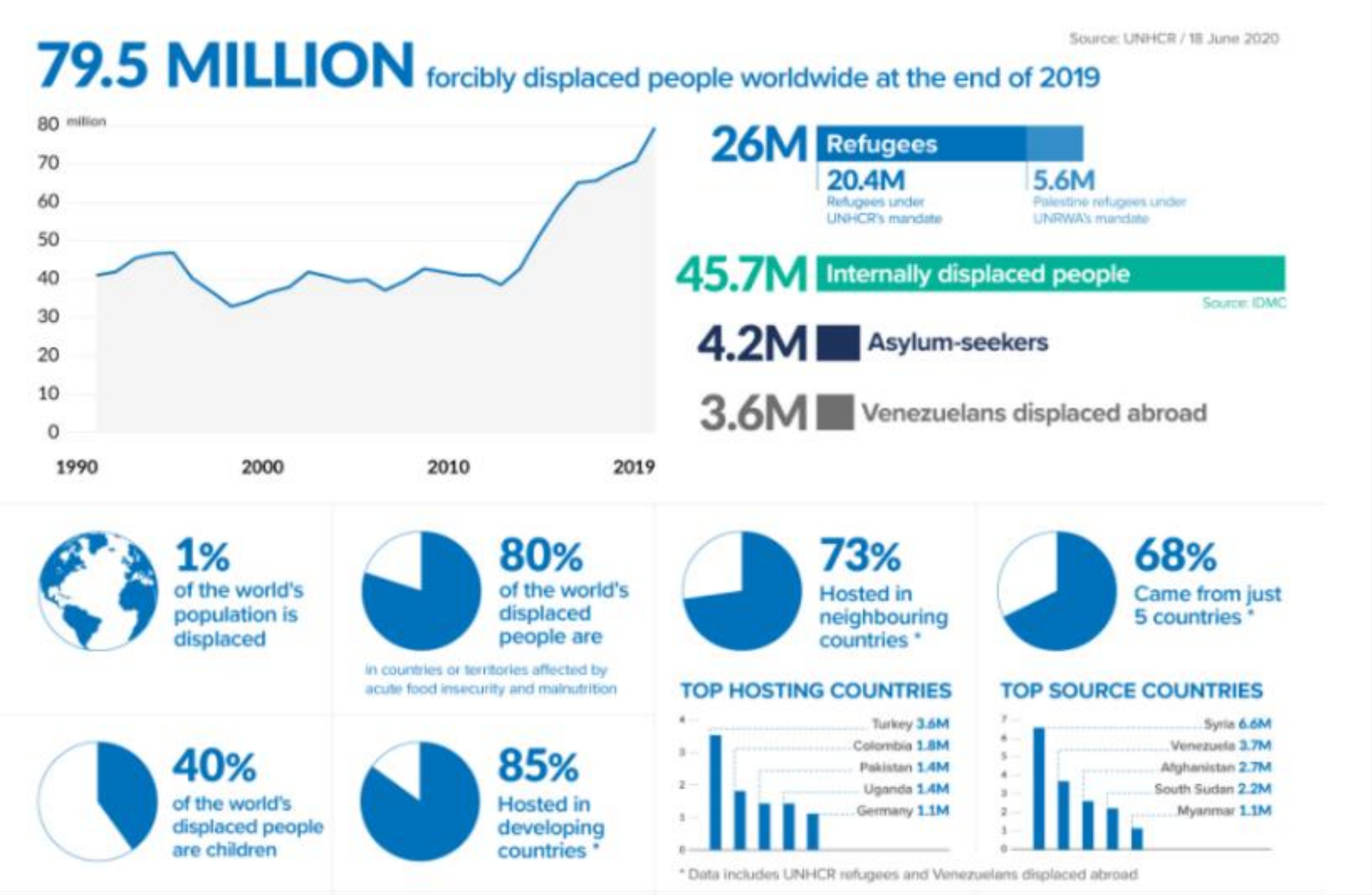
The development and use of vermifilters in humanitarian settings

Dr Claire Furlong, IHE Delft, Netherlands

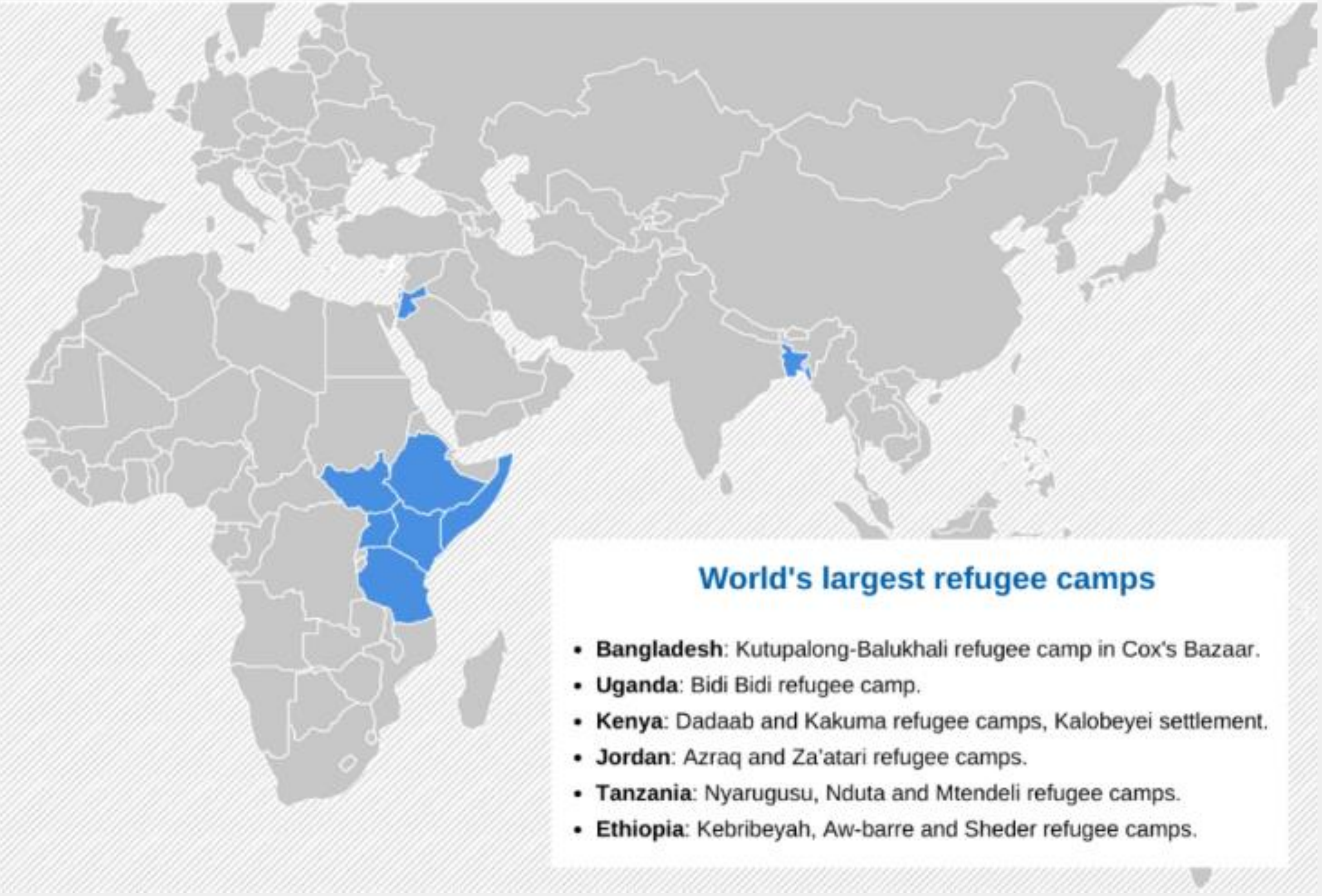
Why humanitarian contexts…



- UNHCR defines a protracted refugee - 25,000 or more refugees exile for at ≥ 5 years
- 15.7 million refugees protracted crisis
- 2.6 million refugees hosted in camps (10%)

Source: https://www.unhcr.org/figures-at-a-glance.html

Why camp settings?



- Cox's Bazaar 1 million refugees
- Average camp life is 24 years
- Stat's do not include IDPs camps
- 140,000 stateless Rohingya in Rakhine living in camps or camp-like conditions

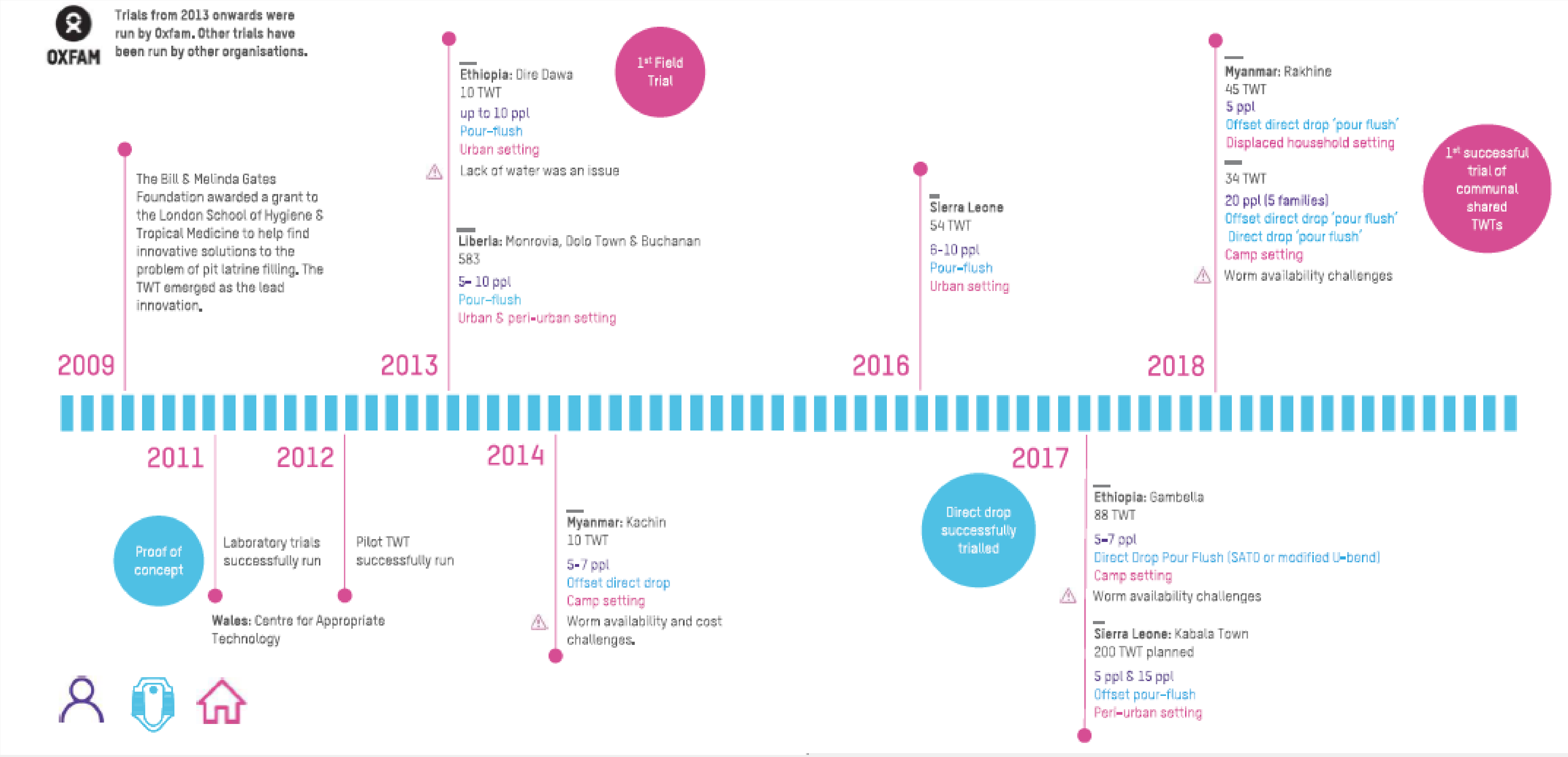
Source: https://www.unrefugees.org/refugee-facts/camps/

Why peri-urban?

- A majority of refugees and IDPs live in urban areas
- Often in peri-urban areas
- No or low quality san
- Initial service provider external agencies e.g. INGOS
- More sustainable options

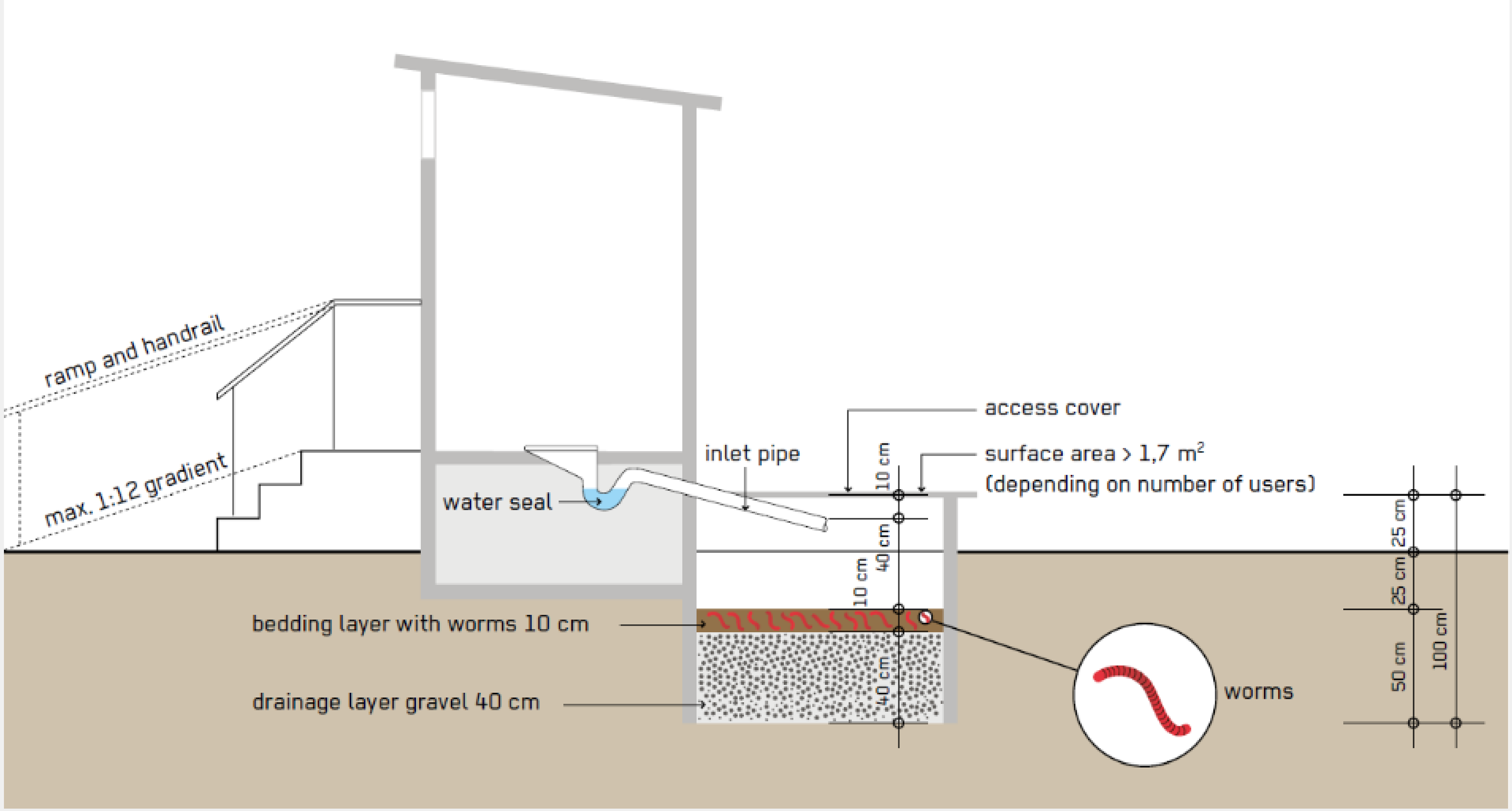
Photo credit: Claire Furlong

Development of TWT…



Source: Tiger Worm Toilet Manual: Global Relevant Learnings from Myanmar

The general concept of the TWT…



Source: Compendium of Sanitation Technologies for Emergencies

Oxfam's TWT research …

Project area	Project years	Toilet type	Pan type	User No.	Surface area	Worm species	Bedding material	Worm density kg/m^2	Main innovation
Dire Dawa	2013-2014	Household with superstructure	Pour-flush	10	1 m^2	Eisenia fetida	Wood shavings	2	Proof of concept
Monrovia & Sierra Leone Trials	2013-2018	Internal toilet with external tank	Pour-flush pedestal	5 -10	1 m^2	Eudrilus eugeniae	Coconut or palm husk	2	Worm species Permeable slab Charcoal layer Sealed tank
Kachin	2013-2015	Household with superstructure	Myanmar style	5-7	0.78 m^2	Eisenia andrei	Woodchip	1.9	Smaller surface area
Gambella	2016-2018	Household with superstructure	Direct drop pour-flush	~5-10	0.70 m^2	Eisenia fetida	Fine woodchip	0.7	Direct drop
Sittwe STMG	***2017-2019***	***Communal with superstructure***	***Direct drop pour-flush***	***~30***	***6 m^2***	***Mixed mainly Perionyx excavatus***	***Coconut fibre***	***0.66***	***Communal design***
Sitwe MRA	2017-2019	Household with superstructure	Myanmar style	5	0.70 m^2	Mixed mainly Perionyx excavatus	Coconut fibre	1.4	Addition of the worms after 1 month

Source: Learning from Oxfam's Tiger Worm Toilets projects

Monrovia, Liberia (2013)

Photo credit: Claire Furlong

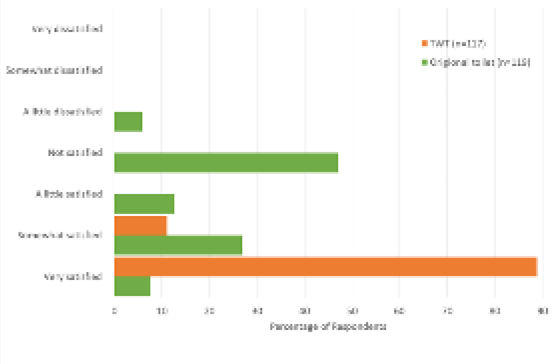
Kachin, Myanmar (2014)

Photo credit: Claire Furlong

Gambella, Ethiopia (2017)

Photo credit: Claire Furlong

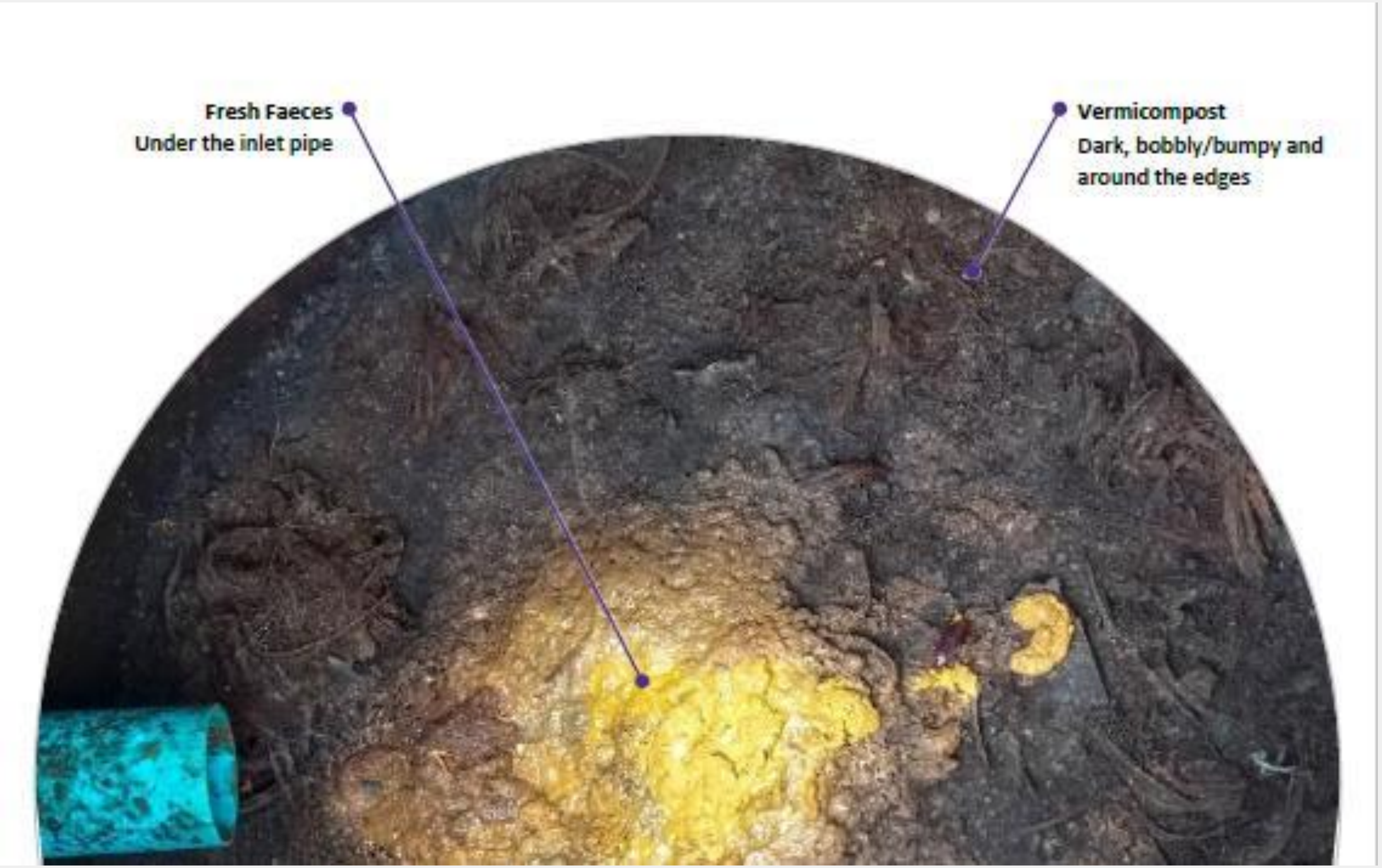
STMG Sittwe, Myanmar (2018)



99% users wanted to continue to use them after the trial

Photo credit: Lucy Polson

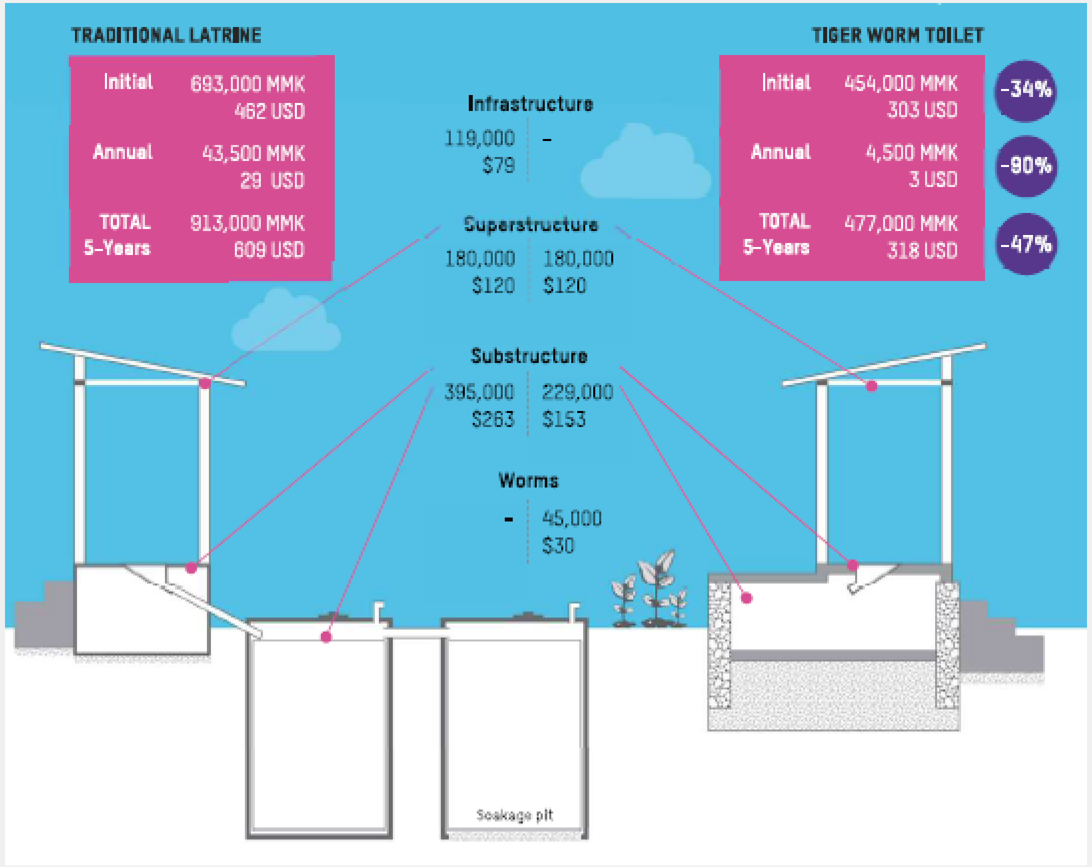
Inside a Tiger Worm Toilet



Costing

- CAPEX
  - Context specific
  - US$175-400
  - Worms costly (US$10-210 per kg)

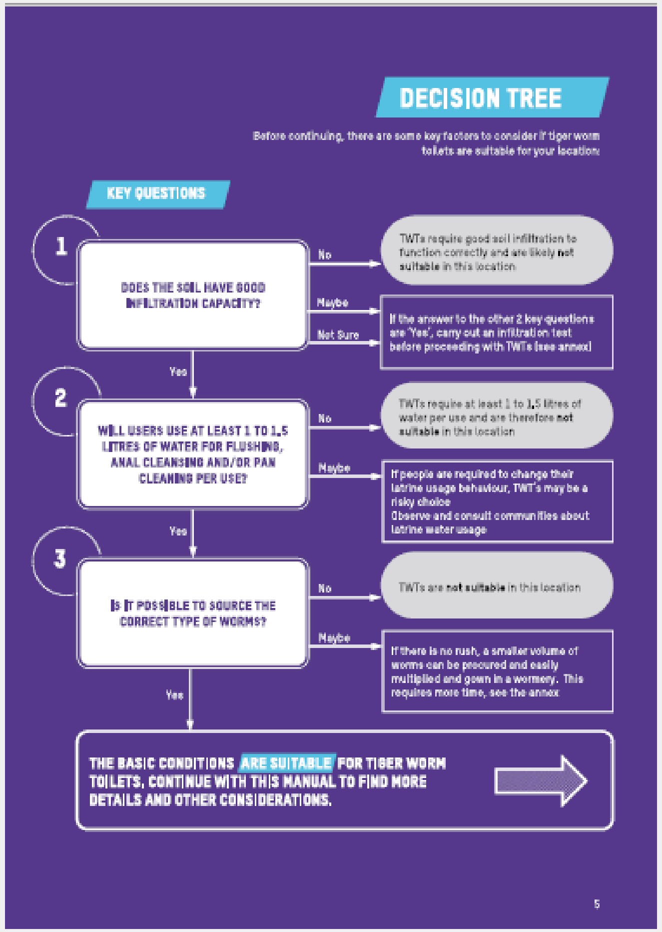
- OPEX
  - Emptying twice a year or every two months
  - Cost emptying US$400 per year +
  - All trails less emptying



Source: Tiger Worm Toilet Manual: Global Relevant Learnings from Myanmar

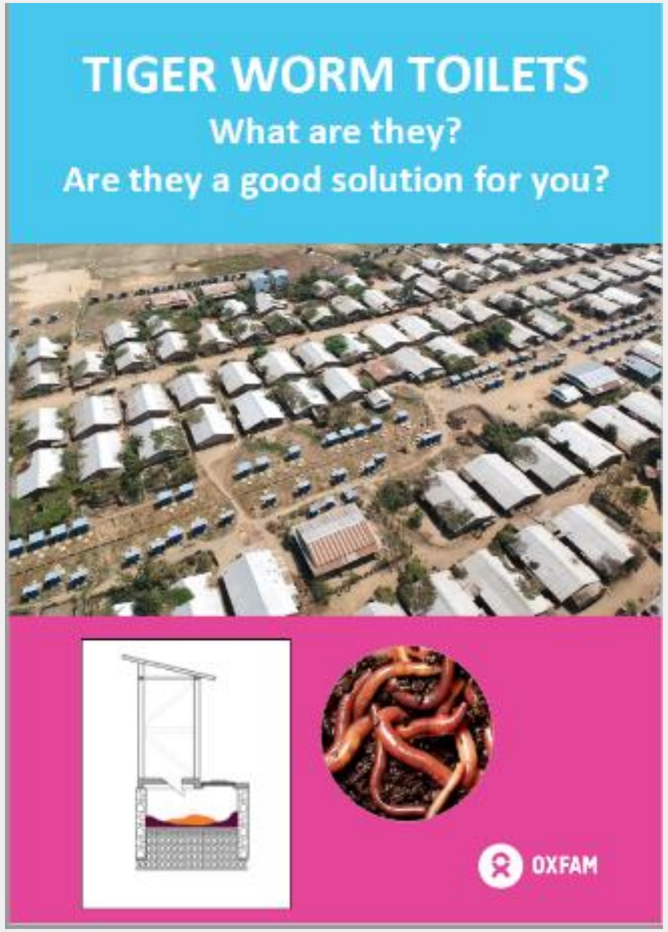
Oxfam's learning to date…

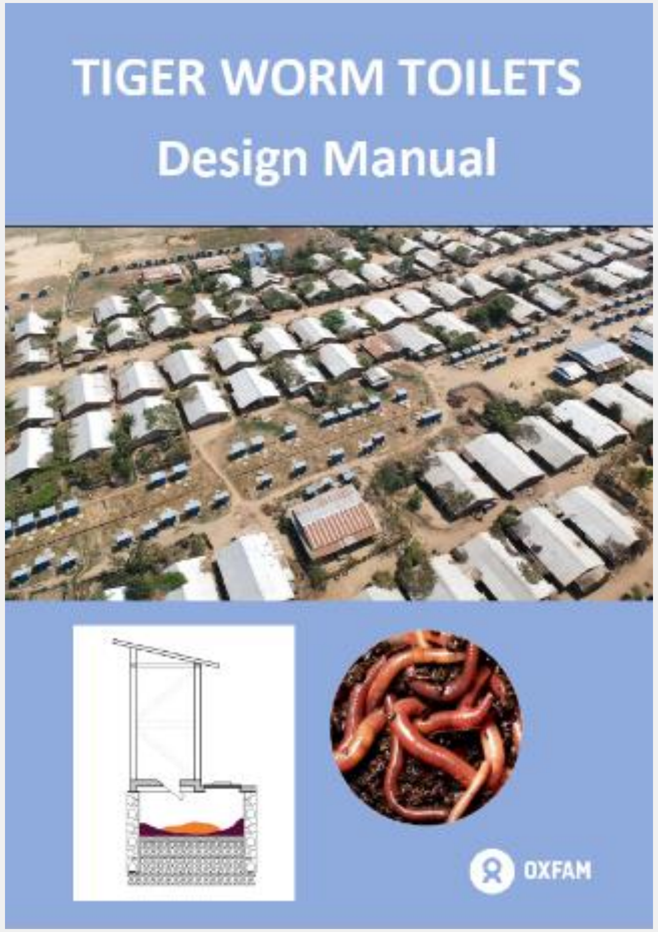
1. Adaptable design
2. Community engagement is key
3. Quality control issues with builds
4. Different worm species can be used
5. Worm supply
6. Monitoring and documenting trials
7. Knowledge management

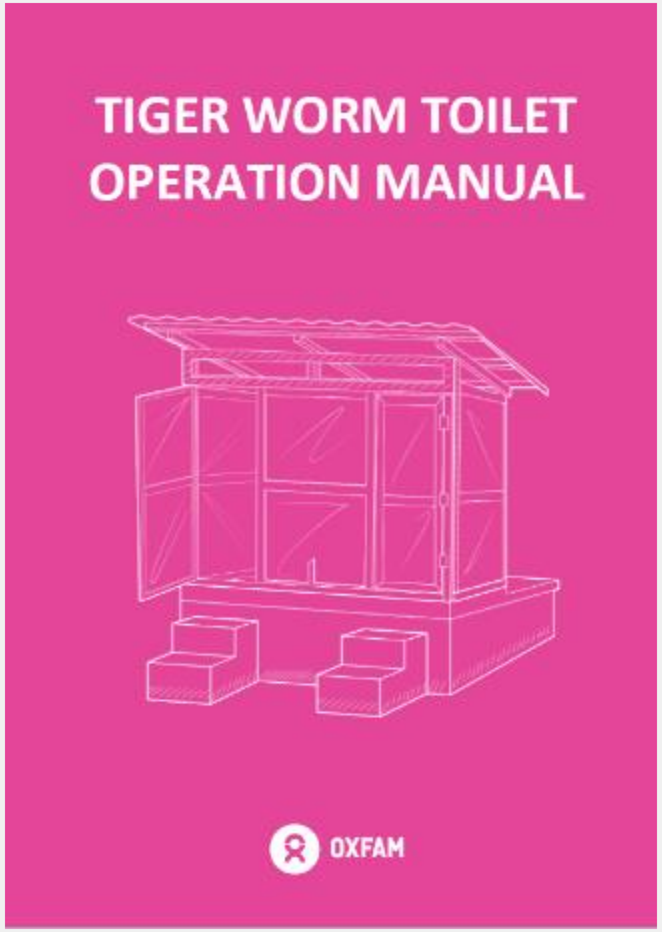


Source: Tiger Worm Toilet Manual: Global Relevant Learnings from Myanmar

Key resources…

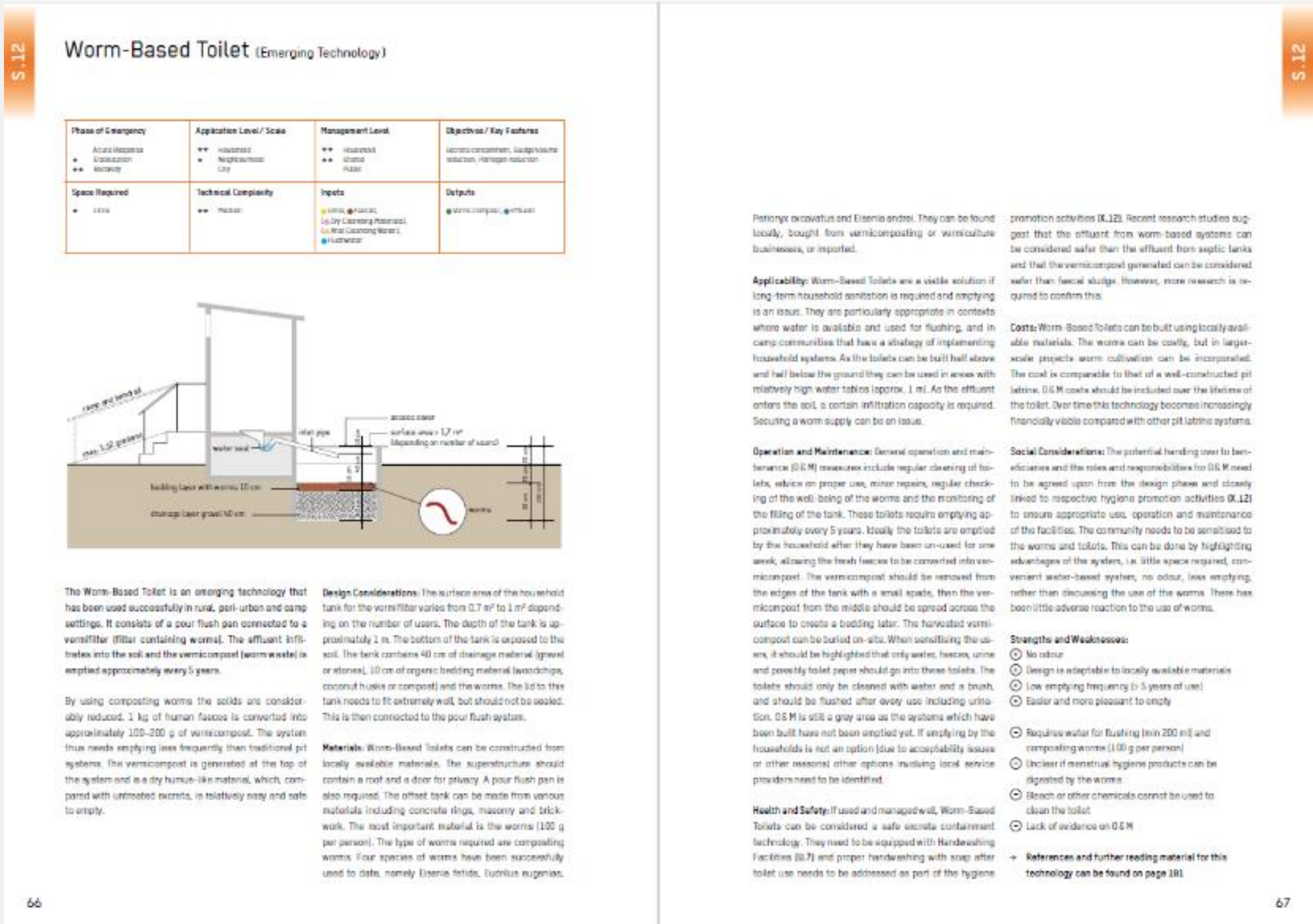






Source: https://www.oxfamwash.org/sanitation/tiger-worm-toilets

Technology mainstreaming…



Who funded this work…

- Bill and Melinda Gates Foundation
- Oxfam’s internal WASH Innovation
- Comic Relief
- EU
- USAID DIV (AID-OAA-F-13-00049)
- UNHCR on ‘Waste to Value Sanitation Solutions in Refugee Camps in East and Horn of Africa’
- Elrha’s Humanitarian Innovation Fund
- Band Aid Trust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OXFAM