

# Harnessing the comparative production economics of ponds and cages for improved aquaculture sector in Uganda

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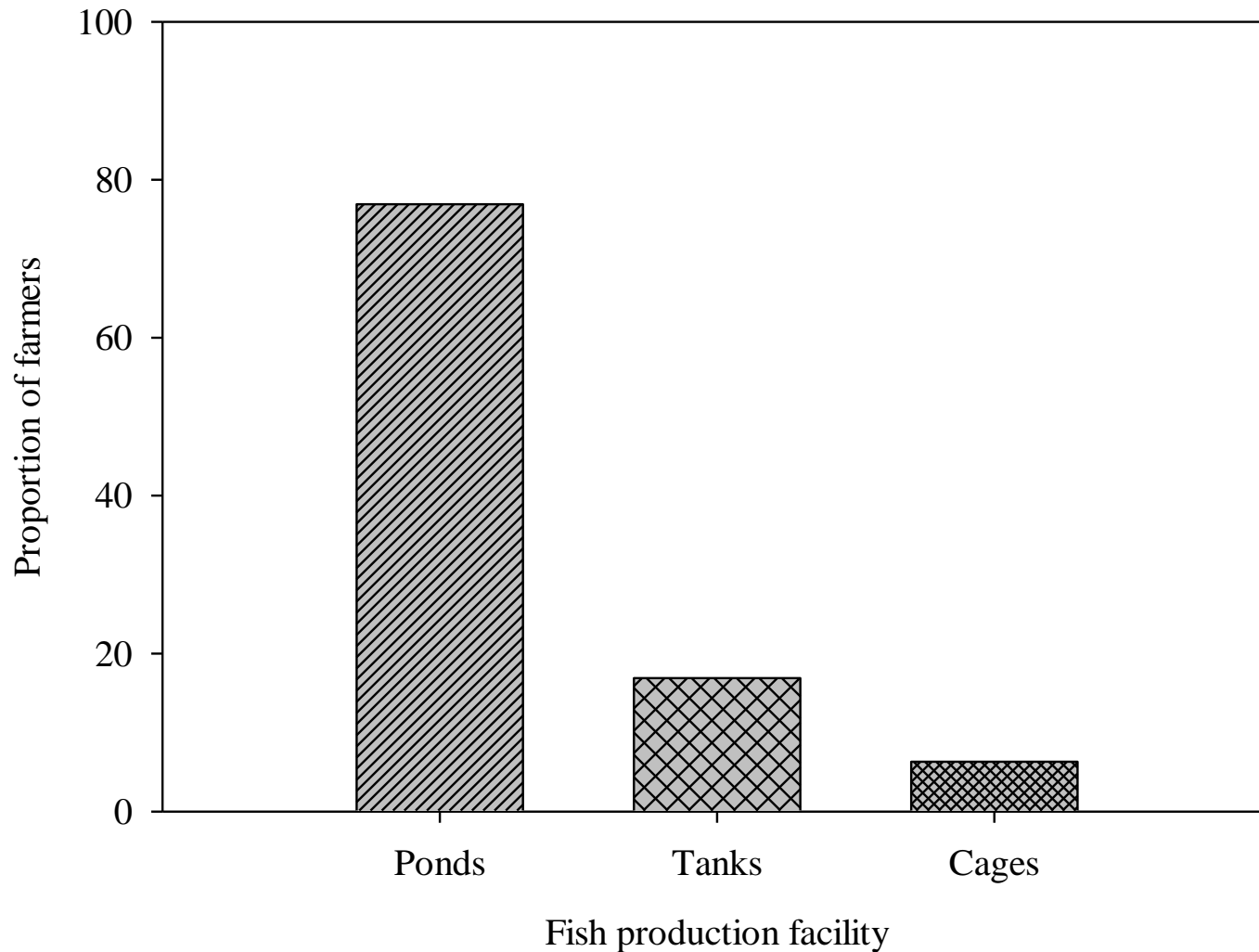
# Aquaculture development in Uganda



a) Pond set up

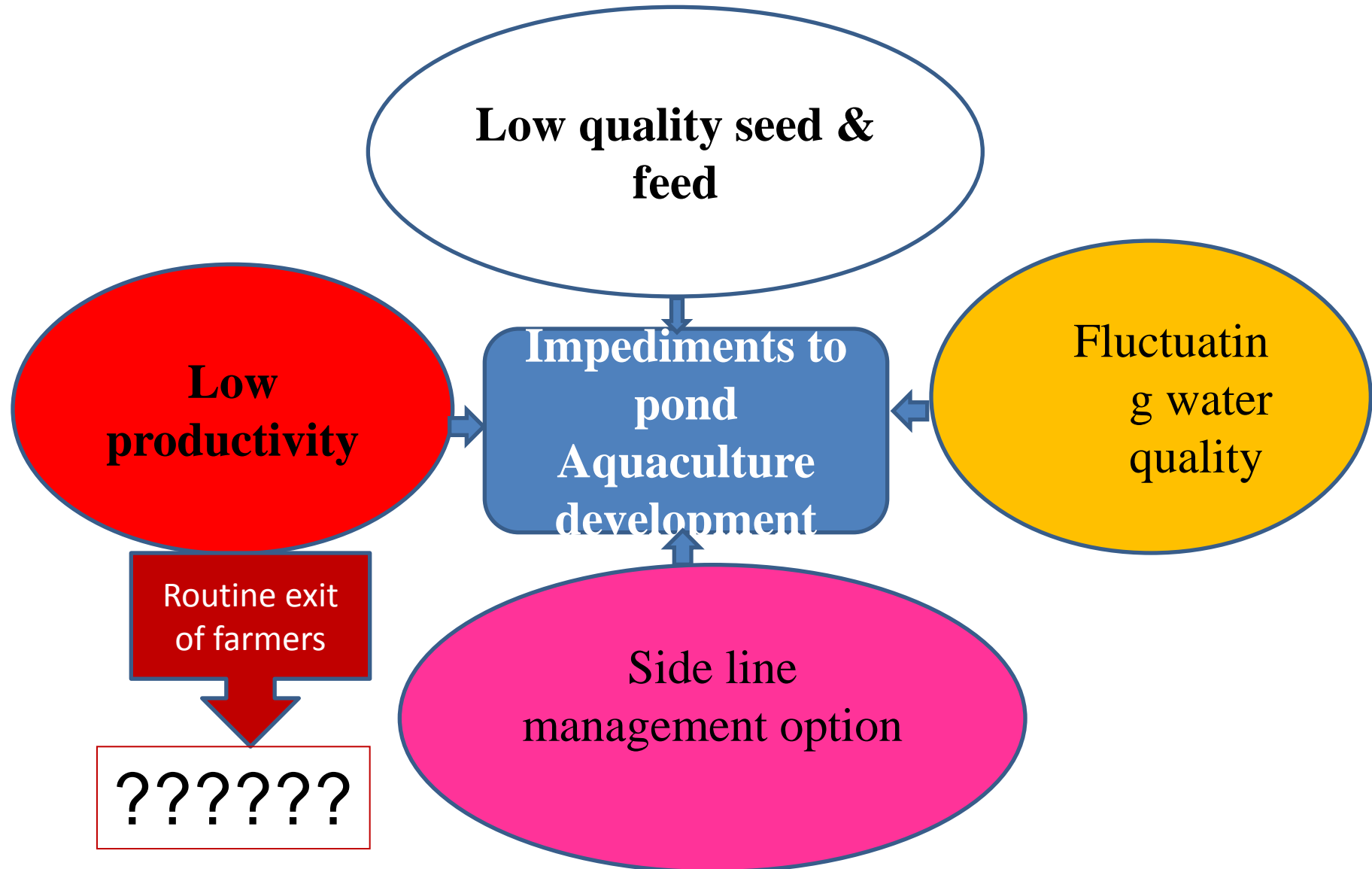


b) Cage set up



**Figure 1: Proportion of fish farmers using different aquaculture production facilities Uganda**

# Impediments to pond aquaculture development



# Pond aquaculture in Uganda

- Characterised by continuous exit of old fish farmers and entry of new/unsuspicious individuals;
- Profitability assessments are contradictory:
  - Some have described the sector as viable/profitable and worthy investment;
  - Some are non committal;
  - While a few have indicated that farmers, and more so grow-out pond fish farmers are making losses.

# Research approach

- A combination of purposive and snowball sampling methods were used,
- Small and medium scale fish farms that had been in operation for at least five years were targeted;
- Farmers, farm managers, and key informants, especially from the input and service sector were interviewed.
- Additional data on ponds and LVHD cages were obtained from farm records

**Table 1: Cost of establishing a 1000 m<sup>2</sup> ready to stock pond**

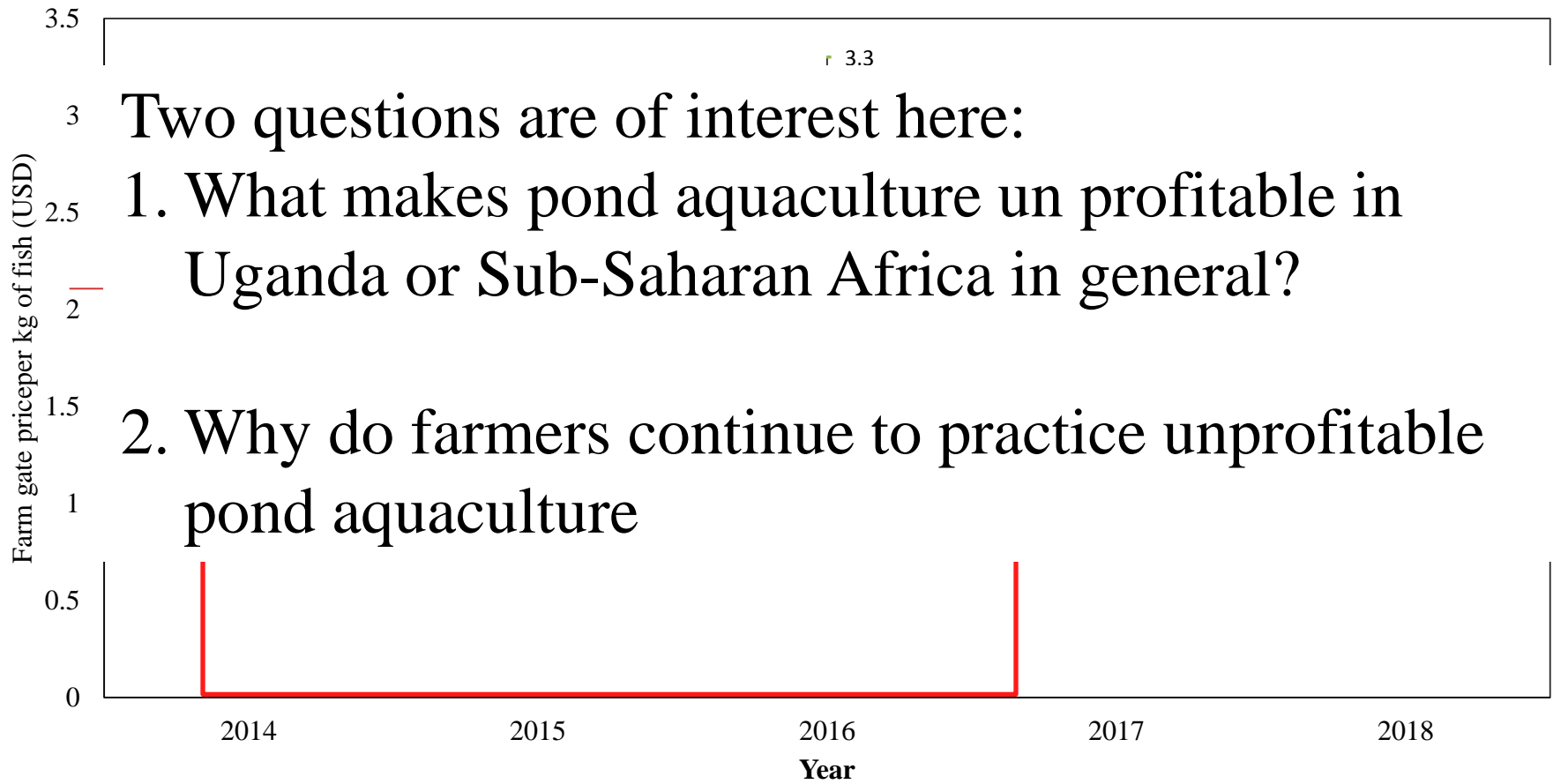
<b>Parameter</b>	<b>Cost (USD)</b>
Aquaculture establishment permits/licences	6
Application fees	1
Pond excavation (8 hours per day)	660
Finishing labour (Man days)	220
Fittings	110
Professional fees	243
Miscellaneous	220
<b>Total</b>	<b>1460</b>

**Table 2: Cost of producing a kg of farmed tilapia in ponds**

<b>Input</b>	<b>Cost per kg of fish produced (USD)</b>	<b>% share</b>
Seed (per piece)	0.2	9.4
Feed (per kg)	1.68	78.9
Others costs	0.25	11.7
<b>Total cost per kg of fish produced</b>	<b>2.13</b>	<b>100</b>



# Table 3: Farm gate prices per kg of farmed Nile tilapia from 2014 to 2018



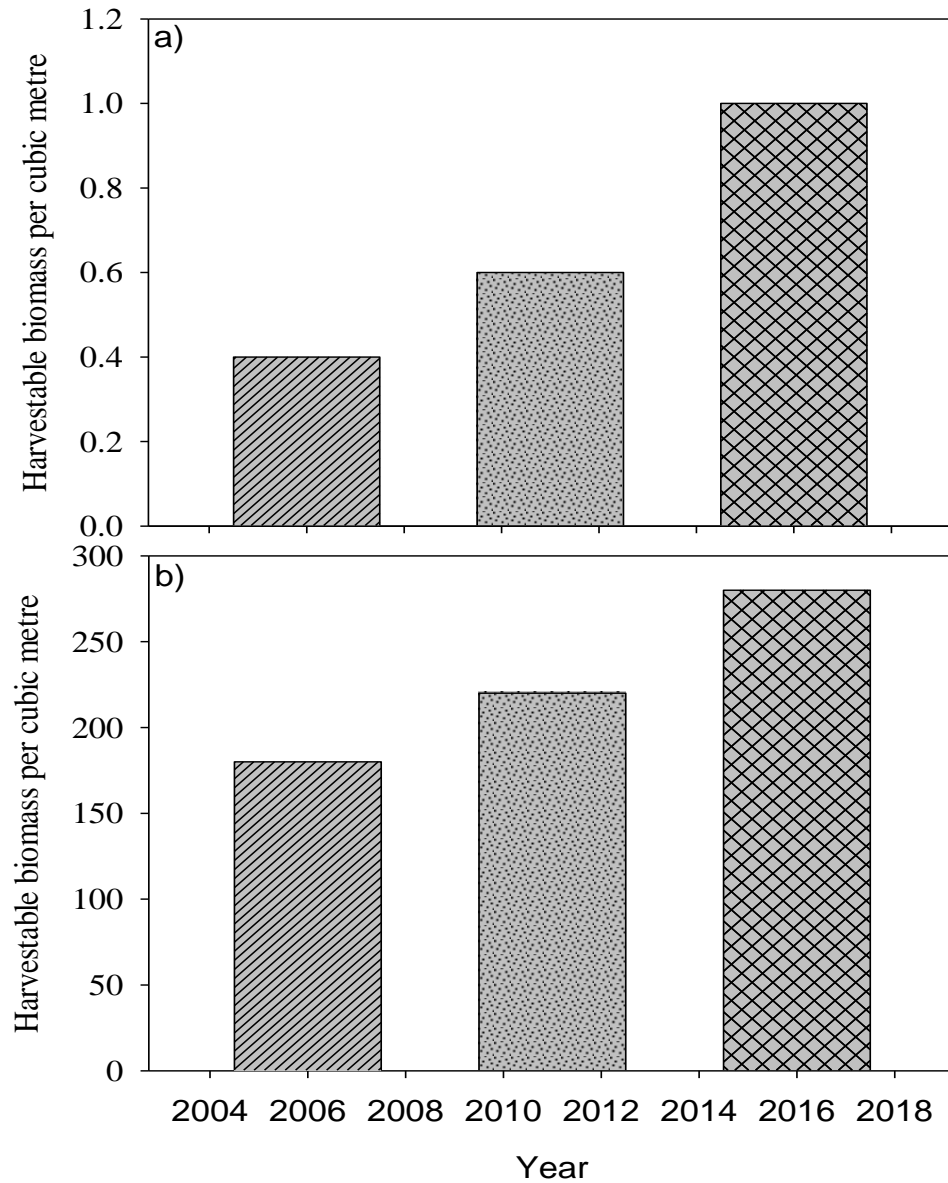
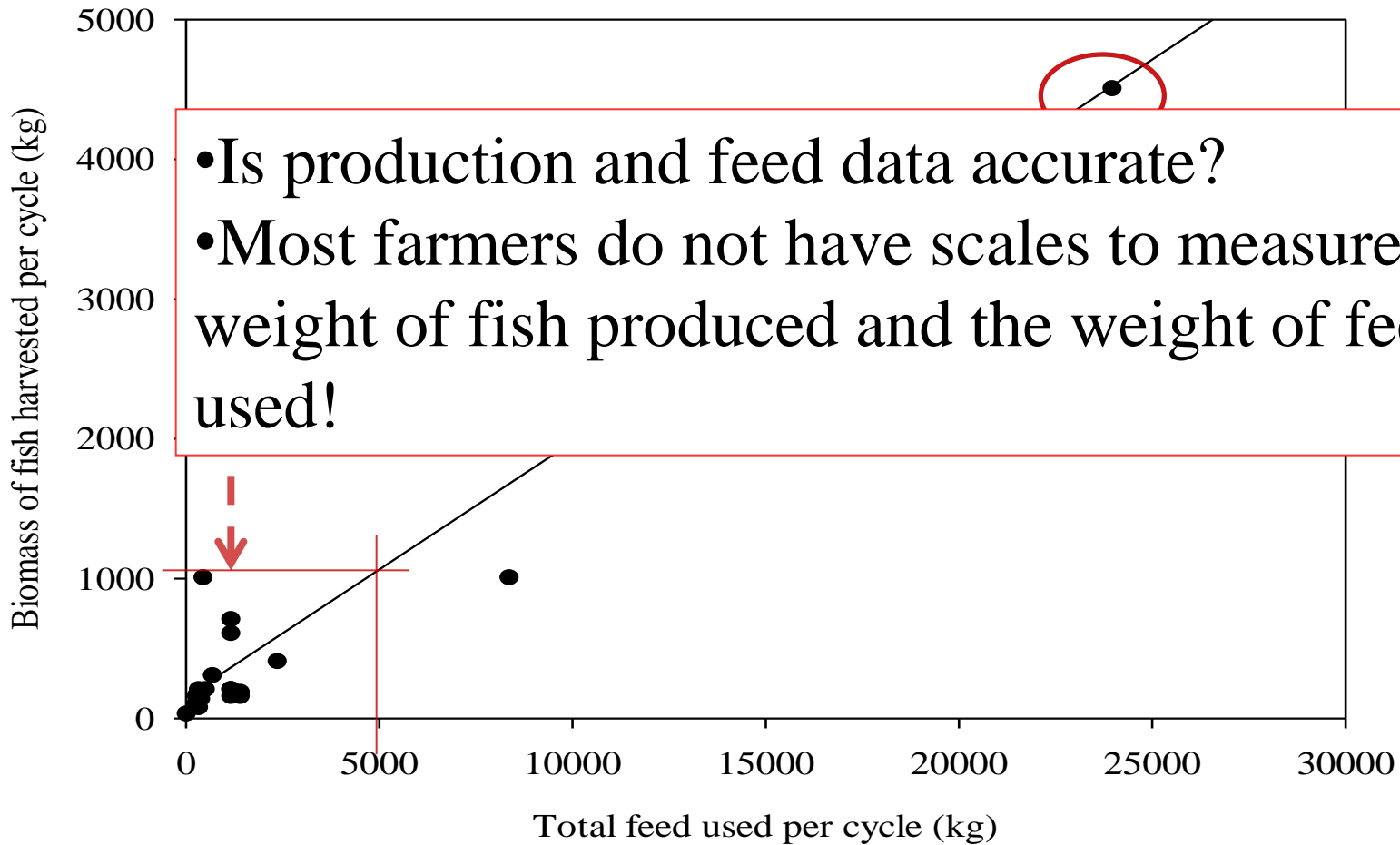


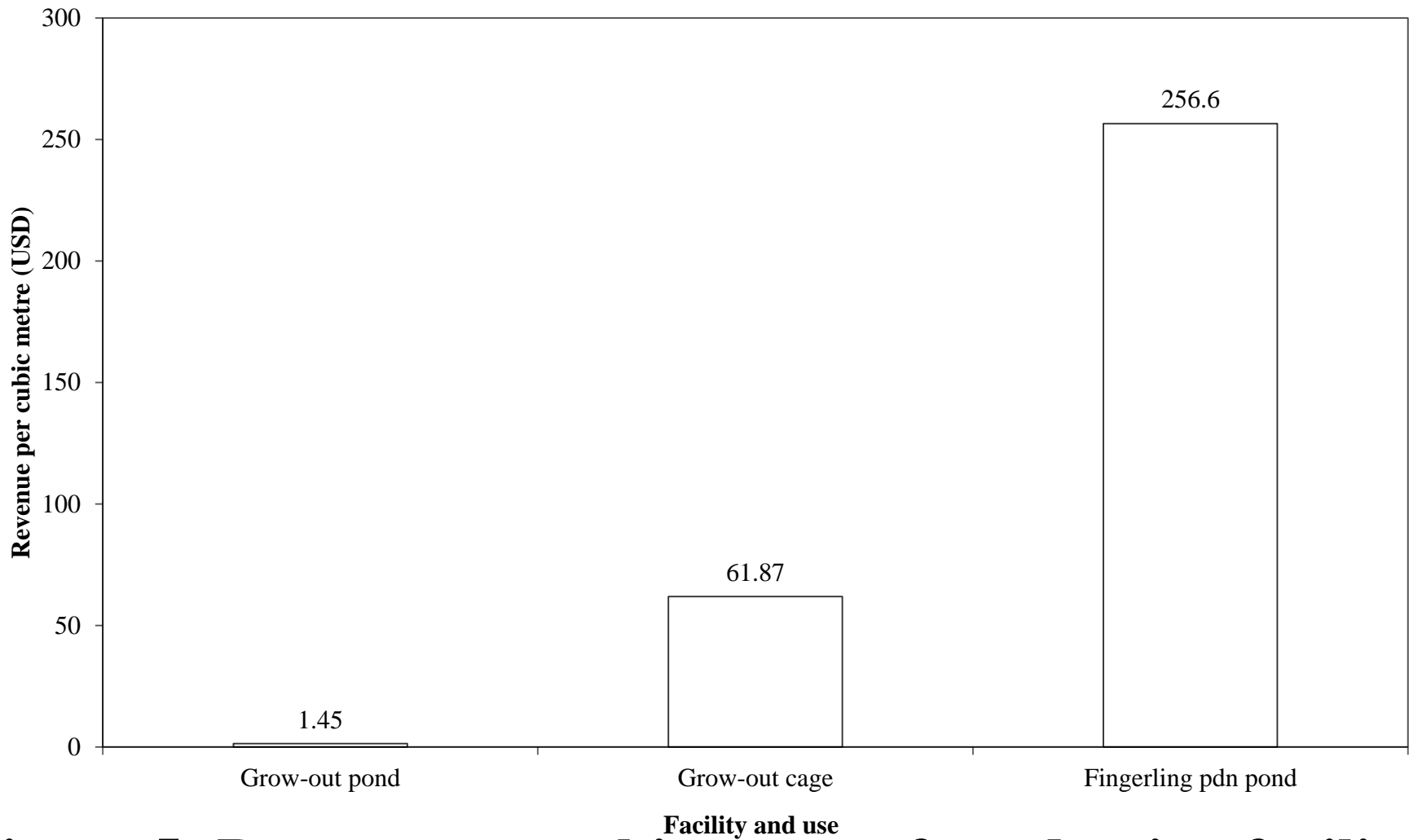
Figure 3: Biomass harvested per cubic metre of a) pond and b) cage



**Figure 4: Fish production vs feed used in pond fish farm**

# Table 4: Productivity of grow-out ponds and cages in Uganda

Parameter	Pond	LDHV Cage
Common facility volume (m <sup>3</sup> )	1000	22.5
Fixed cost of establishment (USD)	1460	800
<b>Cost/cubic metre</b>	<b>1.46</b>	<b>35.6</b>
<b>Variable costs/kg of fish produced</b>	<b>2.13</b>	<b>1.1</b>
Number of fish stocked	2500	2100
Body mass of stocked Nile tilapia (kg)	0.002	0.008
Stocked biomass (kg)/m <sup>3</sup>	0.005	0.75
<b>Survival (%)</b>	<b>0.6</b>	<b>0.72</b>
Average body mass harvested	0.42	0.4
Total harvestable biomass (kg)	630	604.8
Biomass harvested per cubic metre (kg)	0.63	26.88
Production duration (months)	9-14	6-8
<b>Production cycles per year</b>	<b>1</b>	<b>2</b>
Fish per kg harvested	2.4	2.5
<b>Average farm gate price (USD)</b>	<b>2.3</b>	<b>2.3</b>
Total revenue (USD)	1449.0	1391.0
Total variable costs (USD)	1341.9	665.3
<b>Gross profit above variable costs (USD)</b>	<b>107.1</b>	<b>725.8</b>
<b>Profit margin per kg of fish above variable costs (USD)</b>	<b>0.17</b>	<b>1.2</b>



**Figure 5: Revenue per cubic metre of production facility put to use**

# Main lessons

- There is a likelihood that most grow-out pond fish farmers in Uganda, and probably in Sub-Saharan Africa as a whole are making losses;
- Low pond productivity/un profitability seems to be more of a management issue than facility problem;
- Ponds appear to be more lucrative for tilapia fingerling production than for grow outs;
- LVHD cages are better for grow-out tilapia farming in Uganda than ponds, even though investment cost seems higher

# Our opinion

- Pond aquaculture can do better in Uganda and/or Sub-Saharan Africa if management is improved;
- Cage culture establishment may be expensive to smallholder farmers;
- Communal ownership and management of cages could be feasible among smallholders farmers;
- Some investment and management costs for cages could be shared.

Ugandan and/or Sub-Saharan Africa  
fish farmers **MUST** adopt to the  
changing world by turning their  
challenges into opportunities



IIFET 2018  
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*Adapting to a Changing World:  
Challenges AND Opportunities*