Developing Smallholder Aquaculture In Kenya Into Viable Enterprises: A Case Study of Nyaguta Fish Ponds In Kisii, Kenya.

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Nyaguta Star SHG

Presentation Outline

- Why smallholder fish farming
- Problem statement
- Objectives
- Study area
- Approach
- Result & Discussion
- Conclusion
- Recommendation
- Acknowledgement

Why smallholder fish farming in rural communities?

Has been shown to contribute to:

- Improved nutrition, incomes and improved livelihoods
- Water management and environmental health
- Local and national economic growth
- Poverty reduction (social stability and security)
- Scale: local (Nyaguta), regional (Western), national

Aquaculture production in Kenya

- Total aquaculture production by farmers in Kenya is low now standing at (12,000 tones annually).
- There is poor or no record keeping by fish farmers so it is difficult to know the exact annual yield
- Mainly "subsistence" fish farming (need to move to commercial fish farming)

Problem statement

The extent to which farmers know how to produce fish is constrained by technical, economic, social and environmental variables .

(There is need to identify these variables and design local farming systems to improve the yields).

Overall objective

To determine the profitability of fish pond farming systems through a comprehensive and experimental approach of fish farmer's practices at Nyaguta fish ponds in Kisii, Kenya

Specific objectives

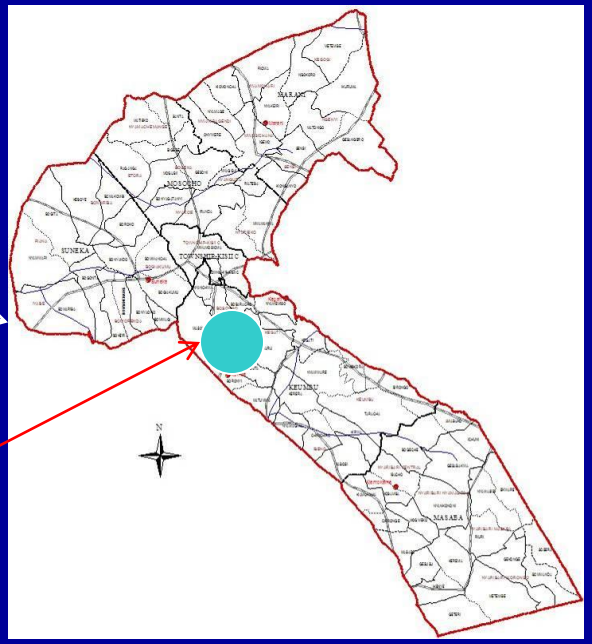
- To monitor production (fish pond) cycle and determine the main fish rearing parameters with the farmers
- To characterize the inputs used by fish farmers (types, amounts and costs)
- To record and cost labor used
- To take an inventory and cost other inputs/activities
- To determine the net income

Study area

Africa map

Map of Kenya

Nyaguta



Map of Kisii Central

Approach:
Identified group of farmers' to work with in study area (Nyaguta Star SHG)

- A registered group of farmers (Nyaguta Star SHG) was identified.
- The group had gender parity (men, women and youth), involved in fish farming among other activities.
- Each was a beneficiary of the government subsidy, Economic Stimulus Program (ESP)
- ESP package: 1 earthen pond of size 300m^2 constructed for each farmer, stocking with 900 mono-sex tilapia fingerlings and supply of pellet feeds

Approach Conti….

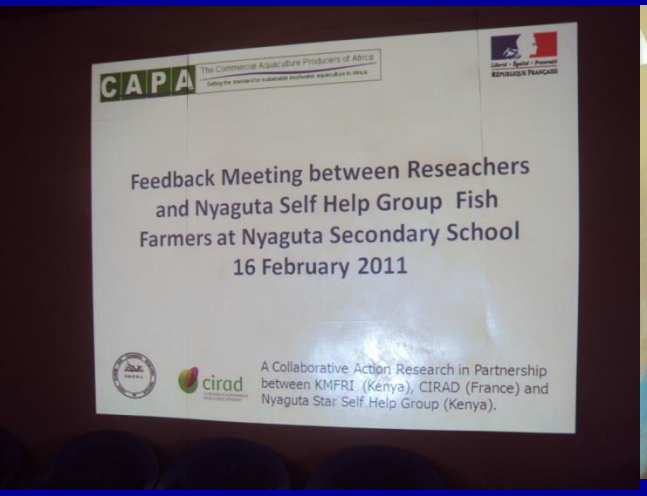
- Selected farmers signed an agreement (farmer obligations: individually and collectively, also researchers' obligations defined)
- Farmers were trained on a number of aspects to realize the objectives (pond husbandry, sampling for growth, record keeping, etc)
- Feedback meetings held (researchers farmers) to exchange /share individual experiences

Feedback meetings (farmers/researchers)

Share individual experiences

Learn from each other

Ask questions on technical issues



Pond Monitoring

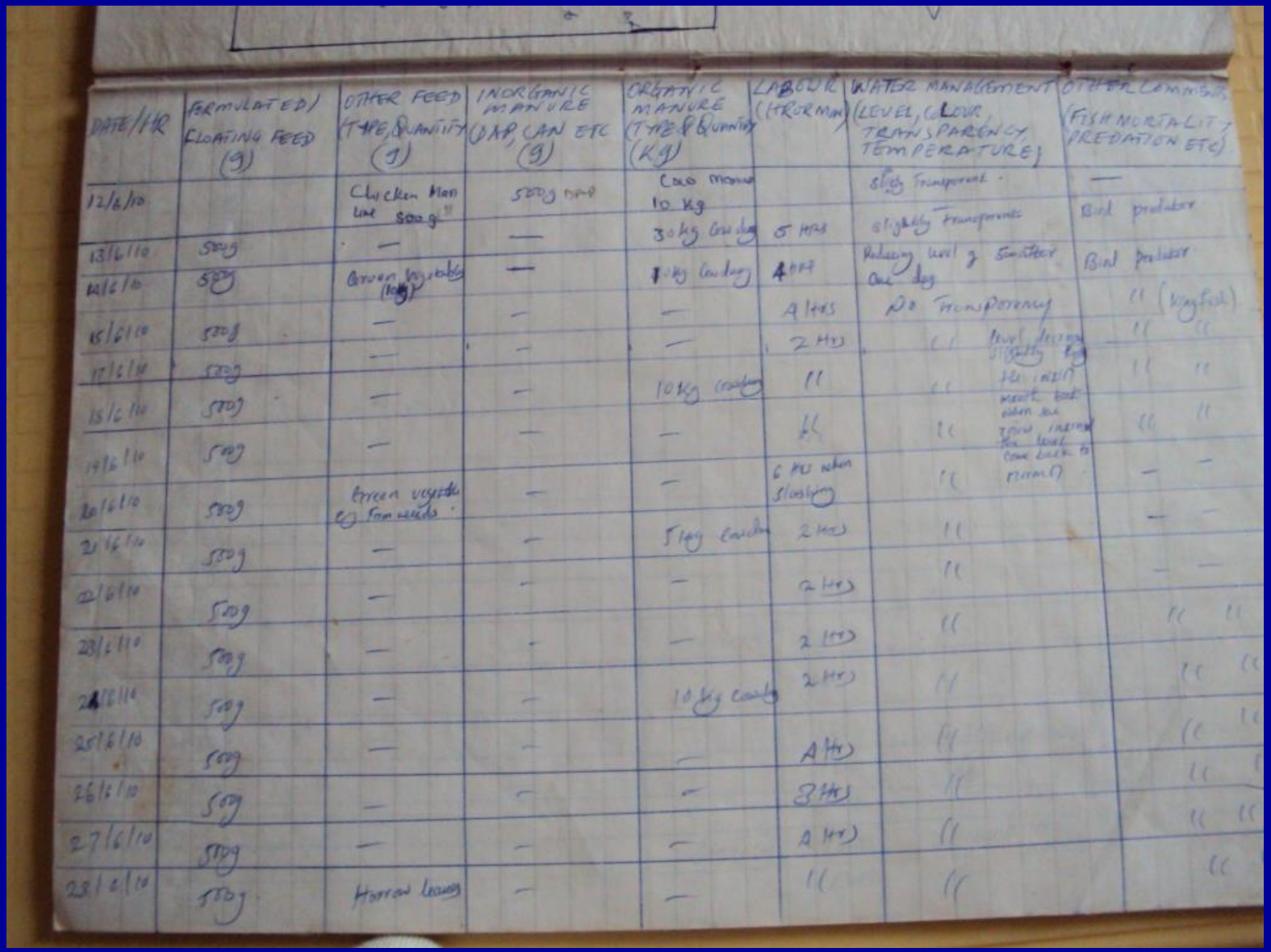
- a) monitoring water physical parameters
- b)Characterizing the inputs with the farmers
- c) Sampling the ponds for fish growth
- d)Record keeping (data collection: inputs, feeds, labour, harvest, etc)

RESULTS AND DISCUSSION

Economic analysis

An enterprise budget was developed for each production pond/farm to estimate the average costs and returns per cycle

Data recording by and with the farmers



DATE/HR	FORMULATED/ FLOATING FEED (g)	OTHER FEED TYPE, QUANTITY (g)	INORGANIC MANURE (BAG, CAN ETC) (g)	ORGANIC MANURE (TYPE & QUANTITY) (Kg)	LABOUR (HR OR MIN)	WATER MANAGEMENT (LEVEL, COLOUR, TRANSPARENCY, TEMPERATURE)	OTHER COMMENTS (FISH MORTALITY, PREDATION ETC)
12/6/10		Chicken blood 500g	500g DAP	Cow manure 10 kg		slightly transparent	—
13/6/10	500g	—	—	30 kg cow dung	5 HRS	slightly transparent	Bird predator
14/6/10	500g	Green vegetable (kg)	—	1 kg cow dung	4 HRS	Reducing level & sunlight one day	Bird predator
15/6/10	500g	—	—	—	4 HRS	No Transparency	" (Kingfish)
17/6/10	500g	—	—	—	2 HRS	" level decreasing slightly by	" "
18/6/10	500g	—	—	10 kg cow dung	"	" the level went but when we	" "
19/6/10	500g	—	—	—	"	" pour inside the level come back to	" "
20/6/10	500g	Green vegetable e.g. Fresh weeds	—	—	6 HRS when slashing	" normal	— —
21/6/10	500g	—	—	5 kg cow dung	2 HRS	"	— —
22/6/10	500g	—	—	—	2 HRS	"	— —
23/6/10	500g	—	—	—	2 HRS	"	" "
24/6/10	500g	—	—	10 kg cow dung	2 HRS	"	" "
25/6/10	500g	—	—	—	4 HRS	"	" "
26/6/10	500g	—	—	—	3 HRS	"	" "
27/6/10	500g	—	—	—	4 HRS	"	" "
28/6/10	500g	Harrow leaves	—	—	"	"	"

Assessment of the fish cycle with farmers

	Unit	Quantity (kg)	Price U. (Kshs)	Total value (Kshs)
Revenue				
Catfish sales				
Tilapias sales		200 ?	100 ?	20 000 ?
Total Income (TI)				
Variable Costs				
Fingerlings	piece	900	3	2 700
Artificial Fish Feeds (extruded pellet)	20 kg	4	1200	4 800
Chick Mash	kg	118,5		
Organic Fertilizer	kg	80		
DAP	kg	10		
CAN	kg	6		
Casual labour				
Total Variable Costs (TVC)				
Family Labour Costs				
Field labour: stock,feed,fertilize,harvest	Hour	111		
Maintenance labour: dyke repairs, levee repairs, after draining				
Total Family Labour Costs (TFLC)				
Net Income				
Without family labour costs (TI-TVC)				
With total costs (TI-TVC-TFLC)				

Information Extracted from Records kept by farmers

Summary of Income from farmers (Kshs)

Initials of farmers' pond	Revenue (Kshs)	Net Income (NI) with subsidies (Kshs)	Net Income (NI) without subsidies (Kshs)
	Kshs (1USD = Kshs 78)		
SO	30,300	12,124	4,624
CO	27,050	13,229	5,729
JN	34,200	25,800	18,300
LN	16,500	8,519	1,019
WO	6,950	4,841	-2,659
YM	22,200	18,882	11,382

Conclusion

- The farmers developed **some capacity** to discern the problems either biotechnical or socioeconomic and improve on their operations accordingly- with assistance of EA/researchers.

- The fish pond farmers now know the importance of keeping records of their operations

- The records analyzed with the farmers gave an insight into the status of their pond/farm

Conclusion conti….

- Each farmer was able to understand the results of his/her practices and to determine profits/losses during the production cycle/period
- The first cycle was **apparently profitable** (+/-) for most farmers but not viable
- However, motivated by the enterprise being potentially profitable, the smallholder fish ponds can be transformed by way of up-scaling into commercial ventures/entities and consequently co-building with the researchers a sustainable local fish farming model

Recommendations

- To build a sustainable local fish farming model with the farmers

Modeling the fish production cycle (stocking density, inputs level and final weight)

To determine the role of the fish pond system in the farming system (and others activities)

Build resilience of the fish pond communities

(Use cross-sectoral approach to address the complexity of issues and threats)

Acknowledgement

The research was carried out as a collaborative research initiative under the auspices of KMFRI/CIRAD/ French Embassy/CAPA and Nyaguta Star Self Help Group Farmers.

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Thank you!

Asante sana

Karibu EAC
Welcome to EAC

Nyaguta farmers happy with their bumper harvest