

Integrated farming systems in Kinshasa (DRC)

Diversity of agricultural practices

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Introduction

- In Kinshasa in the Democratic Republic of the Congo (DRC), integrated livestock and fish farming could provide an interesting option for ecological intensification of production systems.
- This practice noticeable on the field is not documented.
- The aim of this work was to **characterize** the extend to which fish farming is integrated with other agricultural practices and how they benefit from interactions.

Materials and methods

- Assessment of the density of fish farms using satellite images (google.maps) and on-field verification (Figure 2)
- Survey of 149 farmers with at least one pond and located in two peri-urban (Funa. Ndjili) and one rural area (Mbankana) in March-May 2013



Figure 2. Satellite image of the Funa valley (Urban 1, Mont-Ngafula)

Table 1. Average areas dedicated to each component and number of tropical livestock units (TLU) on the farm according to location and specialization

	Number of ponds	Total ponds area (m ²)	Vegetable area (m ²)	TLU
Urban 1				
Fish farming	2.7	10796	-	-
Fish + livestock farming	1.2	414	-	1.5
Fish + livestock + vegetable	1.8	685	94	2.1
Fish + vegetable farming	2.2	494	78	-
Urban 2				
Fish farming	1.7	339	-	0.1
Fish + livestock farming	3.8	1246	-	0.3
Fish + livestock + vegetable	2.6	471	93.3	2.1
Fish + vegetable farming	1.6	408	47.3	0.4
Rural				
Fish farming	3	477	-	-
Fish + livestock farming	3.9	861	-	5.1
Fish + livestock + vegetable	1.8	415	53.9	2.5
Fish + vegetable farming	2.5	392	59	-

Conclusion and future prospects

- Practice of agriculture in synergy with pig and fish farming is a common practice among pond holders.
- Optimal integration of the different components requires a better quantification of the flows and their beneficial as well as detrimental impact (e.g. fertilization vs. pond water eutrophication) through a long-lasting follow-up
- Appropriate modeling could help in advising the farmers which flows are the most critical to sustain the highest production levels.



Figure 1. Pig and fish pond in Mbankana

Results

- > 3000 fish ponds spotted on the urban territory of Kinshasa
- Livestock and fish farming are present in 46 % of the sample of pond holders (Figure 3)
- The rural area displays a higher number of ponds and TLU per farm (Table 1)
- 10 major flows are observed between the different components, not all are valorized by all farmers (Table 2)

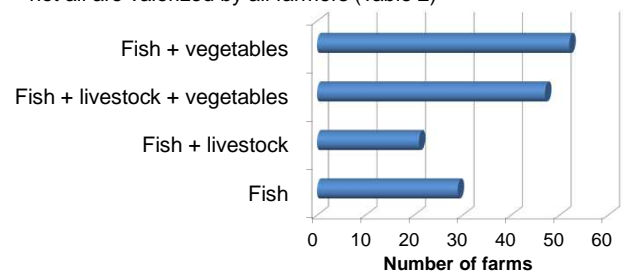


Figure 3. Number of farms per specialization type

Table 2. Frequency (%) of flows valorized according to location and specialization

Major flows	Fish + livestock farming			Fish + livestock + vegetable farming			χ ²
	Urban 1 N=10	Urban 2 N=4	Rural N=7	Urban 1 N=15	Urban 2 N=16	Rural N=16	
Manure used for :	%	%	%	%	%	%	
Pond fertilization	50	0	71	80	50	44	0.11
Vegetable farming				92	69	71	0.57
Composting	0	0	0	0	6	0	-
Pond used for :							
Fertilizing vegetable with mud	13	0	0	18	11	11	0.54
Watering animals	0	0	33	33	25	21	0.15
Cleaning pigsty	11	100	17	40	27	10	0.77
Composting helophytes plants	17	0	0	44	43	20	0.74
Feeding helophytes plants to livestock	17	0	0	10	0	0	0.73
Vegetable wastes used as :							
Animal feed (pig, fish)	-	-	-	21	47	20	0.01
Pond fertilizer	-	-	-	0	7	0	0.06

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