

Value Chain Analysis of the Egyptian Aquaculture Sector

Ahmed Nasr-Alla (WorldFish Center)

IIFET

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Background

Fish is cheapest Animal Source Food for Egyptian consumers

1997

- 73,400 tonnes
- 10 kg fish person⁻¹ y⁻¹

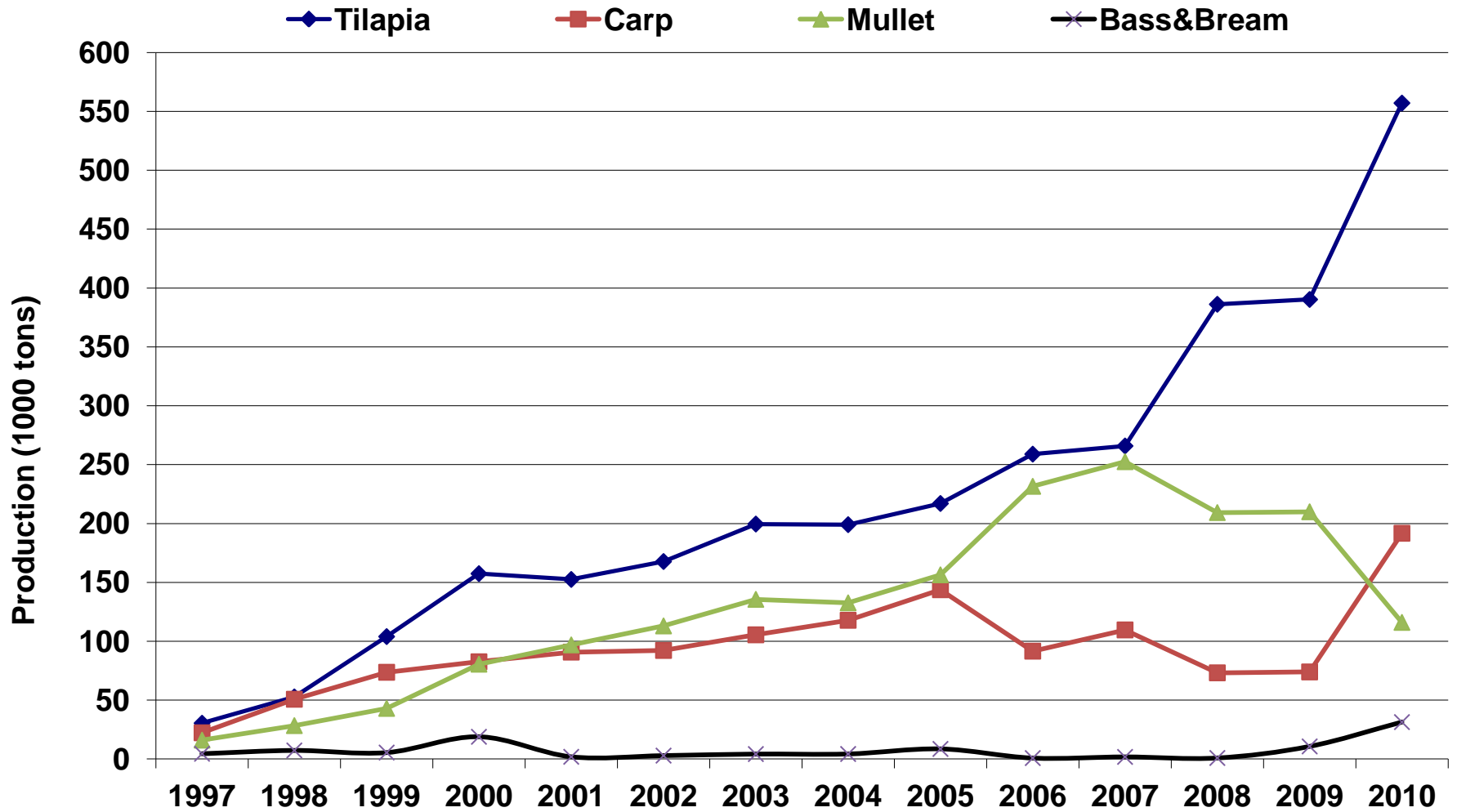
2010

- 921,585 tonnes
- 19.8 kg fish person⁻¹ y⁻¹

- 65% of Africa's aquaculture
- Employs ≈200,000 people



Egyptian Aquaculture, Species.



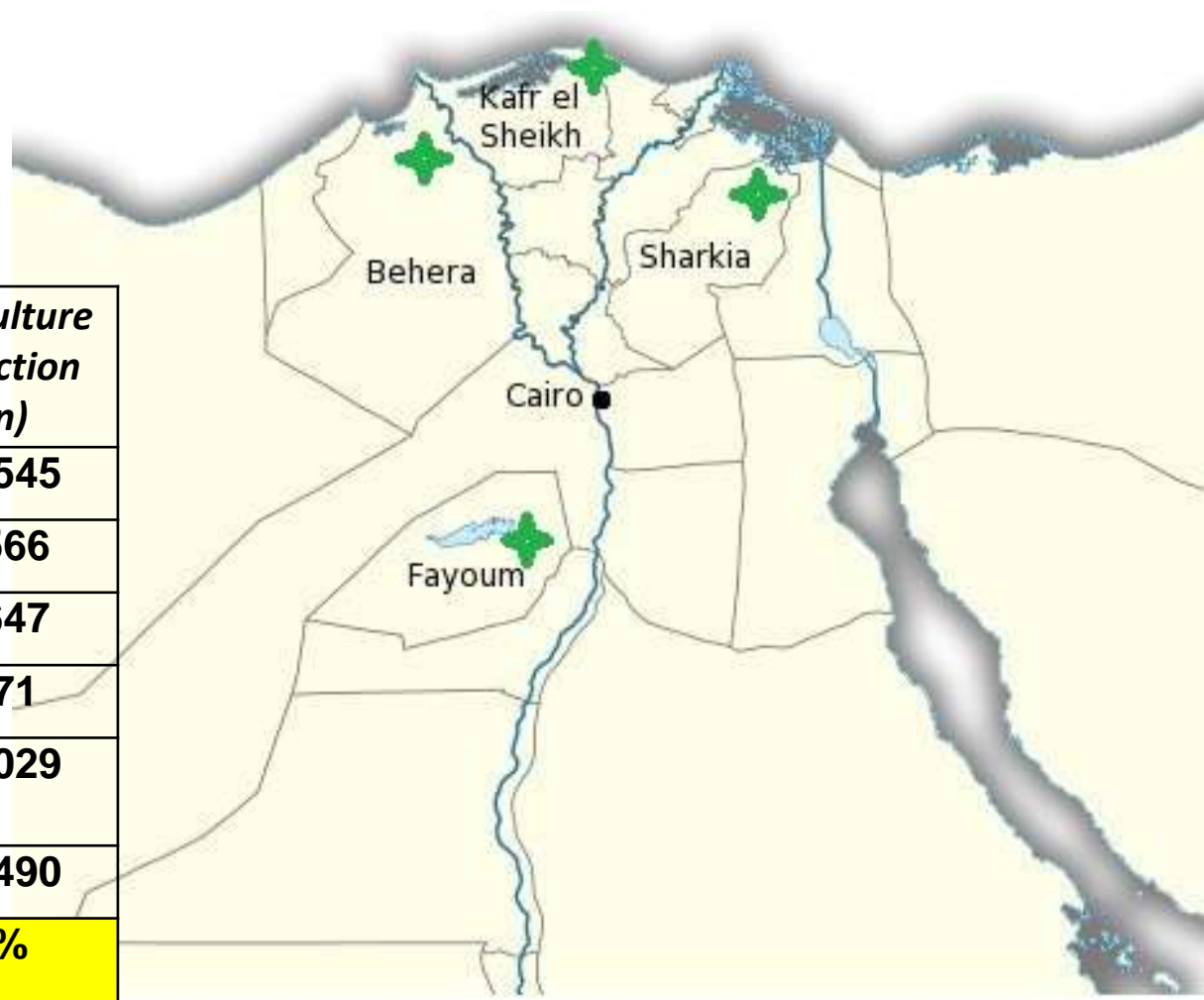
Aim of A V C study in Egypt

To better understand and document, pond fish farming value-chain in Egypt :

- **map the value-chain to describe the main stakeholders and the flow of product;**
- **understand the costs and earnings and financial performance of the different sub-sectors/links of the value-chain;**
- **consider the employment generated by the sector; and**
- **identify the key constraints and problems impacting on different actors in the value-chain.**

Study areas

| <i>Governorates</i> | <i>Fish-Farm area (ha)</i> | <i>Aquaculture Production (ton)</i> |
|---------------------------|----------------------------|-------------------------------------|
| Kafr El-Sheikh | 60,365 | 367,545 |
| Beheira | 12,696 | 66,566 |
| Sharkia | 14,663 | 82,647 |
| Fayoum | 1,145 | 6,271 |
| Subtotal (4 Governorates) | 88,869 | 523,029 |
| <u>Egypt</u> (Total) | 151,757 | 705,490 |
| Percentage to country | 59% | 74% |



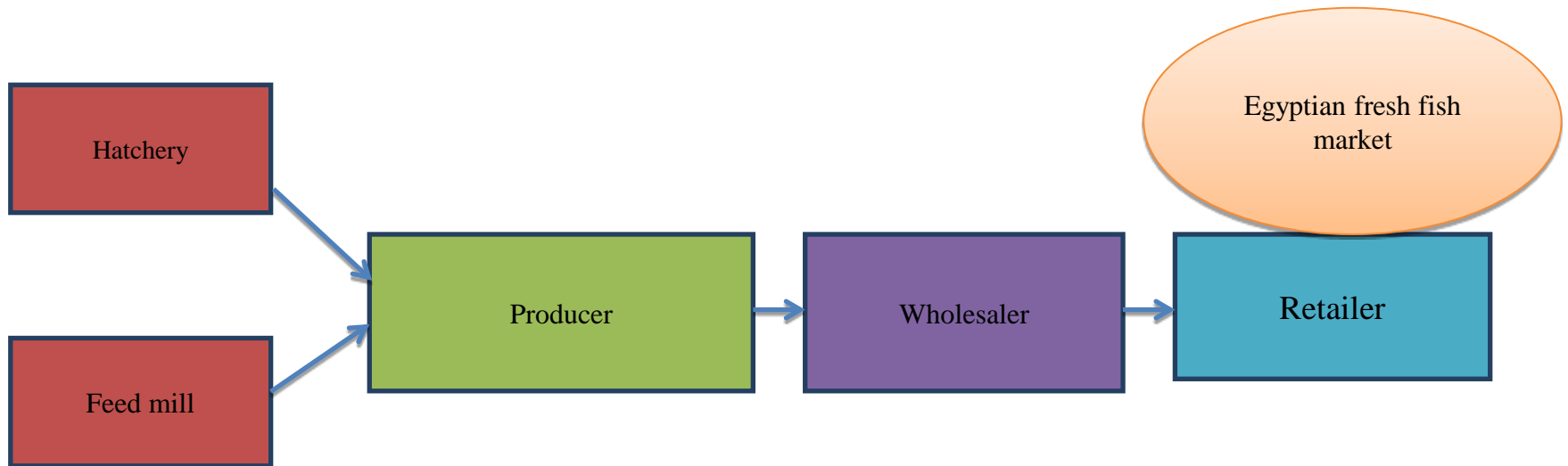
The Aquaculture Value Chain, Egypt

Sample frame used during the study

| Governorate | Fish Farmers | Fish Traders and/or Wholesalers | Fish Retailers |
|-----------------------|---|---|-------------------------------------|
| Kafr el Sheikh | 22 individual questionnaires 3 focus groups (total of 24 participants) | 6 individual questionnaires 1 focus group (8 participants) | 5 individual questionnaires |
| Behera | 14 individual questionnaires 1 focus group (15 participants) | 5 individual questionnaires 1 focus group (9 participants) | - |
| Fayoum | 16 individual questionnaires 1 focus group (29 participants) | 4 individual questionnaires | 7 individual questionnaires |
| Sharkia | 9 individual questionnaires 1 focus group (12 participants) | 6 individual questionnaires | 1 individual questionnaire |
| Totals | 61 individual questionnaires 6 focus groups (total of 80 participants) | 21 individual questionnaires 2 focus groups (total of 17 participants) | 13 individual questionnaires |

The Aquaculture Value Chain, Egypt Result;

- Short and simple VC



The Aquaculture Value Chain, Egypt

Fish Farms

- Stock in April and harvest in Sep–Dec i.e. 8-9 months
- All product sold live, or fresh (w/wo ice)
- 8.3 full-time jobs per 100 tonnes sold
- Av. size 265 g tilapia,

Sell /
deliver
to

Fish traders/ wholesalers

- Keep fish for <1 day
-
- All product sold live, or fresh (w/wo ice)
- 0.9 full-time jobs per 100 tonnes sold

Sell /
deliver
to

Retail Sector (and food service sectors)

- Keep fish <1 day
-
- Almost all product sold live, or fresh (w/wo ice) but small quantities cooked/grilled
- 4.6 full-time jobs per 100 tonnes sold

Aquaculture VCA – Key Findings

- **Short and simple VC – Producers, Wholesalers, Retailers**
- **No processing or exports – all fish sold fresh or live**
- **Little spoilage**
- **Employment 14 FTEs per 100 tonnes**
 - **Evenly divided between youth and older workers**
 - **Females mainly in retail**
- **Producers receive 72% final consumer price**
- **Production costs = \$US 1300 t⁻¹**
- **Feed accounts for 67% total costs**
- **Operational costs dominate all VC segments**

| | Net profits |
|-----------|-------------|
| Producers | 22% |
| Traders | 3.9% |
| Retailers | 6.8% |

Operational data for the fish farming

| Operational data | Kafr el Sheikh | Behera | Fayoum | Sharkia | Total |
|--|----------------|--------|--------|---------|--------|
| Average area under production (ha) | 11 | 14 | 5 | 16 | 11 |
| Average stocking density /ha | 34,388 | 44,972 | 34,070 | 33,329 | 35,864 |
| Average growth period (months) | 9.6 | 8.7 | 8.3 | 7.7 | 8.7 |
| Average production (tonnes / ha) | 7.76 | 11.46 | 7.53 | 7.42 | 8.46 |
| Average FCR | 1.86 | 1.45 | 1.65 | 1.34 | 1.62 |
| Average size of tilapia when stocking (gr) | 10 | 4 | 11 | 10 | 9.05 |
| Average size tilapia at harvest (gr) | 276 | 235 | 283 | 252 | 265 |
| Tilapia % of stocking rate | 88.5% | 92.6% | 95.4% | 78.7% | 87.1% |
| Average % of total production from tilapia | 86% | 94% | 93% | 79% | 89% |
| Average FTE / ha | 0.50 | 0.54 | 0.91 | 0.54 | 0.63 |
| Average net profit as % of sales | 16% | 20% | 29% | 24% | 22% |

Operational and financial performance data for fish traders/wholesalers

| | Kafr el Sheikh | Behera | Fayoum | Sharkia | Overall |
|--|-------------------|-------------------|------------------|------------------|-------------------|
| <u>Operational data</u> | | | | | |
| Average quantity sold / year (tonne) | 1,598 | 1,292 | 539 | 1,012 | 1,112 |
| Average sales price (LE/kg) | 10.83 | 9.86 | 12.95 | 10.23 | 10.66 |
| <u>Financial performance</u> | | | | | |
| Average operational costs (LE) | 17,158,250 | 12,172,752 | 6,800,911 | 8,226,058 | 11,510,701 |
| Average operational profit (LE) | 499,750 | 404,448 | 404,331 | 397,206 | 420,254 |
| Average operation profit / tonne (LE) | 293 | 265 | 822 | 413 | 440 |
| Average labour costs / tonne (LE) | 42 | 96 | 98 | 91 | 80 |
| Average fixed costs (LE) | 34,454 | 13,517 | 9,532 | 7,918 | 17,377 |
| Average net profit (LE) | 465,296 | 390,931 | 394,799 | 389,288 | 402,877 |
| Average net profit as % of sales | 2.3% | 3.7% | 6.4% | 4.4% | 3.9% |

Operational and financial performance data for fish retailers

| | Kafr el Sheikh | Behera | Fayoum | Sharkia | Overall |
|--|------------------|------------|----------------|------------------|----------------|
| Operational data | | | | | |
| Average annual sales value (LE) | 1,048,860 | n/a | 833,035 | 1,056,600 | 941,593 |
| Average sales price (LE/kg) | 12.51 | n/a | 15.75 | 10.67 | 13.98 |
| Financial performance | | | | | |
| Average operational costs (LE) | 972,648 | n/a | 786,268 | 974,880 | 879,644 |
| Average operational profit (LE) | 76,212 | n/a | 46,767 | 81,720 | 61,948 |
| Average operation profit / tonne (LE) | 916 | n/a | 1,091 | 825 | 996 |
| Average fixed costs (LE) | - | n/a | 5,557 | 4,700 | 3,170 |
| Average net profit (LE) | 76,212 | n/a | 41,210 | 77,020 | 58,778 |
| Average net profit / tonne (LE) | 916 | n/a | 1,008 | 778 | 951 |
| Average net profit as % of sales | 7% | n/a | 6% | 7% | 6.8% |

Employment creation the Egyptian aquaculture value chain

| Employment | Full time equivalent jobs per 100 tonnes.yr ⁻¹ sold | | | | |
|---------------------|--|-------------|--------------|--------------|-----------------|
| | Kafr el Sheikh | Behera | Fayoum | Sharkia | Overall Average |
| farmers | 6.99 | 5.31 | 12.59 | 7.98 | 8.31 |
| traders/wholesalers | 0.40 | 0.62 | 0.92 | 1.56 | 0.87 |
| retailers | 1.34 | n/a | 7.79 | 2.02 | 4.62 |
| Total | 8.73 | 5.93 | 21.29 | 11.57 | 13.80 |

Fish prices across the value chain

| Sub-sector | LE/kg (all species, Average price) | | | | |
|----------------------|------------------------------------|------|-------|-------|-------|
| | K el Sh | Beh | Fay | Sha | All |
| farmers | 9.70 | 8.26 | 11.79 | 9.87 | 9.98 |
| traders/ wholesalers | 10.83 | 9.86 | 12.95 | 10.23 | 10.66 |
| retailers | 12.51 | n/a | 15.75 | 10.67 | 13.98 |

Value-added of farmed fish value-chain

| Sub-sector | LE/tonne | | | | | % total value-added | | | | |
|-------------------------|--------------|--------------|--------------|--------------|--------------|---------------------|-------|-------|-------|-------|
| | K el Sh | Beh | Fay | Sha | All | K el Sh | Beh | Fay | Sha | All |
| farmers | 2,155 | 2,400 | 4,350 | 3,198 | 2,989 | 63.7% | 87.4% | 66.0% | 69.0% | 64.7% |
| traders/ wholesalers | 310 | 347 | 903 | 491 | 503 | 9.2% | 12.6% | 13.7% | 10.6% | 10.9% |
| retailers | 916 | n/a | 1,341 | 948 | 1,131 | 27.1% | n/a | 20.3% | 20.4% | 24.5% |
| Total | 3,381 | 2,748 | 6,594 | 4,637 | 4,623 | | | | | |

Critical factors impacting on value-chain performance

Input critical factors included; access to credit; high cost of fish feed; quality of tilapia fry; water quality of inlet water; limited land available for future expansion; and high cost power and fuel.

Production critical factors included; limited growing season for tilapia; poor farm layout and design; variable knowledge of BMP ; low stocking densities; weak structure of sector organization; and limited number of cultured species (tilapia and mullet).

Post harvest and marketing critical factors : price fluctuations (day and season); poor health and hygiene in wholesale and retail markets; limited experience and knowledge of export markets; lack of value-addition and processing; and steady increases in fish supply coupled with poor consumer perceptions of farmed fish quality leading to declining consumer prices.

Conclusions

The Egyptian aquaculture sector :

generates very considerable levels of value-added,

results in profitable businesses at each stage of the value-chain,

and provides employment for many thousands of people.

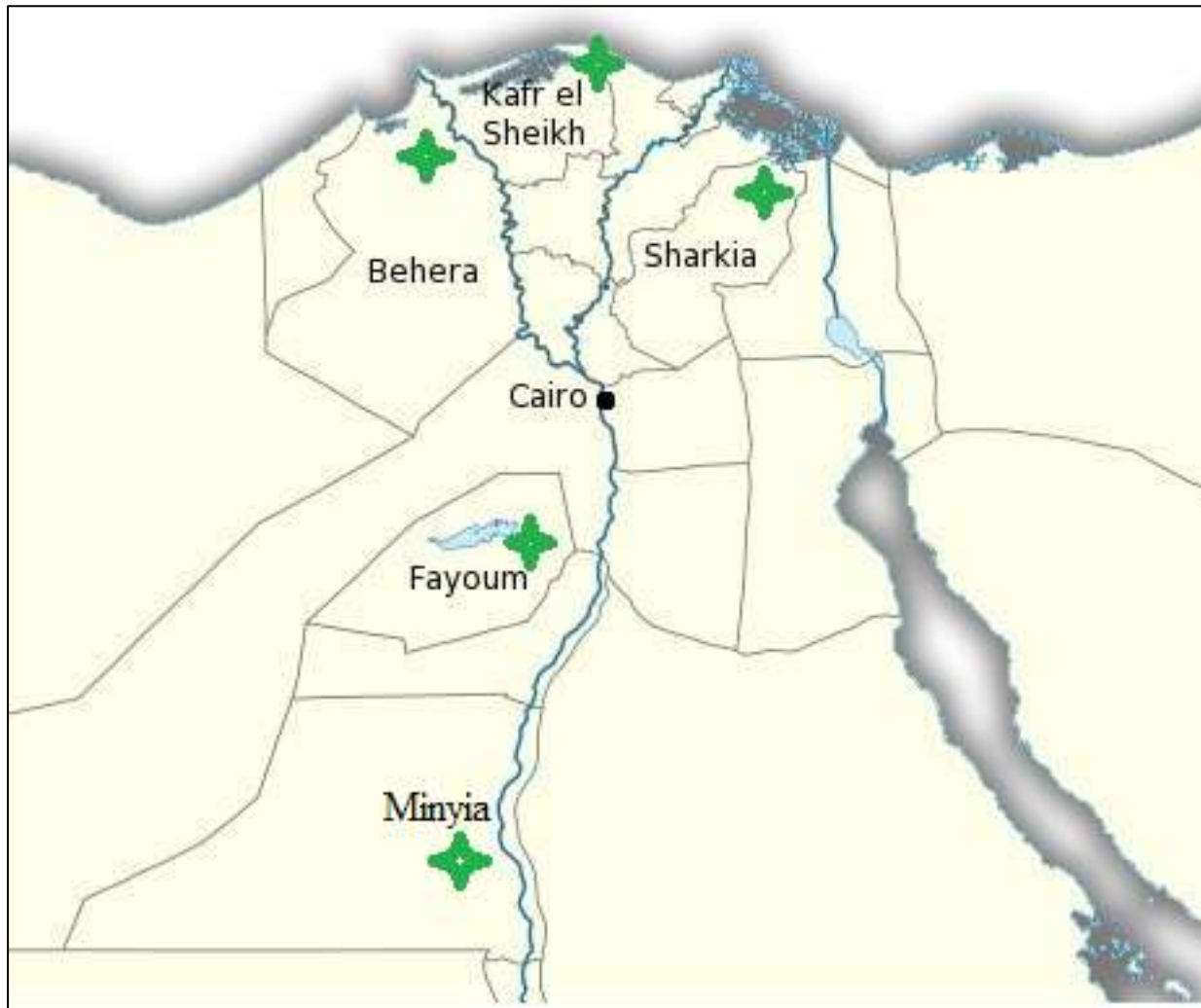
There are opportunities for further improvements in value-chain performance, through :

action by private sector within the value-chain, by NGO`s, and by government.

VC analysis is a useful tool for understanding the social and economic benefits generated by the sector, and for identifying the critical factors affecting its performance.

V C analysis should be considered essential in planning necessary action and innovations for sustainable development of the sector.

Improving Employment and Income through Development of Egypt's Aquaculture Sector (IEIDEAS) Project



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