

# Supplementary Material File S1: Survey

## Section 1: Consent

### Question 1

Do you have an active aquaponics system of more than 1m<sup>3</sup> of water

Please choose only one of the following:

- Yes
- No

### Question 2

I accept that the information on technical, agronomic, sociological and economic data collected during this study will be used for the production of articles and presentations.

Please choose only one of the following:

- Yes
- No

### Question 3

I would like my details to be kept so that I can be informed about the results of the study.

Please choose only one of the following:

- Yes
- No

## Section 2: General Information

### Question 4:

What is your name?

Open Answer

### Question 5:

What is your gender

Please choose only one of the following:

- Man
- Woman
- Other

**Question 6:**

How is your age range?

Please choose only one of the following:

- 18-24
- 25-39
- 40-54
- 55+

**Question 7:**

What is the name of your company/organisation/institution? \*

Please write your answer here:

**Question 8:**

Are you the founder of the organisation/company?

Please choose only one of the following:

- Yes
- No

**Question 9:**

What is your highest level of education?

Please choose only one of the following:

- Less than High School
- High School
- Undergraduate degree
- Master's degree
- Doctorate degree
- Other

**Question 10:**

What is your position in the organization? \*

Please write your answer here:

## Company/Structure

### Question 11:

Please choose all that apply:

- Primary or Secondary School
- Vocational or Trade School or Technical Training Center
- 2-year or 4-year College or University or Graduate School
- Commercial Producer/Farmer (Aquaculture, Horticulture, Aquaponics, Agriculture)
- Vendor
- Research Center/R and D
- Non-profit Organization (eg., after school program, faith-based, international or social aid, workforce training etc..)
- Consulting agency/Consultant
- Other:

### Question 12:

Your organisation has the following types of production methods \*

Please choose all that apply:

- RAS/Aquaculture
- Hydroponics
- Outdoor vegetable growing (in soil)
- Insects
- Mushrooms
- Other

### Question 13:

The organisation you work for offers the following

Please choose all that apply:

- Products
- Services

- Research
- Other:

**Question 14:**

What are the main purposes of your activities? \*

	No importance	Little importance	Certain importance	High importance	I can't say
Please choose the appropriate response for each item:	<input type="radio"/>				
Commercial/Financial gain	<input type="radio"/>				
Self-consumption/Local consumption	<input type="radio"/>				
Subsistence (production for food security)	<input type="radio"/>				
Educational/Training	<input type="radio"/>				
Environmental sustainability/Area Management	<input type="radio"/>				
Social integration	<input type="radio"/>				
Leisure/Well-being	<input type="radio"/>				
Customary use of land (tradition/expression of culture)	<input type="radio"/>				
Research and Development	<input type="radio"/>				
Improving the nutritional and gustative quality of food	<input type="radio"/>				
Innovative food production systems (Technology)	<input type="radio"/>				

**Products and Services**

**Question 15:**

In the past 12 months you have

Please choose all that apply:

- sold aquaponic raised fish or crops
- sold aquaponic-related materials, services or information (eg. Consulting)
- trained people about aquaponics (eg., classes, workshops, visits)
- rented space for non-aquaponic related events
- Not generated profit with your aquaponic system

#### **Question 16:**

Does your organisation currently have an active aquaponic system with more than 1m<sup>3</sup> of water? \*

Please choose only one of the following:

- Yes
- No

## **Production Methods**

This section gather general information on the aquaponic facility.

#### **Question 17:**

Where is your aquaponic system located? \*

Please choose only one of the following:

- Rural
- Peri-urban
- Urban

#### **Question 18:**

In what year did you start your aquaponic system? \*

Please write your answer here:

#### **Question 19:**

Who designed your aquaponics system? \*

Please choose only one of the following:

- Self-designed
- Purchased as Kit

- Designed by consultants (please name the consulting company if possible)

Make a comment on your choice here:

### Question 20:

Estimate the size of your aquaponics system (m<sup>2</sup>)

Please write your answer here:

### Question 21:

Is your system coupled or decoupled? \*

Please choose only one of the following:

- Coupled (1 loop)
- Decoupled (2 or more loops)
- Partially decoupled (changes throughout the year)
- Other

### Question 22:

Where do you source your water?

Please choose all that apply:

- Rain water
- well water
- City/Municipal water
- Other:

## Recirculating Aquaculture System (RAS)

### Question 23:

Where is your RAS housed?

Please choose all that apply:

- Inside a building
- Inside a ground-level cold greenhouse or high tunnel
- Inside a ground-level heated greenhouse
- On a rooftop or terrace

- In a rooftop cold greenhouse
- In a rooftop heated greenhouse
- Outside (detached from building)
- Other:

**Question 24:**

What type(s) of biological filter(s) do you use? \*

Please choose all that apply:

- Moving bed bioreactor (Biomedia)
- Media bed as biofilter (eg. clay balls)
- Bead filter
- Sand filter
- Other:

**Question 25:**

What type(s) of mechanical filter(s) do you use?

Please choose all that apply:

- Clarifier/Radial flow filter/Swirl separator (sedimentation)
- Drum filter
- Bead filter
- Sand filter
- Media beds
- No filters
- Other:

**Question 26:**

Does your system have a biofloc unit? \*

Please choose only one of the following:

- Yes
- No

**Question 27:**

Does your system use a UV filter?

Please choose only one of the following:

- Yes
- No

**Question 28:**

Does your system use pure oxygen? \*

Please choose only one of the following:

- Yes
- No

**Question 29:**

What type(s) of fish feed were used in the last 12 months? \*

Please choose all that apply:

- Feed pellets (containing animal proteins/fats)
- Feed pellets (containing insect proteins)
- Feed pellets (100% vegetarian)
- Aquatic plants (eg. duckweed, azolla)
- Live feed (insect larvae, daphnia etc)
- Food scraps
- Biofloc
- Other:

**Question 30:**

What specie(s) of fish/crustaceans have been raised in your aquaponic system in the last 12 months? \*

Please choose all that apply:

- Tilapia
- Trout
- Perch
- Ornamental fish (koi, goldfish etc)
- Bass (Stripped bass or other)

- Catfish
- Salmon
- Shrimp
- Crayfish
- Pike-perch
- Carpe
- Artic Char
- Other:

### Question 31:

Please estimate your fish harvest in the last 12 months?

Please choose only one of the following:

- 1 - 49 kg
- 50 - 99 kg
- 100 - 499 kg
- 500 - 999 kg
- 1000 - 4999 kg
- 5000 - 9999 kg
- 10,000 - 19,999 kg
- 20,000 kg +

## Hydroponics

### Question 32:

Which of the following production systems were used in the last 12 months? \*

Please choose all that apply:

- Rafts (planting in floating trays)
- Media beds (gravel or other media filled boxes)
- Substrate culture with drip system (Dutch buckets/growbags)
- Nutrient Film Technique (horizontal irrigated trays or gutter planters)
- Vertical towers (vertically irrigated pipe planters)
- Wicking beds

- Other:

**Question 33:**

Where is your hydroponic system housed? \*

Please choose all that apply:

- Inside a building
- Inside a ground-level cold greenhouse or high tunnel
- Inside a ground-level heated greenhouse
- On a rooftop or terrace
- Inside a rooftop cold greenhouse
- Inside a rooftop heated greenhouse
- Outdoors (detached from building)
- Other:

**Question 34:**

What types of crops were grown in your aquaponic system in the last 12 months? \*

Please choose all that apply:

- Aromatic herbs
- Lettuce
- Salad greens
- Collard greens/Cabbage
- Tomatoes
- Cucumbers
- Aubergines/Eggplants
- Courgettes/Zuchinis
- Peppers
- Strawberries
- Microgreens
- Bok Choi
- Gourds and Melons
- Okra
- Kale

- Squash
- Watercress
- Beets
- Carrots
- Onions
- Cut flowers
- Ornamental plants
- Taro
- Other fruits
- Corn
- Other rooting crops
- Duckweed
- Leeks
- Celery
- Chard
- Broccoli
- Beans and Peas
- Other:

**Question 35:**

Do you use artificial lighting? \*

Please choose only one of the following:

- Yes
- No

**Question 36:**

Please estimate your crop harvest in your aquaponics system in the last 12 months? \*

Please choose only one of the following:

- 1 - 49 kg
- 50 - 99 kg
- 100 - 499 kg
- 500 - 999 kg

- 1000 - 4999 kg
- 5000 - 9999 kg
- 10,000 - 19,999 kg
- 20,000 kg +
- Other

## Fish Sludge Treatment

### Question 37:

Where is your fish sludge treated? \*

Please choose all that apply:

- Public sewage treatment plant
- On-site private sewage treatment (self treated)
- Off-site private sewage treatment by an external company
- Not treated
- Other:

### Question 38:

What is your sludge treatment? \*

Please choose all that apply:

- Aerobic mineralisation
- Anaerobic mineralisation
- Biomethanisation
- Vermicomposting
- I don't know
- Other:

### Question 39:

How is your fish sludge utilized? \*

Please choose all that apply:

- Not utilized
- Used for soil agriculture

- Reused in the hydroponic section
- I don't know
- Other:

## Monitoring and Control

### Question 40:

Do you use a monitoring system? \*

Please choose only one of the following:

- No
- Yes, only for fish
- Yes, only for plants
- Yes, one for fish and one for plants (2 systems)
- Yes, one for fish and plants (1 system)

## Business

### Question 41 :

What are the three main challenges your projet/company is facing right now? \*

### Question 42:

What are the reasons behind the launch of your project/company?

	No importance	Low importance	Certain importance	High importance	I can't say
Be my own boss	<input type="radio"/>				
Develop a complementary professional activity	<input type="radio"/>				
Develop a full time professional activity	<input type="radio"/>				
Reduce costs (eg. taxes)	<input type="radio"/>				
Reduce CO2 emissions	<input type="radio"/>				
Have a green image	<input type="radio"/>				
Social cohesion/integration	<input type="radio"/>				
Education/Training	<input type="radio"/>				

Academic research	<input type="radio"/>				
To produce food	<input type="radio"/>				
To produce my own food	<input type="radio"/>				
By passion/as a hobby	<input type="radio"/>				

**Question 43:**

What are your 3 biggest success factors? \*

**Question 44:**

Please grade the support/engagement offered by the following stakeholders;

	Not engaged/No support	Small engagement/Little support	Certain engagement/support	High engagement/support	Essential engagement/support
Neighbours	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Schools	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Restaurants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NGO's or associations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Supermarkets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Markets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Grower	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Question 45:**

Have you benefited from the support of other stakeholders?

Please write your answer here:

**Question 46:**

Do you have any competitors? \*

Please choose only one of the following:

- Yes
- No

Make a comment on your choice here:

### Question 47:

If Answer was 'Yes' at question "Do you have any competitors?", please choose the appropriate response for each item:

	No competitio n	Small competitio n	Certain competitio n	High competitio n	Very high competitio n
Supermarket	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Local shops	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Markets (outdoors)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Grower (industrial)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Grower (artisanal)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Restaurants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Research centres	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Question 48:

Do you have clients/customers? \*

Please choose only one of the following:

- Yes
- No

### Question 49:

My business/project does; \*

Comment only when you choose an answer.

Please choose all that apply and provide the percentage of income from this activity

- Business to Business (B2B), proportion: \_\_\_\_\_%
- Business to Client (B2C), proportion: \_\_\_\_\_%
- Research, comment: proportion: \_\_\_\_\_%
- Other:

### Question 50:

If answer was 'Yes' at question "Do you have clients/customers?", Who do you identify as your main customers and what are their expectations?

Write your answer here: \_\_\_\_\_

### Question 51:

If answer answer was 'Yes' at question "Do you have clients/customers?", the expectations of my customers are:

	No importance	Small importance	Certain importance	High importance	Essential importance
Local food	<input type="radio"/>				
Fresh / Seasonal food	<input type="radio"/>				
Education/information	<input type="radio"/>				
Organic products	<input type="radio"/>				
Knowing the origin of the produce	<input type="radio"/>				
Having a farming/agricultural experience	<input type="radio"/>				
Scientific reports	<input type="radio"/>				

### Question 52:

If answer answer was 'Yes' at question "Do you have clients/customers?", my modes of communication with my clients are; \*

	No importance	Small importance	Certain importance	High importance	Essential importance
Direct "face to face"	<input type="radio"/>				
Word of mouth	<input type="radio"/>				
Facebook	<input type="radio"/>				
LinkedIn	<input type="radio"/>				
Tweeter	<input type="radio"/>				
Instagram	<input type="radio"/>				
Email/newsletter	<input type="radio"/>				
Website	<input type="radio"/>				
Press/Journal/TV	<input type="radio"/>				

### Question 53:

What were the initial investments of your company/organisation? \*

Please choose only one of the following:

- less than 10 000 €
- 10 000 - 50 000 €
- 50 000 - 100 000 €
- 100 000 - 500 000 €
- 500 000 - 1 000 000 €
- more than 1 000 000 €
- I don't know

#### Question 54:

What were the costs for the functioning of the aquaponic system in the last 12 months?

Please write your answer here: \_\_\_\_\_ €

#### Question 55:

Annual incomes of the last 12 months?

	0-5%	5-10%	10-30%	30-50%	50-70%	70-90%	90-100%	N/A
Plants/Fruits/Vegetables/Micro-greens	<input type="radio"/>							
Fish	<input type="radio"/>							
Mushrooms/Insects/other meats/dairy products	<input type="radio"/>							
Events (visits, workshops etc)	<input type="radio"/>							
Education (training, classes etc)	<input type="radio"/>							
Research	<input type="radio"/>							

#### Question 56:

Did your company/project make profit last year?

Please choose only one of the following:

- Yes
- No

#### Question 57:

What was the average profit margin on the products you sold in the last 12 months?

Please choose only one of the following:

- 0-10%
- 10-20%
- 20-30%
- 30-40%
- 40-50%
- 50-60%
- 60-70%
- 70-80%
- 80-90%
- I don't know

**Question 58:**

Did you receive public funding in the last 12 months?

Please choose only one of the following:

- Yes
- No

**Question 59:**

Can you indicate what you have done to improve profits in the last 12 months?

Please write your answer here: \_\_\_\_\_

**Question 60:**

Which areas do you plan to invest in most in the next 12 months?

Please write your answer here: \_\_\_\_\_

**Question 61:**

Please indicate the amount of staff required to run the project/organisation; \*

0	< 0.25	0.25 - 1	2 - 5	6 - 10	> 10
	/year	/year	/year	/year	/year

Number of full time jobs per year  
with salary

Number of full time jobs per year  
without salary (interns,  
volunteers)

**Question 62:**

Can you write a few comments on the biggest challenges/success factors in finding and keeping qualified and educated personnel?

Please write your answer here: \_\_\_\_\_