KLEINSKUUR

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AquaPonics

Systems Catalogue

Content page

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How thirsty is your food?

	CONVENTIONAL		AQUAPONICS	
	One head of broccoli	20,4 ℓ	One head of broccoli	1 ℓ
	One head of cabbage	13,2 ℓ	One head of cabbage	0,7 ℓ
	One tomato	12,5 ℓ	One tomato	0,6 ℓ
	One strawberry	1,5 ℓ	One strawberry	0,075 ℓ

Use 95% less water than conventional farming

What is aquaponics?

Aquaculture
(fish production)

Hydroponics
(plant production)

Bacteria convert fish waste (nutrient production)

Advantages of aquaponics

- 95% less water
- No water goes to waste
- More production – less land
- Build on non-arable land
- Urban sites possible
- Provide work to local people
- Fish is source of income and protein
- Harvest vegetables daily
- Grow huge variety at the same time
- Healthy food, completely natural

Why the Kleinskuur system?

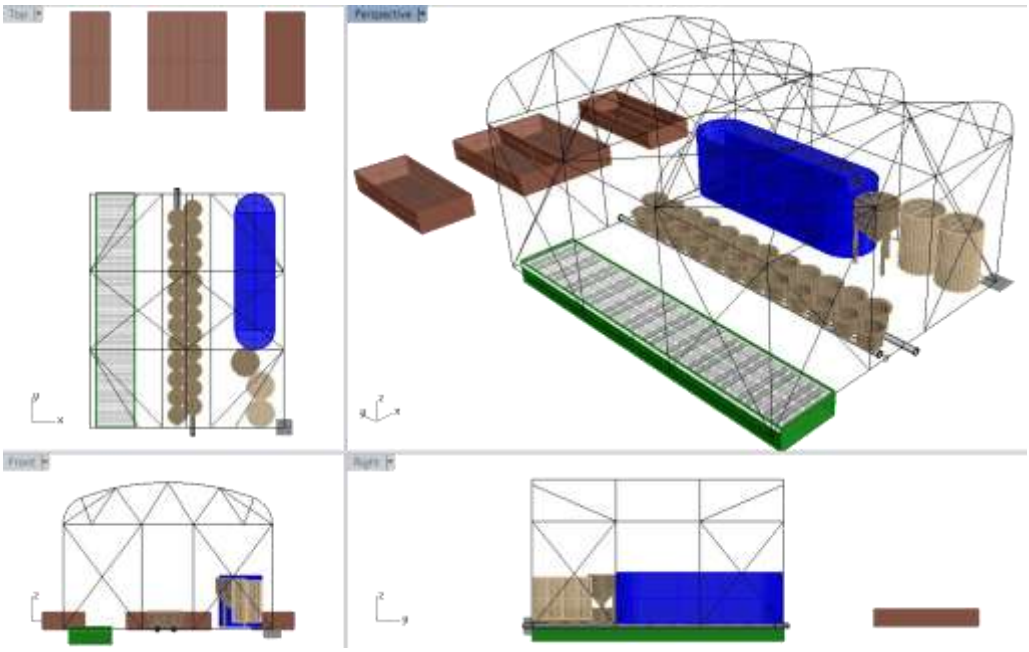
- A proven, working system
- 84% effective use of the space in the greenhouse
- Ergonomic and efficient design
- Less hard labour, more skills transfer
- Working with nature
- Robust with low maintenance
- It can be established anywhere in the world

"Kleinskuur runs aquaponics farms, provides training and sells aquaponic systems modified for the continent. The systems use solar energy to pump water for use in a soil-less growing system.

"This minimizes land and water demand (90% less) and increases resilience to climate change. For large farms, every 6 square meters employs one person."

World Economic Forum, *Five Big Bets for the Circular Economy in Africa*, p 15

KSBA24 Family System



Production:	Total in system	Harvest per month	Harvest per year
Nile Tilapia	600 fish	45 kg	540 kg
Gravel Barrels (Tomato as sample)	24 barrels	96 kg	1 152 kg
Deep Water Culture (Lettuce as sample)	180 holes	180 heads	2 160 heads

This family system is uniquely designed for use to feed 6 to 8 people. It is easy to install and operate. This system was not designed for commercial purposes, but just in terms on savings by not having to buy all the vegetables and fish, the system can pay for itself in less than a year. It is also often used as a pilot project to get to understand aquaponics before venturing into large-scale production.

KSBA24

Ideal for:

Homes, hobbies, businesses to provide food for workers, training and educational purposes.

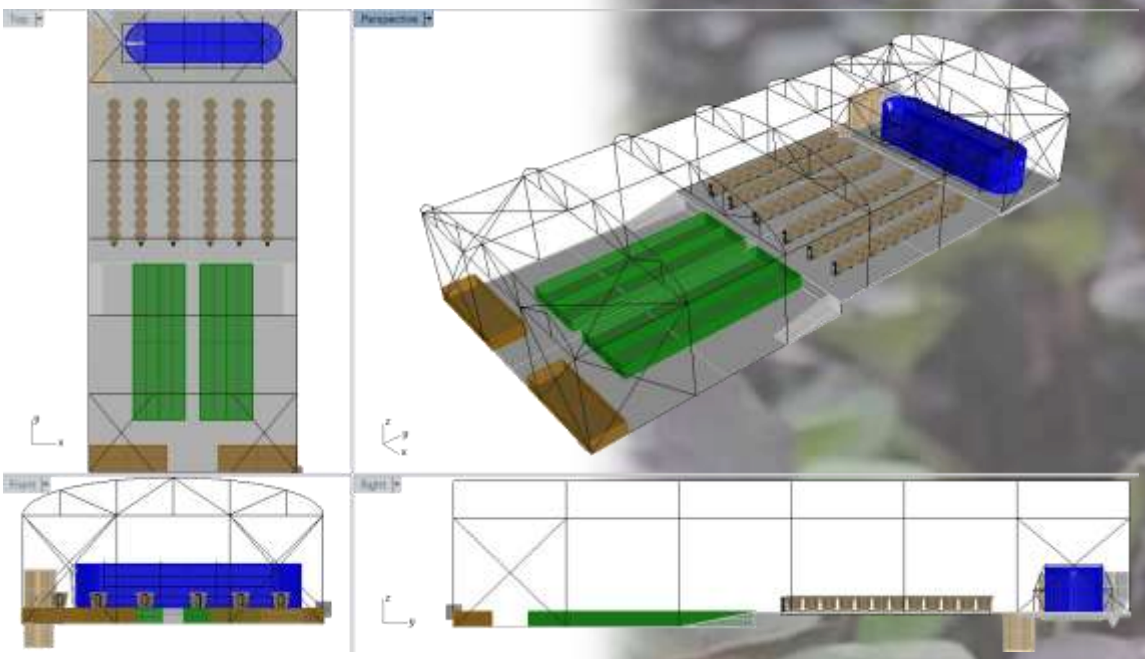
Quick facts:

Size:	6 m X 5 m
Total water in system:	7 600 litres
Daily water use:	20 litres
Fish feed:	16 kg/month
Power use:	4 kW max (+ inline heater)

Capital cost: (VAT Excl.) *

Complete system:	USD 4 000 (No optionals)
With optionals included in total:	
PLUS 1 wicking bed	USD 4 100, and
PLUS Starter pack	USD 4 400 and
PLUS Tunnel & installation	USD 7 000

KSBA72 Lodge & Training System



Production:	Total in system	Harvest per month	Harvest per year
Nile Tilapia	1 200 fish	80 kg	960 kg
Gravel Barrels (Tomato as example)	72 barrels	288 kg	3 456 kg
Deep Water Culture (Lettuce as example)	924 holes	924 heads	11 088 heads

The system was developed for educational institutions. The size makes it easy to manage but big enough for all the students to have hands-on experience with plants and fish. Kleinskuur Aquaponics has a complete manual available to enable the practical teaching of aquaponics. The students can gain the following:

Natural sciences: Understanding the dynamics of an ecosystem and working with plants and fish.

Physics: Understand the working of the system, waterflow, and the role of the different components.

Management skills: Planning ahead by creating planting schedules, taking responsibility for tasks, keeping record of everything, managing input costs.

Creative skills: Developing a brand.

Marketing skills: Packaging and selling the produce out of the system.

KSBA72

Ideal for:

Community, NGO, school, farm, lodge or hostel projects for food supply.

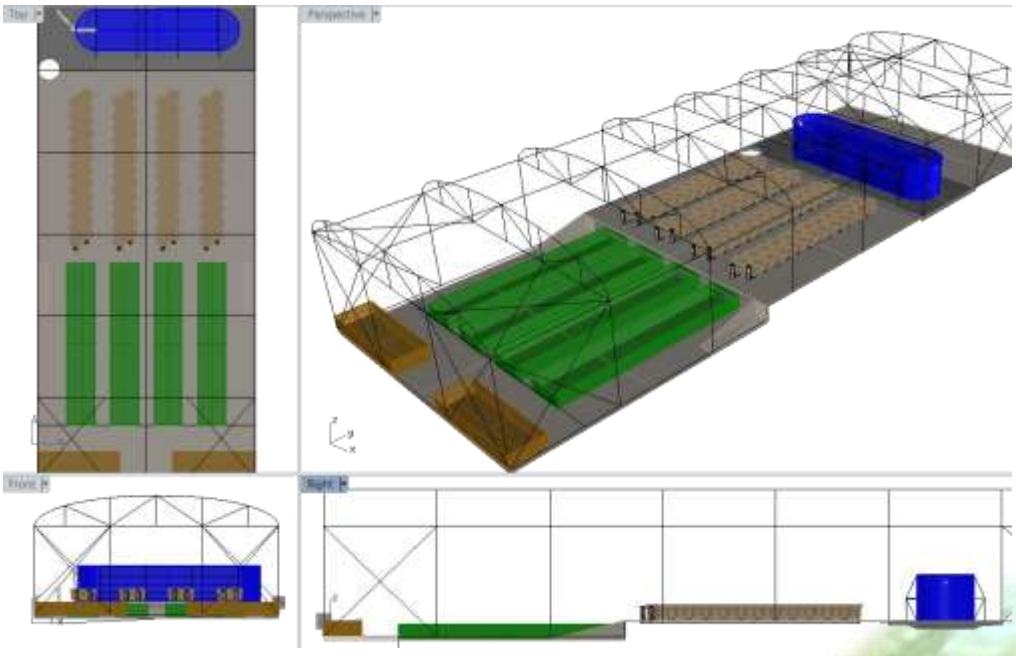
Quick facts:

Size:	18 m X 8 m
Total water in system:	25 000 litres
Daily water use:	50 – 100 litres
Fish feed:	38 kg/month
Power use:	4 kW max (+ inline heater)

Capital cost: (VAT Excl.) *

Complete system:	USD 11 000 (No optionals)
With optionals included in total:	
PLUS 1 wicking bed	USD 11 400
PLUS Starter pack	USD 12 000
PLUS Tunnel & installation	USD 21 000

KSBA96 Light Community System



Production:	Total in system	Harvest per month	Harvest per year
Nile Tilapia	1 800 fish	120 kg	1 440 kg
Gravel Barrels (Tomato as sample)	96 barrels	384 kg	4 608 kg
Deep Water Culture (Lettuce as sample)	924 holes	924 heads	11 088 heads

The 96-barrel system is ideal for farms, hotels, conference centres, and other centres where a variety of fresh food is needed daily. In combination with wicking beds a full range of crops can be produced. All the leafy types of greens and herbs find a home in the deep water culture, the fruiting crops, such as tomatoes, peppers, brinjals, cucumbers, melons, berries, and green beans thrive in the gravel barrels, and rooting crops, including onions, beetroot, sweet potatoes, and garlic sprout their spoils in the rich composted soil of the wicking beds.

With additions, such as breeding tanks and incubators the KSBA96 can also be converted into a hatchery for the production of fingerlings.

It is also ideal for training centres.

KSBA96

Ideal for:

Community, NGO, school, farm, lodge or hostel projects for food supply.

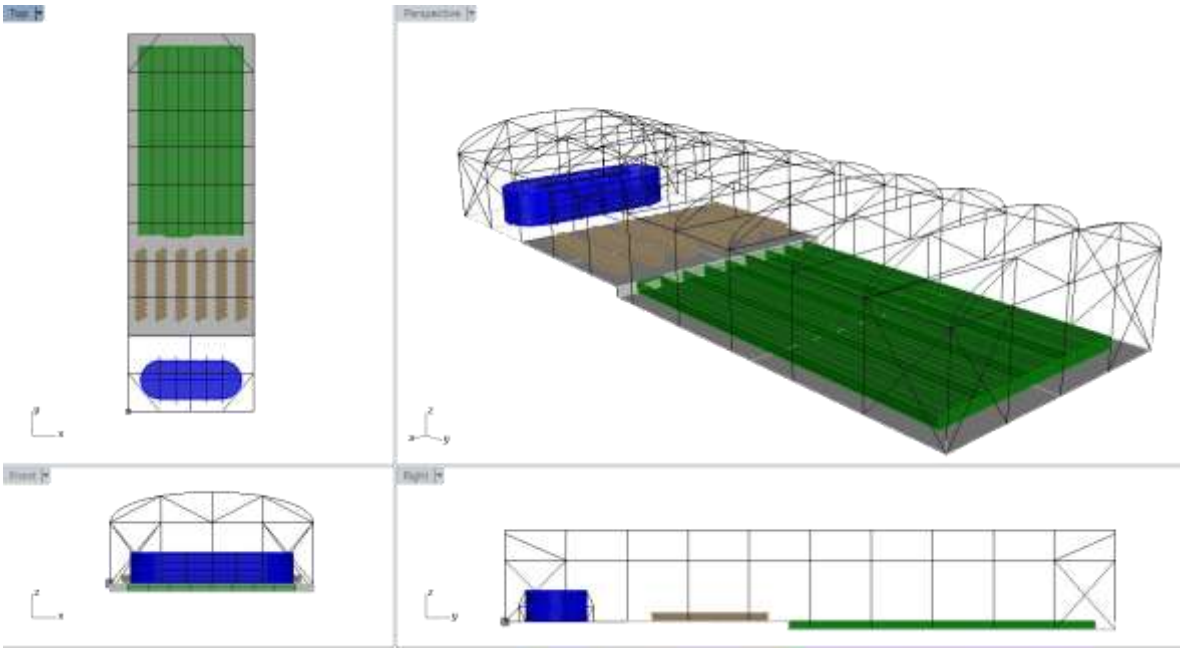
Quick facts:

Size:	18 m X 8 m
Total water in system:	30 560 litres
Daily water use:	50 – 100 litres
Fish feed:	41 kg/month
Power use:	4 kW max (+ inline heater)

Capital cost: (VAT Excl.) *

Complete system:	USD 13 000 (No optionals)
With optionals included in total:	
PLUS 1 wicking bed	USD 13 400
PLUS Starter pack	USD 14 500
PLUS Tunnel & installation	USD 22 000

KSBA150 Community System



Production:	Total in system	Harvest per month	Harvest per year
Nile Tilapia	3 000 fish	200 kg	2 400 kg
Gravel Barrels (Tomato as sample)	156 barrels	624 kg	7 488 kg
Deep Water Culture (Lettuce as sample)	5 000 holes	5 000 heads	60 000 plants

The KSBA150 was developed to empower communities and NGO projects to be self-sufficient in terms of vegetable and fish production.

It fits in a standard 10 X 30 metre greenhouse tunnel and can produce healthy, tasty food right through the year. It can feed more than a hundred people.

In terms of income, it can sustain a family if everyone does his or her part of the work and makes an effort to sell the produce directly to the public or to restaurants and venues in the area.

It can also be used to cultivate specialised produce or unique lines of herbs that can be exported at lucrative prices.

KSBA150

Ideal for:

Community, NGO, school, or hostel projects. Speciality products for commercial purposes.

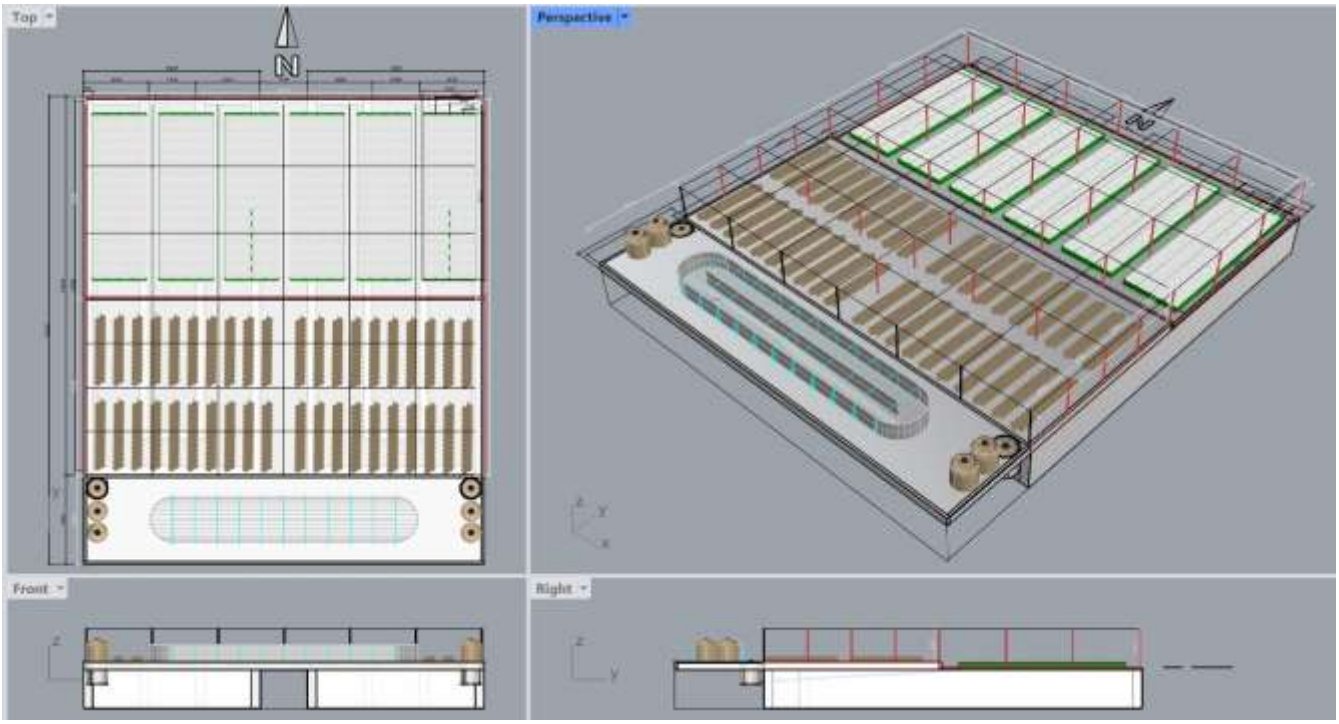
Quick facts:

Size:	30 m X 10 m
Total water in system:	90 000 litres
Daily water use:	150 – 200 litres
Fish feed:	90 kg/month
Power use:	4,3 kW max (+geothermal)

Capital: (VAT Excl.) *

Complete system:	USD 32 000 (No optionals)
With tunnel:	USD 42 000
Cost to run:	USD11 000 / year
Potential income	USD 20 000 / year

KSBA1000 Commercial System



Production:	Total in system	Harvest per month	Harvest per year
Nile Tilapia	24 500 fish	1 225 kg	14 700 kg
Gravel Barrels (Tomato as sample)	1 040 barrels	4 160 kg	49 920 kg
Deep Water Culture (Lettuce as sample)	18 600 holes	18 600 heads	223 200 plants

The KSBA1000 forms the modular base unit of all the KSBA commercial systems and in itself will provide a proper income to build a business. It can be used as the first phase in a larger commercial project.

A wide variety of crops can be planted, or one can focus on one or two lines of produce in every section to reach an economy of scale providing stock for packhouses and the retail sector.

On this scale it becomes important to do a proper business plan, with which KSBA can assist at a very affordable price. Next to the KSBA1000 a basic packhouse with cool rooms to process the fish and vegetables becomes essential.

Producing commercially and for export means that GlobalG.A.P. certification is needed. KSBA can also assist with all the requirements needed for this certification.

KSBA1000

Ideal for:

Commercial production or first phase of a full commercial project

Quick facts:

Size:	36 m X 42 m
Total water in system:	320 000 litres
Daily water use:	1 250 litres
Fish feed:	611 kg/month
Power use:	10 kW (+ geothermal)

Capital: (VAT Excl.) *

Complete system:	USD 130 000 (No optionals)
With tunnel:	USD 150 000
Cost to run:	USD 78 000 / year
Potential income	USD 109 000 / year

KSBA4000 Commercial Combo

Production:	Total in system	Harvest per month	Harvest per year
Nile Tilapia	98 000 fish	4 900 kg	58 800 kg
Gravel Barrels (Tomato as sample)	4 160 barrels	16 640 kg	199 680 kg
Deep Water Culture (Lettuce as sample)	74 400 holes	74 400 heads	892 800 plants

This fully fledged commercial unit has been developed to provide a return on investment in 22 months by selling all the produce from the system.
It can be constructed as one unit or by linking four KSBA1000 units over time.
To ensure food security in a region with minimal land and water use, multiple KSBA4000 units can be built in a cluster to form the core of development of a huge project.
At this scale it makes sense to also provide some of the raw material used to produce fish food and incorporate value adds by converting waste such as fish scale into a sought-after health product called collagen.
Other fish and leafy waste can be used in a black soldier fly facility to produce protein-rich larvae.
Compost made from discarded leaves and roots can also be used to build up the soil around the cluster for organic farming of grains or any tree crops, such as nuts and fruits.
Packaging facilities will be essential and processing of the produce can ensure added value.
A proper business plan can incorporate all these facets.

KSBA4000

Ideal for:

Full commercial project or as part of a cluster of commercial systems

Quick facts:

Size:	144 m X 42 m
Total water in system:	1 280 000 litres
Daily water use:	5 000 litres
Fish feed:	2 444 kg/month
Power use:	40 kW (+ geothermal)

Capital: (VAT Excl.)*

Complete system:	USD 520 000
With greenhouse:	USD 600 000
Cost to run:	USD 312 000 / year
Potential income	USD 436 000 / year

*What is included?

Included:

- Fish section with filtering, mineralisation, and nitrification system
- Gravel Barrels section for fruiting crops, such as tomato, pepper, cucumber, and brinjal
- Deep Water Culture section for leafy vegetables, such as lettuce, spinach, kale, and herbs
- Electrical equipment, pipes and fittings

Optional:

- Wicking beds for root crops, e.g. carrot, onion, potato
- Starter pack with seed, grow medium, seedling trays, biological pest control, nutrients, fish, fish feed.
- Tunnel/net house with net/ plastic covering
- Training and support package

Excluded:

- Gravel for Gravel Barrels
- Paving or bricks for pathways and cement slabs for flooring
- Terrain preparation
- Transport of system, travel and accommodation costs for construction team
- Labour on site to assist with construction

Expertise and services

Colin Bremner completed courses presented by world-renowned aquaponics experts, Murray Hallam and Dr. James Rakocy. Kleinskuur Boerdery Aquaponics was established soon after and has grown from an R&D system into a recognized and reliable supplier in the industry. Colin's wife Annemarie has recently joined Kleinskuur full time, to assist in rolling out Kleinskuur Aquaponic systems for sustainable food production. KSBA provides training, mentorship, custom designs, consulting services, and tested systems in all sizes using the unique KSBA Gravel Barrel Auto Syphon design. KSBA also has an experienced installation team and provide on-site training as well as all you need to get your system up and running.