Feasibility study on establishing a Horticultural Knowledge Center in Uzbekistan

Results and actions for next stage

Marc Ruijs and Irina Verweij-Novikova Wageningen Economic Research





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Introduction

Objectives:

- Concept of Horticultural Knowledge Center (outline)
- Estimation of necessary investments
- Identify next steps on the way to a feasible center

Starting points

- World Horti Center Westland: model for Uzbekistan?
- From inspiration to proposal







Results

Concept of HKC (Horticultural Knowledge Center)



Tashkent City Demo/Garden center 0.5 ha PRODUCTION FACILITY

In 5-10 km Greenhouse plastic 1 ha Greenhouse Venlo 1 ha







Production and demo facility (1)

Why production facility?

- Open for training. No commercial greenhouses are open to trainings (avoiding risk factor)
- Large greenhouse compartments are required (to train practical skills). Trainings in demo / research compartments is limited.
- Focused on revenues.

Why production facility of 2 types?

- Plastic: more familiar in Uzbekistan (98% are plastic covered greenhouses; 95% are grown in soil). To make switch from soil to substrate and from plastic to glasshouse
- Venlo Glass Greenhouse: to meet future demand and trend towards high-tech globally. Proof of concept. Energy-saving solutions are possible.
- Possibility to compare plastic and glasshouse.





Production and demo facility (2)

Why Demo/Garden facility in the city?

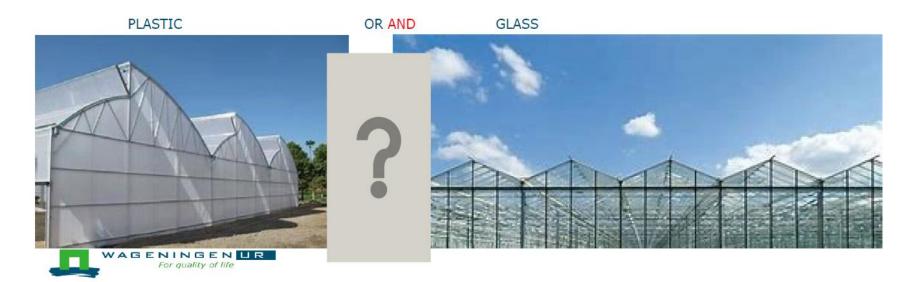
- Open to general public. Easy access by public transport.
- Multiple functionality like flower shop, shop of own produce, laboratory for nutrient analysis.
- Meeting place.
- Show case.



Assessment of investments – approach (1)

Tashkent region PRODUCTION facility 2 ha

- Commercial greenhouse production open to trainings (2 ha)
 - Production and sale of produce
 - Work is done by permanent staff
 - Work is done by students / trainees (lower yields allowed)





Assessment of investments – approach (2)

Tashkent Demo/Garden center 0.5 ha

- 1/6 of area of the Worl Horti Center in Naaldwijk
- 4 x 200 m2 compartments for research projects (e.g.cucumber, tomato, sweet peppers, indoor greens)
- Shop area selling own produce (vegetables)
- Meeting place for investors & Consultations
- Project office "Horticultural projects"
- Classroom (with computers)
- Journal office "Horticulture and Greenhouses of Uzbekistan" and web-site team
- Potential hosting for head quarters "Greenhouse Association of Uzbekistan"
- Office Agro-portal (and App)
- Laboratory for sampling the irrigation water, nutrient analysis
- Events area





Assumptions for Production facility

	Plastic multitunnel	Glasshouse (Venlo)
greenhouse type	multitunnel	Venlo type
	1.0 ha	1.0 ha
insect nets	no insect nets	yes
screen: energy	no screen	yes
CO2 application	no CO2	yes
fogging system	no fogging	yes
recirculation drainwater	no water circulation	yes
heating: gasboiler	yes	yes
cocospeat slabs in gutter	yes	yes
drip irrigation and fertigation	yes	yes
rainwater bassin	yes	yes
crop protection techniques	yes	yes
railpipes	yes	yes
sorting and packaging	on location	on location
purification of drainwater	no	no
heat storage	no	no
lighting	no	no
ventilation	butterfly	continues ridge



Experiences World Horti Center Westland

- Development process:
 - Development period from idea to realization: 7 years
 - Construction period: 10 months
 - Development costs EUR ____ mio (> EUR 25 mio)
- Total investment of WHC is roughly EUR mio:
 - School: EUR mio (43%) (financed by state (cheap))
 - Permanent trade fair: EUR mio (29%) (financed by bank, bond financing and intrest fee loan from municipality for 5 years)
 - Research Facility: EUR mio (29%) (financed by equity + bank)

The concept requires a very intensive management and will only result in a (small) operational profit by 100% occupancy



Investments – comparison of options

	units	low-tech greenhouse	mid-tech greenhouse	high-tech greenhouse, no lighting	High Tech Research
Investment	euro / m2	5-10	30-50	80-100	1000
Operational costs Electricity use	euro / m2 kWh / m2 /	2-5	10-25*	12-45 5-10	200 50
Yield tomato fresh (beef, tross)	year kg / m2 / year	10-20	25-40	60-75	90



Remarks

- Yield increases as technology level increases
- Investments and related costs for high-tech production are clearly higher than for mid-tech and low-tech, but will also lead to higher revenues and probably to higher net financial results
- Adapted (higher) knowledge level is a condition for realizing in the possibilities of high-tech production and largely determines profitability
- The potential of innovative cover materials (to achieve a higher light transmission and/or energy savings) largely depends on the difference between extra revenues and extra costs and therefore determines the investment capacity



Training on practical skills for greenhouse cultivation

• Workers/labour

- Compartments of at least 2000 m2 to offer trainings
- Twisting, Pruning, clipping, lowering, deleafing, harvesting
- Agronomic management (needs to be able to link the skills in one person):
 - Crop protection
 - Greenhouse climate control
 - Fertigation
 - Crop planning and management
 - Post-harvest
- Glasshouse Business Development (e.g. Investment Tool Software)
- Research trials



Investment scenarios Dimension of demo and glasshouse facility

Scenario 1: Payback Plastic 1 ha : 7-8 years Venlo 1 ha: 6-7 years Demo: not profitable

Scenario 2: Payback Plastic 1 ha : 7-8 years Venlo 4 ha: 5 years Demo: not profitable

		Estimated investment
		alternative (more expensive
	Estimated investme	nt Demo)
0.5 ha Demo Tashkent City	€ 3,686,0	00 € 6,286,000
1 ha plastic tomato crop hydroponics	€ 586,8	00 € 586,800
1 ha greenhouse Venlo tomato	€ 1,613,4	50 € 1,613,450
Research & Development (incl.		
training, agronomic supervision)	€ 2,000,0	00 € 2,000,000
Total	€ 7,886,2	50 € 10,486,250
0.5 ha Demo Tashkent City	€ 3,686,0	00 € 6,286,000
1 ha plastic tomato crop hydroponics	€ 586,8	00 € 586,800
4 ha greenhouse Venlo tomato	€ 5,069,4	00 € 5,069,400
Research & Development (incl.		
training, agronomic supervision)	€ 2,000,0	00 € 2,000,000
Total	€ 11,342,2	00 € 13,942,200

Demo component : is the most unknown and requires more research



Alternative for plastic greenhouse (Uzbek example)

3 different compartments in Plastic greenhouse to account for local conditions:

- 3000 m2 GROWING IN SOIL NO heating, august mid December, harvesting 6 weeks (6 kg / m2)
- 3000 m2 GROWING IN SOIL WITH heating, august mid December, harvesting 10 weeks (10 kg / m2)
- 3000 m3 GROWING OUT OF SOIL, WITH HEATING, NL technology analogy example " Chirchik" (25 kg / m2)
- Slight increase in total investment expected



Next steps

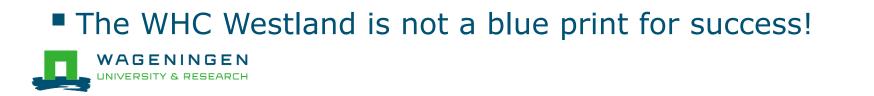
Is the concept acceptable? Fit it to the Uzbekistan situation?

- Need for training and education
- Need for showing of innovative products and technologies
- UZ Funding possibilities? More or less a precondition.
- Discussion in The Netherlands whether concept is aligned
 - Dutch Greenhouse Delta is willing to help by facilitating a meeting with the DGD partners
 - WHC Westland is willing to cooperate
 - Main question: Is there a business case!
- Detailed design of production & demo facility and business plan would be a logical first step in the next stage



Specific questions and remarks

- Is there sufficient support from the Uzbek horticultural sector and government to initiate and maintain a HKC?
 - Committment (public and private)
 - Funding (initial and on the long run)
- Good coordination of practical wishes, education and research
- Provide services related to the horticultural development
 Workshops, events, etc.



Thank you for your attention



- E: marc.ruijs@wur.nl
- I: <u>www.wur.nl/Onderzoek-Resultaten/Onderzoeksinstituten/</u>

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