

# Adaptive greenhouse design

Toward the most economical and sustainable protected horticultural production systems

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# Global issues

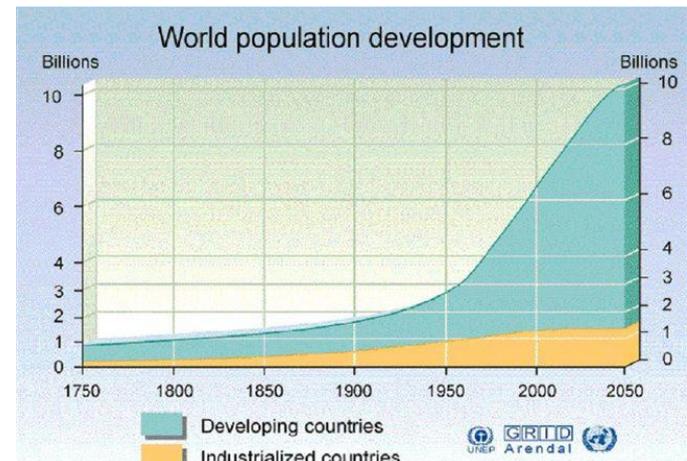
## Sustainability



## Food safety

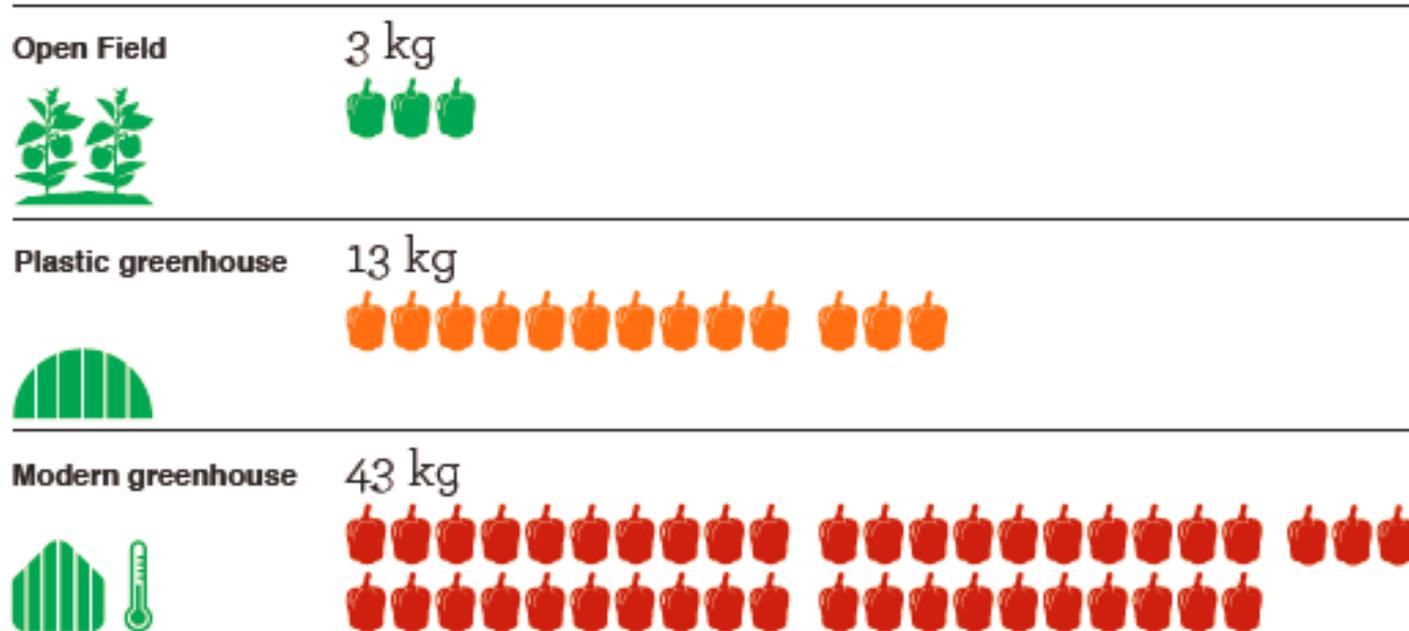


## Food Security



# Transition of horticulture

15x more productive



Increasing control of production factors

# Technology makes it happen

Water Use Efficiency in relation to technology

Liters water per kg tomato

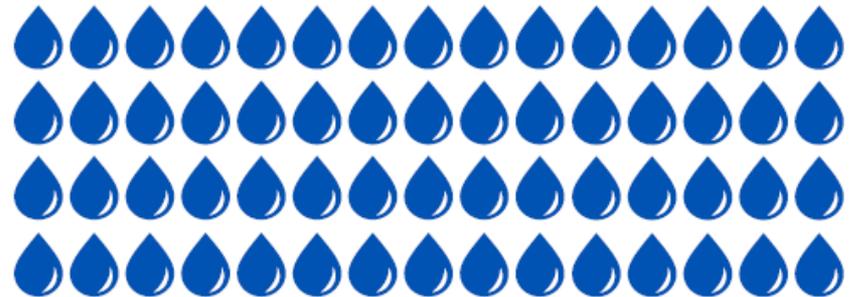
1kg



Outdoor production system



60 liters



Holland 'closed' greenhouse



4 liters

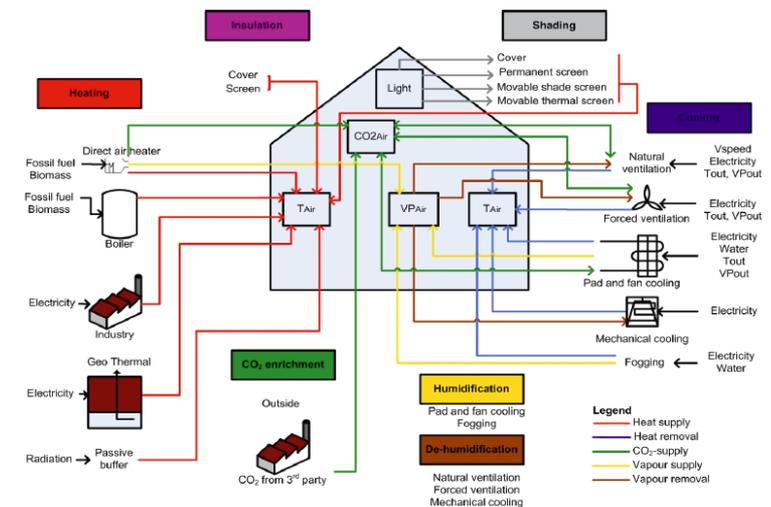
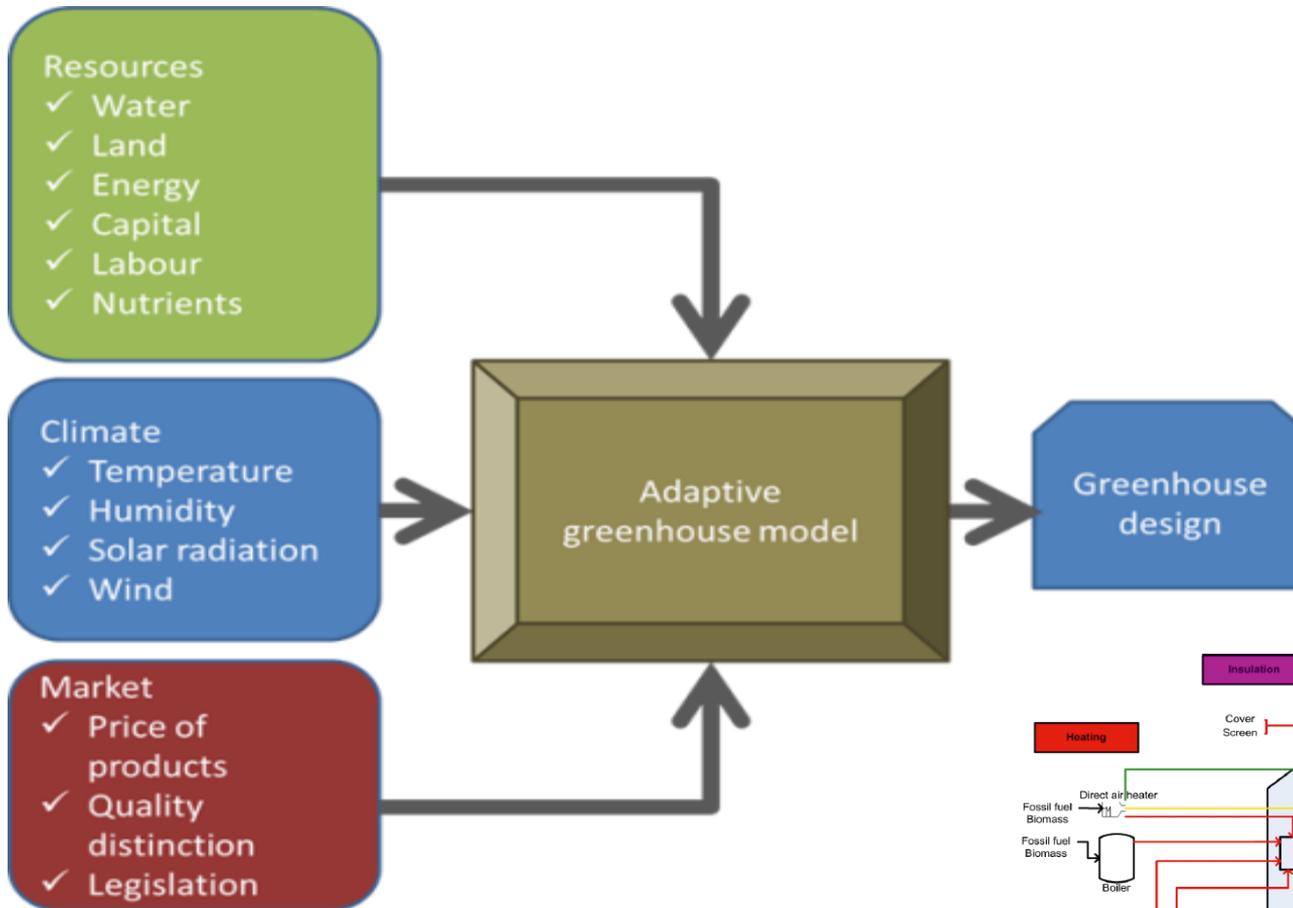


Source: Xxxxx



WAGENINGEN  
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# Adaptive greenhouse design



# Step by step approach

- Low/standard Tech  
(reference)



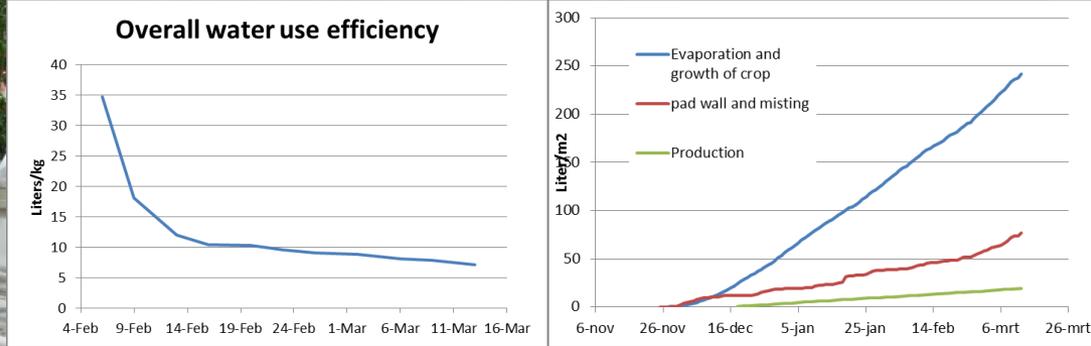
- Mid Tech



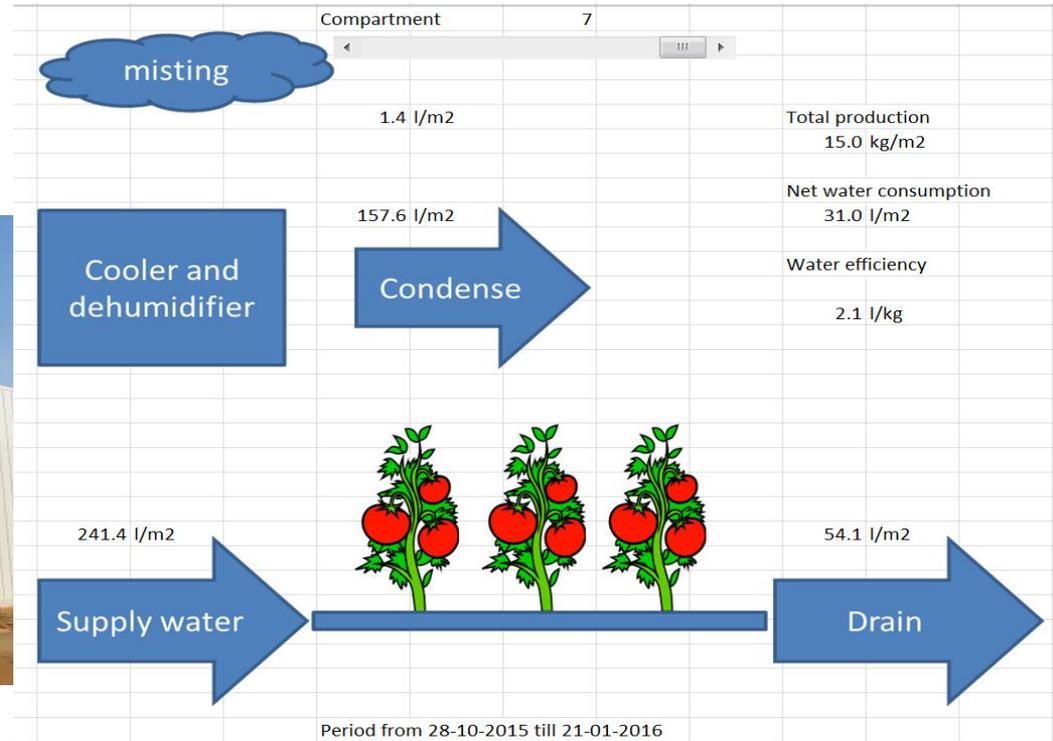
- High Tech



# Research center in Riyadh (Estidamah)



# Research center in Abu Dhabi (Baniyas)



**Water use efficiency: 2.1 l/kg!!**

# What further steps are needed?

- Improving the crop models
  - Effect of extreme climate on growth and production for all greenhouse crops
  - Influence of light spectrum on development and growth due to covering material (SMART MATERIALS project) and LED application



# Follow up is essential!



## Training

- Crop management
- Climate control
- Integrated pest management
- Fertigation
- Post harvest

## Remote assistance

- Platform for communication
- What's app (Photo's Video's)
- Daily operation reporting
- Questions
- Emergencies



Communication is essential!

Thank you for  
your attention

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