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# Opportunities for protected horticulture

in Saudi Arabia and the United Arab Emirates

## Main conclusions

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The authorities of the Kingdom of Saudi Arabia (KSA) and the United Arab Emirates (UAE) are making great efforts to diversify the economy, since in the longer term they wish to develop other sources of income to compensate for declining oil revenues. The scarcity of water gives cause to the need for its more efficient use, and for this reason protected horticulture is receiving a great deal of attention in both countries. The greenhouse industry contributes to sustainable development, creates appealing jobs for the indigenous population, and is compatible with the trend towards an increased demand for higher quality and safe food. Dutch knowledge and technology could provide support to the required developments in both countries.



## Saudi Arabia: demand for quality and advanced technology

There is a developing domestic market for horticultural produce. The consumption of fruit vegetables is relatively low in comparison with the neighbouring countries. The authorities are assigning an increasingly higher priority to food safety, and intend to introduce the requisite legislation and assurance system within a few years. There are currently virtually no inspections for residues, and at present only the wholesale market carries out spot checks. The increasing interest in organic products is also evidence of the trend towards safer food.

The number of modern supermarkets in the KSA is increasing rapidly, and they have now acquired a 40% share of the retail market. The majority of the fresh vegetables are sourced from domestic producers, as well as from various other countries in the region. Quality control is based on visual inspections. There is an increasing demand for high-quality products and food safety. A wide range of products are currently available, and have a good appearance. There are periods of relative scarcity which are linked to the religious calendar, such as the Hajj, when prices can readily double.

The majority of the 5,500 ha of glasshouses is allocated to the cultivation of tomatoes and cucumbers. The average glasshouse crop is low, amounting to approximately 8 to 9 kg tomatoes per m<sup>2</sup>. The potential is great: the leading companies grow 30 to 45 kg tomatoes per m<sup>2</sup>, and achieve high water efficiencies. There are just eight leading companies, and consequently many companies still have a lot of work to do before they reach these levels. In spite of the 5 to 6-year payback time for more advanced glasshouses, such as fibre-glass multi-tunnels with cooling, major investments continue to be made in lower-cost plastic tunnels. This in turn results in the average glasshouse crop of tomatoes remaining static at about 10 kg per m<sup>2</sup>. It is possible that this is in part due to the (interest-free) credit facilities provided by the Saudi Arabia Agricultural Bank (SAAB), which are focused primarily on medium-sized companies making limited investments. The SAAB finances 70% of investments up to €600,000, and 50% of investments from €600,000 to €4,000,000. The SAAB does not offer financing for investments in excess of €4,000,000, and consequently large companies need to seek other sources of funds. The SAAB offers a remission of 20% of the loan when repayments are made in accordance with the agreements. Many companies have managers from neighbouring countries. The employees working at the glasshouses receive in-house training; they originate from low-wage countries such as the Philippines or Bangladesh.

Riyadh's wholesale market constitutes an important sales channel for the farmers and a major procurement channel for, in particular, the smaller retailers. Some 300 suppliers deliver produce to the market every day. The prices are determined by auctions with increasing prices. During the visit it transpired that

rapid agreement is reached on purchase prices. There are about 25 companies, which may be represented by accredited middlemen. The modern supermarkets buy about 80% of their produce directly from the producers, and the remaining 20% is purchased at the wholesale market. In analogy with Dutch supermarkets, they source their produce from a number of suppliers and conduct very frequent negotiations on the prices.

Much of the horticulture sector's means of production is sourced from abroad and supplied via trading houses. Little public information about the greenhouse industry is available. The area allocated to each crop is published by province. However, no information was found about the number of holdings, types of holdings, or number of employees, etc. The Ministry of Agriculture recently implemented a Market Information System which provides data about the prices actually obtained for the produce, and at a variety of levels. The exchange of information between knowledge institutions and holdings is experienced as very poor, and this is also confirmed by various players.

The ornamental plant sector meets the growing demand from the consumer and urban landscaping markets. Those involved in the ornamental plant sector stated that some 5 companies, with a total area of more than 30 ha under cultivation, are active in this market. Pot and border plants are used to lay out beds and city verges, i.e. landscaping; the demand for these plants is increasing.

The agricultural sector consumes about 85% of the water supplies; households account for a further 10%, and industry for the remaining 5%. The cereal and forage segments of the agriculture sector each use about 30% of the total water supplies, and consequently the other segments consume 25%. The majority of Riyadh's water is obtained from desalination plants. Desalination costs between €0.85-1.10 per m<sup>3</sup>.





Saudi Arabia, an absolute monarchy, has 27 million inhabitants. The country has a young population: 38% is below the age of 14. The authorities' encouragement of the private sector, as the driving force behind the economy, is intended to increase the indigenous population's share in the economy - 'Saudization' - and to decrease the expats' share. The agriculture sector contributes about 10% to the country's non-oil GNP. The Saudi Government's development of the New Cities gives shape to its policies on diversification and increased employment for the local population. These new areas offer scope to the development of links in the agricultural chain, such as processing, trade and logistics. The city of Hail, in particular, is an extremely interesting region for the agriculture and horticulture sector. The city, located in the middle of Saudi Arabia, has an important agricultural hinterland and lies on the overland supply route from the Maghreb and Levant. Jazan, on the Red Sea, is important for the fishing sector. Jazan also accommodates an important port, and it plays an important role for the agriculture areas in the hinterland.

## United Arab Emirates: a multicultural society with a high purchasing power

The United Arab Emirates (UAE) is a federation of seven emirates. Almost 80% of the more than 4 million inhabitants are foreigners. The UAE, in analogy with the KSA, is also making major investments designed to greatly reduce the dependency on oil.

The vegetable crop has declined greatly in recent years. The self-sufficiency level in vegetables and fruit is about 60%: the level for dates, the major horticultural crop, is 100%, and for tomatoes, the major vegetable crop, about 75%. The UAE has 7,900 plastic tunnels with a total of 267 ha protected horticulture (inclusive of ornamental plant cultivation). Once again, there is a great demand for ornamental plants. The authorities offer a wide range of incentives to the horticulture sector in the form of subsidies and research facilities, although they remain explicitly in the background so as to offer scope for private initiatives.

Producers in the UAE use groundwater and desalinated water for irrigation, as well as treated waste water. The agriculture sector uses 55% of the water supplies, as compared to the KSA's more than 80%.

The Dubai Flower Centre (DFC), an ultramodern complex for perishables, opened more than six months ago. The DFC no longer focuses on flowers, but on perishables in general. The Centre's technology complies with all modern standards. The DFC's primary efforts are concentrated on improved East-West connections. 112 airlines - with 165 destinations - currently call at Dubai, and the number continues to increase. Dubai is currently constructing the world's largest airport, which plans to process 120 million passengers and 12 million tonnes of cargo per annum.





## Opportunities and threats in the Gulf States

The opportunities and threats are listed in Figure 1. This does not make an explicit distinction between the two countries; however, it will be clear that Saudi Arabia is the most important of the two in view of its much larger population. One of the major developments is the increasing demand for food safety and quality. The authorities appreciate the opportunities protected cultivation offers for more efficient use of water.

Food safety is regarded as an opportunity rather than a threat; however, self-evidently, many companies will nevertheless regard additional regulations as a threat. Protected horticulture offers improved control of the cultivation process, and practice in Saudi Arabia has demonstrated that the use of techniques such as biological crop protection is a feasible proposition.

**Figure 1. Opportunities and threats relating to protected horticulture in the Gulf States**

### Opportunities

1. The growing population and economy result in a continually increasing demand for vegetables and ornamental plants
2. Logistics and the agro industry receive a great deal of attention, for example the New Cities logistics centre
3. The authorities' endeavours to achieve diversification of the economy and privatisation of production. Priority is assigned to food production; the necessary funds are available (economic boom)
4. An increased water efficiency is possible solely with protected cultivation
5. The five-year plan assigns priority to training
6. The number of supermarkets based on Western operations is increasing. Requirements imposed on food safety and quality are becoming more stringent. Interest in organic produce
7. Desalination is relatively cheap, from €0.85 to €1.10 per m<sup>3</sup>
8. Familiar with the competences of the Dutch agricultural sector
9. Landscaping and flowers for everyday use are becoming increasingly common
10. Land is relatively cheap

### Threats

1. Limited cooperative-minded attitude in the Saudi-Arabian community, inclusive of the horticulture sector
2. The courses and training programmes for the agriculture sector are not really adequate, and interest is declining
3. Little insight into the returns from the consumption of water, for example in the cultivation of cereals and forage
4. Water is become more saline and scare. Only part of the cost is passed on
5. Extreme climate, with difficult cultivation conditions
6. Many employees are from abroad. Saudis do not find work in the horticulture sector appealing
7. The credit facilities are not favourable to large-scale project investments
9. Weak institutional framework for food safety and phytosanitary measures
10. Agriculture is regarded as a high-risk investment. Limited availability of capital

Both the industrial community and the authorities are aware of the availability of advanced cultivation technologies for protected crops. In addition, they appreciate that these technologies contribute to a more efficient use of water, an increased

number of jobs, and high-quality produce offering food safety. The Netherlands is regarded as the world's leader in these fields. Figure 2 lists the strengths and weaknesses.

**Figure 2: Strengths and weaknesses relating to protected horticulture in the Gulf States**

Strengths	Weaknesses
1. Few top holdings make use of advanced technologies.	1. Most companies use relatively old technology. Only a few of the leading companies are aware of the new and advanced technologies
2. Labour is relatively cheap, and the employees are trained on the job	2. Few training facilities for managers and experts. Little attention is given to advanced technologies at an academic level
3. Awareness of water's role as a strongly limiting factor	3. Little insight into the organisation of the chains and the economic forces acting on the chains
4. Modern, well-equipped wholesale market with equipment, for example, for tests relating to MRLs	4. Holdings and the authorities do not share the same viewpoint on the strategy of and critical success factors for the horticulture sector
5. Research relating to protected cultivation and biosalinity on some topics	5. Pad and Fan cooling complicates CO <sub>2</sub> fertilization
	6. Limited use of biological crop protection. Virtually no testing relating to MRLs
	7. Limited integrated research into protected cultivation, and virtually no interaction between research and practice
	8. Little economic data available. Differences in returns are unclear

**The SWOT analysis served as the basis for the determination of the following critical success factors:**

#### 1. Advanced technologies

Structural access to and the development of new and advanced cultivation technologies suitable for the desert climate is not organised at present. These technologies can support the policy focused on the more efficient use of water, more appealing jobs for the indigenous population, and safe food of a higher quality.

#### 2. Greenhouse industry strategy

There is no focused strategy for the development of the greenhouse industry. Collaboration is required between the authorities, knowledge institutions and companies that devotes specific attention to the development of an adequate framework.

#### 3. Insufficient knowledge of the basic facts relating to the greenhouse industry

Factual information about the structure and performance is required to analyse the current field of forces acting on protected cultivation. There is a poor insight into the current situation. This knowledge is required for the development of a substantiated strategy.

#### 4. Market development

Development of the market, providing safe and high-quality food for the emerging supermarket chains.

#### 5. Development of the cultivation of ornamental plants

Flowers are purchased more frequently, and cities devote a great deal of attention to attractive surroundings with plenty of foliage and flowers (landscaping). This development should also extend to the enhancement of consumers' knowledge about food safety and the care of plants and flowers.

#### 6. Institutional environment

The institutional environment must stay in line with international developments, such as food safety and participation in the labour market.



**The recommendations are:**

**1. Demonstration and training centre**

Public-private collaboration in setting up a demonstration and training centre. The objective of this centre would be to demonstrate the potential of high-grade horticulture technology. to provide a facility for training: ‘seeing is believing’ and to establish a live interactive link between research and the horticultural industry. Although this would primarily be based on practice, the centre should also endeavour to collaborate with universities and research centres. The centre could also offer an insight into the opportunities available for increased water efficiency and a lower use of crop protection agents. An expert and independent project manager would be responsible for the day-to-day management.

**2. Programme Coordinator, water management**

The agriculture sector, as a major consumer of water, should devote explicit attention to water management. A Coordinator could create support in the agricultural sector, ensure that a dialogue is initiated, and coordinate public-private collaboration in research, the provision of information, and the implementation of the programme. Particular attention will need to be devoted to a demonstration project. The Saudi Ministry has experience with an in-house organic farming expert.

**3. Knowledge-exchange programme**

The Gulf States are of the intention to develop a knowledge-intensive horticulture sector, and this could be furthered and advanced by collaboration with Dutch agricultural and knowledge institutions. The possibilities include the exchange of staff, courses for students in the Netherlands, or specific training programmes.

**4. The provision of support to a Market Information System**

The enhancement of the Saudi initiative to implement a price-information system. Europe and the Netherlands have acquired a great deal of experience in the public information systems relating to the structure of sectors and to performance indicators (prices, incomes, cost prices) required to improve the sector’s efficiency and performance. Consultancies use the information from these services to improve companies’ strategic focus.

**5. Support for Quality Assurance systems**

European and Dutch experience with quality assurance systems, inclusive of monitoring and accreditation, can be made available and implemented via consultancy assignments.

**6. The supply of plant material, advanced technology and knowledge of logistics**

Dutch companies can make use of the opportunities available for the provision of these products and services. +In addition to customisation for individual companies there is certainly also a need for the provision of large-scale turn-key projects. Opportunities are also offered by the development of the infrastructure of new cities in which attention is also given to new, large scale food-supply concepts. Once again, it will be necessary to provide substantiation for the protected horticulture sector’s support of regional ambitions.

**7. The provision of extremely high-quality niche products**

The multi-cultural society of the UAE, in particular, has a need for luxury products. The development of the tourist and service sectors offers opportunities for the provision of products that are scarce in specific periods, or for the provision of a broad range of produce (such as in the cut-flower and vegetable segments). It is expected that the national crop will be large, and that the sector will be confronted with substantial competition from neighbouring countries. Within this context specific attention needs to be devoted to supplies during periods of religious tourism in the KSA.



# Colophon

Protected horticulture has perspective in the Gulf States. The governments aim at a lower dependency on oil income by diversifying the economy. The actual state of the protected horticulture chain is analysed in the framework of Porter's diamond. Development strategies for Saudi Arabia and for the United Arab Emirates are identified. From these perspectives, the cooperation possibilities with the Dutch have been derived. The research is funded by the Dutch Ministry of Agriculture, Nature and Food Quality, program BO Cluster International.

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