Needs Assessment of the Agriculture in North-West Tunisia

Evaluation of the key priorities for agricultural resilience

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Preface

In March 2017, the WUR president Louise Fresco was the Keynote speaker at a FAO organised conference on the state and future of African Agriculture that was held in Tunis. During that conference, FAO, the Tunisian Ministry of agriculture and WUR concluded that the sustainable development of Tunisia's agriculture was currently hindered by a number of obstacles. The three parties further concluded that the support of FAO and Netherlands knowledge on sustainable agricultural development could help to tackle these obstacles.

It was left to FAO and the Netherlands Embassy to further identify the obstacles. This identification resulted in a letter of FAO to the Tunisian ministry of Agriculture that stated the agricultural region of North-West Tunisia as region for special attention and suggested the following subject areas:

- Soil conservation, combating the loss of topsoil;
- Siltation of agricultural water reservoirs;
- (further) Development of a Climate Smart Agricultural policy;
- Integrated chain development in horticulture and dairy;
- Improvement of the agricultural research and education.

In the absence of any indication of potential financial support from the FAO, the Netherlands Bureau Agricole pour le Maghreb contracted Wageningen Research to carry out a quick needs assessment to identify the obstacles in more detail:

- Identify and analyse agricultural problems in the North-West of Tunisia, specifically the problems related to climate change, and corresponding needs on Tunisian side;
- Describe the possibilities for knowledge transfer from the Netherlands in order to face above mentioned challenges, by more substantially identifying and analysing the suggested subject areas for Dutch–Tunisian cooperation.

This needs assessment is a step for a cooperation between Tunisian government, knowledge institutes in The Netherlands and FAO, which might possibly lead to a future knowledge transfer program/plan in Tunisia.

Summary

Agriculture plays a leading role in Tunisia's economy, the sector faces major challenges and Tunisia still depends on food imports. The government of Tunisia is looking for opportunities to increase national food production fitting the current and future climatic conditions.

Therefore, the Netherlands Embassy in Tunis together with the Tunisian Ministry of Agriculture, Fisheries and Water Resources proposed to organize an exploratory mission led by three experts from Wageningen University and Research (WUR) to evaluate the situation and further identify the key priorities for future cooperation in relation with the FAO.

The delegation was asked to execute a clear needs assessment that: Identifies and analyses agricultural problems of the North-West of Tunisia related to climate change; analyses the needs linked to these agricultural challenges and describes the possibilities for knowledge transfer from the Netherlands.

Based on interviews with stakeholders and field visits an overview of the current general situation and challenges for innovation is provided, especially tailored to the subthemes: climate and water, soil, the primary production (farming systems, horticulture, potatoes, and livestock), the supply chain, and extension services.

From the discussions we learned that Tunisia has high ambitions to innovate the agricultural sector towards a high level of produce and export, capable to comply with the EU regulations and to resist climate change. Although Tunisia has ample knowledge and skills in various agricultural areas on meta level the country is lacking a value chain approach, a lack of access to knowledge and investment capital and no strategy on climate change.

When analysing the subthemes, we considered following needs and priorities of Tunisia:

1. For climate smart agriculture: increase water availability, reduce the need for water
2. For soil: decrease degradation, increase fertility
3. For primary production:
   a. sustainable innovations at multiple level in horticulture
   b. improve seed quality and introduce storage facilities in potato produce
   c. improve continuity in production for the market and create added value by processing in the dairy sector
4. For the general supply chain: introduce a market driven approach
5. Farmer-inclusive agri-business development: organise farmers towards an efficient market orientation

For the follow-up, we propose to perform

a) scoping studies for each of the 5 mentioned themes in which an in depth diagnosis, a plan of improvement and a plan for upscaling are described and
b) to design 2 pilots in selected value chains (potato and dairy) for farmers, retail and sales. These pilots should aim at implementation of new innovative techniques and new processing techniques to create added value and also aim at capacity building, building of awareness on sustainability and care for the environment, networking and collaboration (both with other farmers and private companies).

Considering the experience of Dutch knowledge institutes in these fields, we expect that collaboration could be valuable to address the needs.

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Abbreviations

ATC	Ministère de l'Agriculture, Des Ressources Hydrauliques et de la Pêche - Agricultural extension and Training Centre
EKN	Netherlands Embassy in Tunis
FAO	Food and Agriculture Organization of the United Nations
FBOs	Farmers Based Organizations
GAP	Good Agricultural Practices
GDP	Gross Domestic Product
GIVLAIT	Groupement Interprofessionnel des Viandes Rouges et du Lait
GOT	Government of Tunisia
IRESA	Institution de la Recherche et de l'Enseignement Supérieur Agricoles
NGO	Non Governmental Organisation
OEP	Ministère de l'Agriculture, Des Ressources Hydrauliques et de la Pêche- Office de l'Elevage et des Pâturages
SIAMAP	Salon International de l'Agriculture, du Machinisme Agricole et de la Pêche, i.e. a biennial meeting organized by the Union Tunisian of Agriculture and Fisheries.
ToT	Training of Trainers
VIG	Vegetables Interprofessional Group
WUR	Wageningen University and Research

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1 Introduction

1.1 Problem analysis

Agriculture plays a leading role in Tunisia's economy, with approximately 16% of the country's workforce engaged in the agricultural sector. Historically, Tunisia's agricultural system was based on small family farms that grew subsistence crops with little market integration, but larger agricultural enterprises are increasingly prominent. Public land may be leased by the government to private farmers or managed directly by the Ministry of Agriculture. Foreigners cannot own agricultural land but may obtain long-term leases.

In 2015, the food processing sector accounted for over 1,000 enterprises each employing 10 people or more, 20% of them producing solely for export. The production value of this sector is around $5 billion annually, and is continuously growing due to improved household purchasing power and changes in eating habits towards consumption of processed products versus fresh ones.

Even though agriculture is an important sector in the Tunisian economy, the sector faces major challenges and Tunisia still depends on food imports. The government of Tunisia is looking for opportunities to increase national food production fitting the current and future climatic conditions. This would strengthen national food and nutrition security, generate employment and income, and save costs through import substitution. To achieve this, the Tunisian government launched an agriculture and rural development strategy and a five years implementation plan to open up the local market internationally and import knowledge and experience in order to help the local economy.

The Netherlands is the second large exporter of agricultural products in the world, and has a very advanced knowledge when it comes to agriculture. Education and research in the Netherlands has resulted in significant value creation. This requires a highly efficient system that incorporates new scientific insights continuously. A system in which research institutes collaborate closely with industry (including farmers), government and civil society.

1.2 Fact finding mission

The Tunisian government (GOT) has indicated its vivid interest in cooperation with the Dutch knowledge organisations in the agricultural field to support the socio-economic development in Tunisia. Therefore, the Netherlands Bureau Agricole pour le Maghreb together with the Ministry of Agriculture, Fisheries and Water Resources proposed to organize an exploratory mission led by three experts from Wageningen University and Research (WUR) to evaluate the situation and collect the key priorities for further cooperation.

The GOT wanted to focus on 6 topics for this mission to Tunisia. These topics were expressed in a mail to the Dutch Embassy in Tunis on the 18th of October 2017 and were based on an earlier discussion to identify how a tripartite partnership between the GOT, FAO and Dutch knowledge organisations could create synergy in the process:

1. To support the agricultural sector in Tunisia till 2030;
2. Prevention and treatment of siltation in dams;
3. Prevention of soil degradation and promotion of the introduction of conservation agriculture in the North-Western region;
4. Support of the dairy, horticulture and potatoes sectors (specifically production of seeds);
5. Support of improving resilience of the agricultural sector related to climate change;
6. Reinforce human development and institutional capacities, especially related to scientific research and higher agricultural education.

To further identify the key priorities of the Tunisian agricultural sector and main issues for collaboration, a better insight in the agricultural sector and its needs and stakeholders was required. This identification needed consultation with as many as possible stakeholders in the food production chain.

The Netherlands regional agricultural office of the Maghreb (EKN) wished to promote the Dutch agro-food companies in the Maghreb area and participated in the SIAMAP 2017; the biennial International Exhibition of Agricultural Machinery and Fisheries, which took place from **31 October to 05 November 2017.** The Netherlands Embassy in Tunis was present with a Holland Pavilion. A visit of this fair was an exquisite opportunity to meet large numbers of different size companies, farmer organisations, NGO's, policy makers, knowledge organisations and other stakeholders in the agricultural sector. In this regard, the Embassy requested the Ministry of Agriculture, Fisheries and Water Resources to benefit from this opportunity at the SIAMAP and to prepare a program including work meetings and visits in the context of "the Prospective of the Agricultural Sector and Food in Tunisia by 2030", with a first focus on:

- Integrated sustainable soil fertility management;
- Climate smart agriculture;
- (horticultural) Value chains.

The delegation was asked to execute a clear needs assessment that:

- Identifies and analyses agricultural problems in the North-West of Tunisia, specifically the problems related to climate change;
- Analyses the resulting Tunisian needs relevant to agricultural challenges in this region and identifies potential stakeholders involved;
- Describes the possibilities for knowledge transfer from the Netherlands in order to face above mention challenges, by more substantially identifying and analysing the already suggested subject areas for Dutch–Tunisian cooperation and giving an overview of relevant Dutch expertise.

During our visit we spoke with many different governmental institutes and organisations to identify the specific needs based on above mentioned topics as well as additional topics such as livestock and dairy.

1.3 Approach and programme

The visit was programmed and coordinated by the International Cooperation Department of the Ministry of Agriculture, Fisheries and Water Resources and facilitated by the Netherlands Embassy in Tunis. Although the embassy had requested to focus on the 3 above mentioned themes, the International Cooperation department of the Ministry had organised interviews with representatives from the livestock sector and visits to livestock farms specifically included in the program, while soil fertility and degradation remained underexposed. Therefore, the focus of this report has somewhat shifted from the assignment as described in the contract.

The needs assessment was drafted on the basis of interviews with stakeholders involved and short field visits, in order to get a first-hand picture of the issues to be researched and advised on. A visit to the SIAMAP in Tunis created an exquisite opportunity to meet and interview several stakeholders in the agricultural sector.

Field visits were programmed in the North-West region of Tunisia. The North-West region specifically consists of governorates Béja, Jendouba, Le Kef and Siliana (outlined with blue borderline in Figure 1.1). For this mission the most North East governorate Béja was visited.

The programme of the mission is shown in Annex I.

Figure 1.1. A map of Tunisia and its governorates. In blue, the border of the North-West governorates of the country.

2 Challenges in the Tunisian agriculture sector

This chapter provides an overview of the current general situation and focuses specifically on the challenges in agriculture in North-West Tunisia. Findings are based on a three-day mission and a brief literature review. During the three-days-mission meetings with many stakeholders and experts were programmed. The list of the persons spoken to can be found in Annex II, together with their function and organisation.

The challenges identified relate to the subthemes: climate and water, soil, demography, the primary production (farming systems, horticulture, potatoes, and livestock), the supply chain itself, and extension services.

2.1 Climate and water availability: current situation and challenges

In general, Tunisia has a distinct Mediterranean climate with hot dry summers and mild moist western winds in winter. Precipitation is divers but may range from 1500 mm/y in a small area in the North to less than 200 mm/y in the south. The country can be divided into three areas, which are bound by specific isohyets, the line which represents an area with the same amount of precipitation.
The Northern part can be defined as the agricultural area of Tunisia with diverse crops and rainfall between 400 and 1500 mm/y. The central "Sahel", and Southern part are even more restricted by the 400 mm/y isohyet to the North, and the 200 mm isohyet to the South. Though the central part does have some agriculture such as olive trees, the south only has marginal agriculture in the region (Ritzema *et al.*, 2014).

Tunisia scores 122.5 on the annual average Climate Risk Index, the lowest class (>100) of countries affected by the impacts of weather-related loss events (floods, heat waves, etc.). In 2016 this value was 54, the second to last class of 5 classes. (Eckstein et al., 2017). However, a growing population in an already arid region to begin with, general water scarcity and irregular rainfall throughout the year are major issues for Tunisian agriculture. North Africa is particularly affected by droughts that are more frequent, more intense and longer-lasting (Radhouane, 2013). Although a water supply of 1000 m^3 per inhabitant/year is needed, current water availability is only 420 m^3/year (N. Visser, personal communication). The majority of water in Tunisia (80%) is used for agricultural purposes (AquaSTAT, 2017). Shortage of water for crop growth causes both drought and salinity stress (due to an increase of soil matrix potential) of crops.

The main occupation of people living in Northern Tunisia is in agriculture, therefore the effect of droughts on (crop) production can affect the country as a whole (UNDP, 2017). An example is the Danida project in North Béja (central Tunisia) in which dairy production is promoted (VNG International, 2017). In this project, it was monitored that the average precipitation in the last three years was so little compared to previous years, that the production of fodder decreased with 50% during these years, preventing livestock from being able to produce enough milk from the provided fodder.
Also, during rainy periods the soils in these arid regions are not able to absorb or channel rainwater fast enough, and erosion and/or waterlogging occurs, which prevents crops from taking up oxygen from the soil, resulting in a decreasing yield. Vertisols are especially known for waterlogging conditions during rainfall.

For extreme weather changes the possibilities for agriculture are diverse; new varieties can be selected and introduced to cope with the extreme weather conditions (drought, waterlogging periods, etc.).

CHALLENGES related to CHANGING CLIMATE:

- Low resilience to climate change and overall the quality of seeds are is not high. Low productivity.
- Diminishing water availability for agricultural use in combination with decreasing water quality.
- No waste water treatment and waste water reuse for agricultural purposes, not sufficient training and knowledge of governmental staff on this topic.
- Limited applied Climate Smart technologies per region and for different crops.
- Know how in reduction of salinity in groundwater, building dams for water storage, irrigation application and management.

2.2 Soil: importance, challenges

Several soil types can be found in Northern Tunisia:

- Young (alluvial) soils (e.g. cambisols): formed in recent alluvial deposits in the riverbed. These soils are characterized by high organic matter content in the upper layer. They are deficient in lime and have a good water permeability, making them suitable for many crops, in particular fruit trees. In wet areas with poor drainage (saline) marshes can develop.
- Dark and brown soils (e.g. vertilsols) suitable for agriculture, as long as they are not too dry (large cracks form in the top layer), or too wet (heavy swelling and smearing of the clay).
- Brown limestone soils, with a (shallow) humus rich top-layer (e.g. leptosol) usually not able to hold enough (rain) water.

Soil erosion related to water and wind play an important role in Tunisia. Especially in the Northern part of Tunisia, erratic rainfall and changes in ploughing techniques increased erosion. Potentially 2,800,000 ha of land is sensitive to (soil) erosion (commissaire Hamrouni, personal communication) which leads to a loss of fertility in the topsoil.

Though many farmers expressed that there is a local culture in which application of organic material (crop residue, manure) as part of fertiliser management to their fields is common, research shows that the organic matter in agricultural fields is slowly decreasing.
Another major threat in Tunisian soils is salinization, which mainly occurs alongside the coastal areas and increases as water is pumped from deeper aquifers to apply to crops.

CHALLENGES related to SOIL:

- Identified sustainable (good) agricultural practices for specific crops, related to local circumstances and focussed on maintaining or improving soil fertility and reducing soil erosion in agricultural fields.
- Not sufficient use of local available resources and how these can best be applied.
- Lack of overview of crops with specific potential areas for agriculture, related to climate change, soil fertility and crop use.
- salinization in agricultural fields (coastal areas).

2.3 Primary production

Tunisia is the 59th largest export economy in the world and the 40th most complex economy according to the Economic Complexity Index (OEC, 2017). In 2016, Tunisia exported $12.9B and imported $18.8B, resulting in a negative trade balance of $5.89B. In 2016 the GDP of Tunisia was $42.1B and its GDP per capita was $11.6k.

About 9 % of the GDP originates from agricultural activities. Roughly 500.000 people are working in the agriculture sector, while 80 % of the water is allocated to agriculture. The Tunisian government is keen to ensure that the rural population does not come to the big cities. To this end, the government is searching for ways to provide a decent life to the rural population in general and specifically to the youth.

2.3.1 Horticulture

Vegetable crops cover about 170,000 ha. There are approximately 90,000 vegetable growers across the country providing yearly an average of 4 million tons of vegetables. Protected crops represent ca. 9,000 ha:

- 1,650 ha under cold greenhouses;
- 7,000 ha under small tunnels;
- 240 ha under heated greenhouses.

Tomato is the main crop, which produce about 1.2 MT/year. It is mainly field tomato, but part is grown under cold greenhouses or greenhouses heated by geothermal waters in the south of the country.

Most products supply the local market as fresh products. The early production of vegetables lead to a head start for the Tunisian agriculture compared to countries with a moderate climate. Most of these early products are exported to France, Italy, Netherlands, Libya, Germany and Russia.

To discuss the bottlenecks in this sector, we visited representatives of the Vegetables Interprofessional Group (VIG), an organization of public economical interest, endowed with the civil personality and financial autonomy. This organization is under the supervision of the Ministry of Agriculture and its members are both agricultural producers and transporters or exporters of the products. VIG has the following tasks:

- Assure a link between the different steps of the supply chain,
- Ease the cooperation between professionals and public administration,
- Contribute to balance the market by employing different mechanisms in collaboration and coordination with professional organizations and public administration,
- Participate in the promotion of exports in collaboration and coordination with professional and public organizations,
- Collect, analyse and classify information, set up data bases relating to the fresh vegetable sector, and carry out studies on the national and international situation and the forecasts.

CHALLENGES related to HORTICULTURE:

- The production area is too small and dispersed for an adequate export production capacity.
- The quality of agricultural products does not comply with the quality required for export.
- Smallholders cannot afford well-equipped greenhouses with sustainable techniques that focus on saving water and managing climate. So, in mono-tunnel and plastic greenhouse represents the large share of protected crops in Tunisia.

2.3.2 Potatoes

Potatoes are grown on around 27,000 ha of sandy soils and production is 370 MT/year. This is about 17% of the county's cultivated land, located essentially between Cap Bon, Bizerta, Jendouba, Gafsa, Kasserine and Sidi Bouzid. Potatoes represent the second crop in the country after tomatoes. Spunta, Bellini and Nicola are the main varieties, however other varieties are purchased as well as shown at the SIAMAP (Figure 2.1). Potato is, with tomato and wheat, one of the staple food in the Tunisian diet.

Tunisia has four potato seasons, however only the first and second season can be considered as main seasons regarding volumes:

1. 1st season: January - June
2. 2nd season: September - January
3. Extra season: October - February
4. Small scale: December - April

Ninety % of the farmers plant less than 1 ha of potato, and only 10% of the producers plant more than 3-4 ha. The average production is 18-20 ton/ha. However, the variations between farms is high: small farmers produce only 12-15 ton/ha and big farmers up to 60 t/ha. Yields of smallholders are so low due to lack of: implementation of GAP, access to buy inputs, and mechanisation.

The supply chain is depicted in Figure 2.2. Potatoes are harvested continuously from March through July, as well as in December and January (Horton *et al.*, 1986). The only period where storage becomes important is in the months between the end of the main harvest in July and the beginning of the late harvest in December. But, as the stock conditions are not yet well developed, there is a shortage of supply during those two months of the year. In those months potatoes are imported. With regard to the conditions of the storage systems 70% of the storages are traditional storages, and only 30% are more modern conditioned storages. It is guessed that in average about 10% of the potatoes are lost in stock - to our knowledge so far, no exact data on losses have been collected nor are losses in the different stocking system compared to each other.

Figure 2.1. Different potato varieties, presented at the SIAMAP

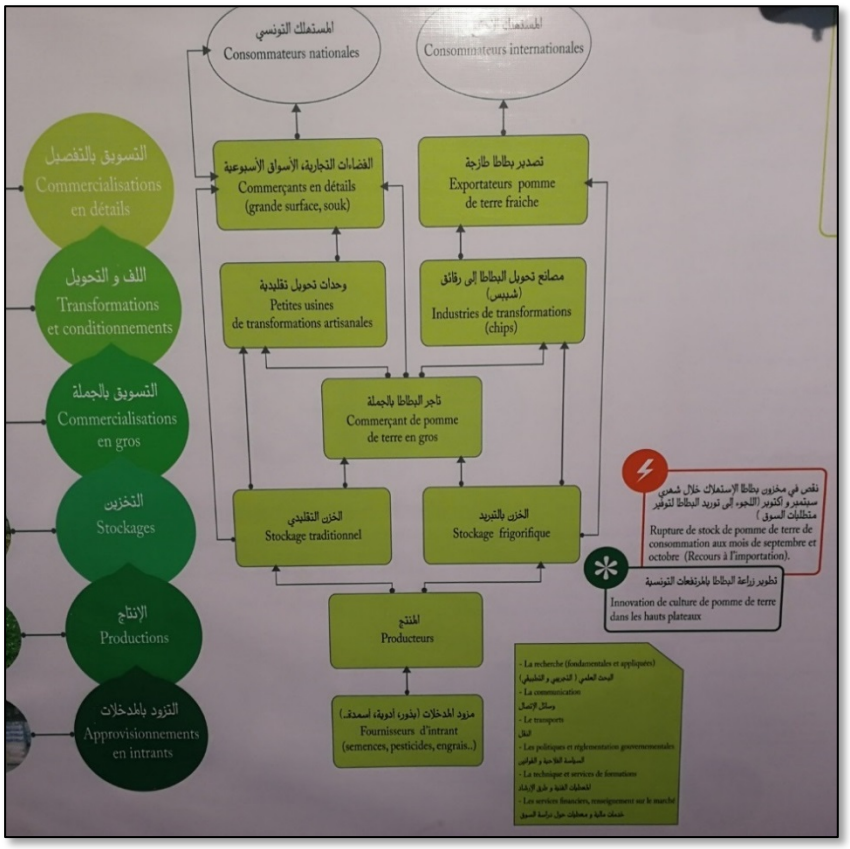

Figure 2.2. Potato supply chain from farm to industry

Another raised bottleneck in the potato production was the **seed production**. The total need for seed potatoes in Tunisia is much higher than the national production can supply at this stage.

This forces Tunisia to import a big part of the needed seeds. Currently the biggest part is imported from France, while in the past import took also place from The Netherlands. However, it is a Tunisian goal to become totally independent on imports.

CHALLENGES related to POTATOES:

Consumption potatoes:

- There is a need for import of seed due to insufficient production and stock conditions
- Limited yields in production
- Large stock losses
- Limited capacity / knowhow on potato storage

Seed potatoes:

- There is a need for import of seed due to insufficient production and stock conditions
- Problems with aphids, (semi-)fungi (like *Phytophthera*), viruses and bacteria (especially *Erwinia*)
    - Limited availability of suitable land; limitations in management decisions.
    - Insufficient follow up by farmers on GAP
    - Lack of technology/know how.

2.3.3 Livestock with special focus on dairy production

Livestock has an important share of agricultural production. It contributes to approximately 40 % of the total agricultural product, however its contribution is inferior to cereals and olive that dominates traditional Tunisian agriculture.

Dairy production

Tunisia has 112.000 dairy producing farms. It exports to more than 20 countries, most of them within Africa. Libya is the biggest export market. However, Ivory Coast, Morocco, Russia (for cheese export), and Qatar (recently developed as a new market) are also of importance. The majority of the export is pasteurized milk. For this product Tunisia has compared to Europe a competitive advantage due to its geographic position. Export from Tunisia to EU does not yet take place due to strict EU regulations on quality and vaccination programmes to which Tunisian producers cannot yet comply.
Tunisian farmers have on average between 2-3 cows, in North-Béja 4 cows. Ninety-four % of the smallholder farmers have less than 10 cows. The focus of the government is on the support of the smallholders, as it is there that the problems of quality and cost of production are the biggest. The middle sized farms could be trained to make cheese on farm, as there is a need to add value to the primary produce.
Cow breeds for milk production are in principal three types: Holstein 58% (±5000 L/y), improved cow breed 32% (±1100 L/y), local cow breeds 10% (±600 L/d). The quality of the milk in the North is better than the one in the Centre and South. The reason for this is that cows in the North are fed with concentrate.

Tunisia knows two seasons (summer/spring and winter/autumn). In the summer/spring production is too high, and stocking is not sufficient, leading to a problem with keeping milk fresh. On the other hand, milk production is limited in the winter and this needs to be regulated to produce enough milk throughout the year. Thus, there is a need to improve milk stock. It was indicated through several interviews that it could be interesting to look into added value by introducing other dairy products like yoghurt, cheese, etc.

Milk surplus in summer/spring is stored in three ways: storage at low temperature, transport in the form of powder milk or as pasteurized milk. The strategic stock hold is at this moment 50.000.000 l/year.
Tunisia has 240 collection centres (out of which 220 are HACCP certified). The function of the collection centres is to collect the milk twice a day from small farmers and bulk it for transportation to the factories. There are 11 factories which produce milk with UHT (high temperature milk) (4 million L/d) 140 degrees, 7 s, pasteurized is 72 degrees 10 s). Nine yoghurt plants produce yoghurt (750,000 L/d).

The large farmers send their milk directly into the factory (Figure 2.4). Milk from smallholders is brought to collection centres and from there into the factories.

The government fixed the price for milk on farm and on market level. The fixed price for producers for 1 l of milk is 0,27 Euro (~ 0,77 dinar, TND) and on the market level 0,30 Euro/l (~ 1,12 dinar, TND). The cost price of farmers is 0,22 Euro/l. Based on this figures Euro 110 – 1.000 can be generate by small holders by milk selling (see Table 2.1.)

Table 2.1. Total annual income in € depending on amount of cows

	Type I	**Type II**	**Type III**	**Type IV**	**Target**
Category	**Small holder in Tunisia**	**Smallholder in Tunisia**	**Smallholder in Tunisia**	**Farmer in North-Béja**	**Target for business case North-Béja**
Amount of cows	2 improved cows	1 Holstein & 2 improved cows	3 Holstein cows	4 Holstein cows	10 Holstein cows
Milk production (l/y)	2200	7200	15000	20000	50000
Milk prices (€/ l)	€ 0.05	€ 0.05	€ 0.05	€ 0.05	€ 0.05
Total annual milk income (€/y)	**€ 110.00**	**€ 360.00**	**€ 750.00**	**€ 1,000.00**	**€ 2,500.00**

Farmers in the North of Béja need to have at least 10 cows in order to have a business case for the farmer and the collection centre. Currently, apart from a pilot, no bonuses are paid for milk quality, and also no penalties are given in case of poor quality.

In the dairy chain some good examples are built on chain development, however the ambitioned production increase could not yet be realised although, the project stimulates the increase of milk productions strongly (see poster on SIAMAP in Figure 2.3), the project faced a decrease by half of its production during the last 3 years. Due to severe water scarcity milk production dropped from 120,000 MT to 60,000 MT (2017).

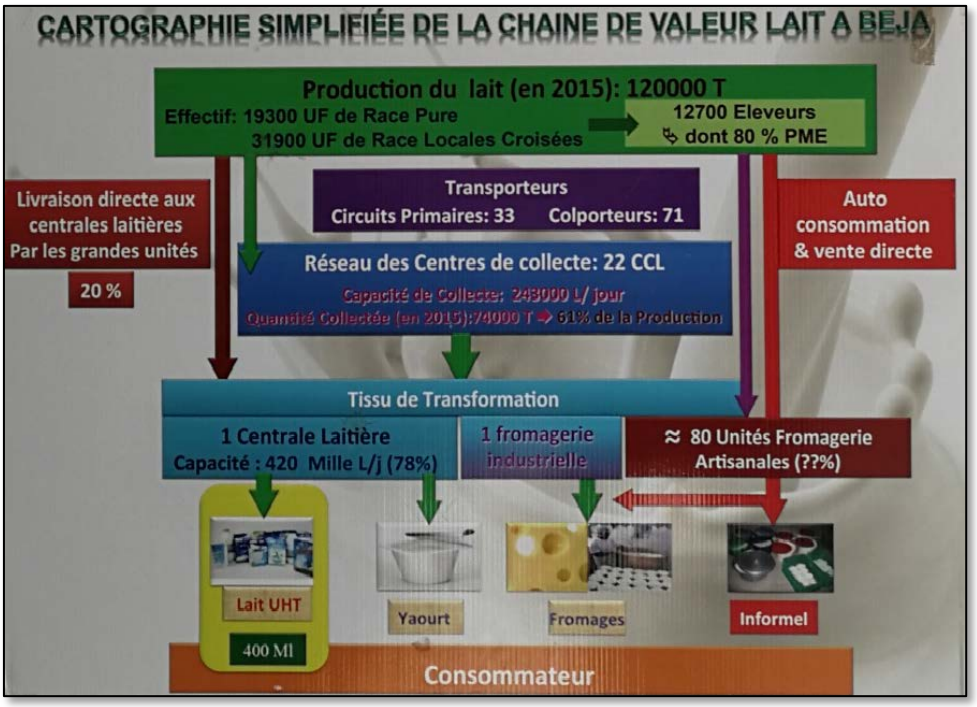

Figure 2.3. Poster on Danida-project in Béja, presented at SIAMPA

The climatic conditions for milk production are getting more and more critical and farmers are even selling cows and move into the production of other produces. It is estimated that 4% of the cows have been sold last year.

CHALLENGES related to DAIRY and MEAT PRODUCTION:

- Large variation in quantity and quality of meat/milk
- Competition on water use between animal production and food crops
- Too little added value for farmers
- No developed value chain
- Insufficient fodder quantity and quality due to limited availability land and unsecured availability of water
- Not yet payment for milk quality

CHALLENGES related to DAIRY PRODUCTION:

- Irregular milk supply, storage capacities need to be improved and increased
- No production of milk products value chain
- Uncertainty on competiveness in the long term
- High production costs

2.4 Supply chain

In the observed supply chains actors are not yet interlinked and are not yet trading with each other in a supply chain approach matching products to market demands and consumer preferences. In all reviewed sectors, products are marketed through a fragmented chain characterized by many handlers, hardly any cooperation, and no integration, which results in high supply risks, high transaction costs, price inefficiencies and quality losses. On small-scale some first examples are built in the dairy sector and the seed potato production. But generally, there is a still a lot of room for improvement in order to get the right agriproduct, in the right place, at the right time, in accordance with the right specifications, and the lowest prices. In the interviews hold it was noticed that the focus was much on production increase of farms and that the importance of transportation, storage, distribution and chain management is a new area yet insufficiently taking along. Especially on the level of smallholders, due the low organizational rate in FBOs, the space for improvement is significant. Today, they heavily depend on middlemen to sell their product, leaving them with insecurity of availability of markets, prices and quality demands.

CHALLENGES related to SUPPLY CHAIN:

- No developed supply chains, the individual chain actors trade with each other but do not share yet a joined vision
- No good examples and methods yet on how to develop value chains
- No agro-logistics plans on national-, sector- or supply chain level

2.5 Agricultural farms: situation and challenges

2.5.1 Farming systems

Currently, Tunisian agriculture is in a transition phase from traditional agricultural systems to innovative sustainable agricultural systems, both for smallholders and entrepreneurial and commercial farmers. The ministry of Tunisia is an active driver of the process and looking for collaborating partners teaming up with them. Collaboration have already been established like for instance with the Danish development organization Danida in the north-Béja in the dairy sector, FAO, Swiss cooperation, and etc.

Basically three different agricultural farming systems can be distinguished: 1. smallholders, 2. medium scale entrepreneurial farmers, and 3. the industrial farmers.

Smallholders represent the majority of the farmers. In 2009, 87 % of the farmers (equivalent to 516.000 farms) had less than 20 ha of land (Institute of Agriculture Research and Higher Education, Ben Rayana Aniss, Feb. 2009). They have a high dependency on family labour and a low mechanisation rate.

In Tunisia, farmers are hardly organized in farmers based organizations (FBOs) and/or doing group selling, only 4% of the farmers are organized in larger organisations. The reason for the low organization rate goes back to farmers' bad experience with cooperatives in the sixties of the former century in the communist time. It is therefore that till today small farmers are frequently selling their products to the retail, farmers being the vulnerable party in getting a fair share out of the profit from the chain or even of their traded product. The retail has little interest in organization of farmers and in adding value to farmers' product by direct market linkage, quality improvement, or by the introduction of new products. Under these circumstances it is difficult for banks to provide access to finance to those farmers. Stimulation of the agro-sector and smallholders specifically is done by a zero-tax policy for the primary sector, access to government subsidies, and stimulation of funded projects e.g. in the form of bilateral cooperation.

As a matter of fact, less and less young people show interest in taking over the family farms, they prefer to find jobs elsewhere and migrate. This is a big challenge, and there is an urgent need for solutions leading to an improved economic situation of rural areas and a future for the young generation there. Organization of farmers in FBOs is seen as the first and highest priority, as it could solve several of the above mentioned challenges. As women are very active in the agriculture field a gender sensitive approach is of importance.

Medium and entrepreneurial farmers or even 'mobile farmers' are often well educated, even sometimes living in cities, and depend on workers in order to manage their farms. For entrepreneurial farmers agriculture is a choice and not, as for smallholders, something which is done due to a lack of alternatives for other economic activities. They see agriculture as a good option for investment, and can benefit from the zero tax policy for the primary production and subsidies.

The government has determined public land to attract entrepreneurial, modern and young farmers interesting in pioneering in sustainable and innovative farming systems. The universities of Utrecht and Wageningen (Prof. Dr. Gert Kema) are involved in this project. Innovation centres and centres of excellences could there be developed.

Industrial farmers are big farmers who heavily depend on labour, have access to finance and can invest in technology and knowhow. This are very powerful but commonly 'they do not want share the cake'.

In these three farming systems the needs are very different and also the time needed to realize changes is different. The focus of the government is mainly on the smallholders as they present the majority of the farmers and are the biggest future challenge. Government wants to provide solutions in terms of supply chain management, clustering of farmers, adding value to the products, etc. Medium and entrepreneurial farmers are an interesting target group for the Tunisian government for modernisation and transformation of the sector, and they could become the motor of change in Tunisia.

2.5.2 Demography (of farmers): current situation

Tunisia has an increasing population, but through implementation of family planning, the government has been able to reduce this growth to a little over 1%/y. The average life expectancy reaches 69 and 71 years for men and women, respectively. The government has an active policy to keep the rural population, which makes up 33.2% of the total population of 11.3 million people, in the rural areas, and tries to improve opportunities for work in these areas. The average age of farmers increases (now on average 60 years and rising). Especially agricultural jobs are made attractive for the youth, as this area has few incentives for young people to work in this sector (UNdata, 2017). Similar development projects for rural areas in Tunisia were undertaken in previous decennia (Demongeot, 1983).

In the Béja governorate, which we visited during the mission, these local jobs are created through livestock, which is stimulated by building dairy stables and modern milk collection centres in the area. Specific details about dairy farms and milk centres are explained in more detail in chapter 2.4.3. The development of these locations is in full progress.

CHALLENGES related to SMALLHOLDERS:

- Low productivity of crops and milk
- Low organizational rate
- Lack of skills and limited knowledge on Good Agricultural Practices (GAP)
- Limited cost-effective way of production
- High dependency on middlemen and limited direct linkage with factories
- Little added value on the production side to increase price
- Little future perspective for farmers (migration of the generation to big cities and increase in more and more elderly farmers)
- Low rate of mechanization
- Little knowledge of markets and not embedded in the supply chain
- Expensive for GOT to reach out to smallholders
- Difficulties to get access to finance in e.g. a bank

Dominance of unorganized smallholders is a strong limiting factor for the agriculture sector as a whole and challenges described here are just as applicable in all following points under 'primary production'.

2.6 Extension services: current situation

We visited the 'Agence de la Vulgarisation et de la formation Agricole', the extension services, and spoke with Pr. Zayani Khemales, general director, and Prof. Mahmoud Elies Hamza, president. The organisation is a public organisation and comprises 23 institutions, from which 12 for research and 11 for education, working on the themes: Agriculture, Hydrology, Fisheries, Food Science, Plant Protection, Veterinary and Economy. The organisation has a close relationship with the Ministry of Agriculture. The last years, the organisation is shrinking due to a decline of subsidy by the government. Currently, the agents visit farmers only once a year. That means that new methodologies and approaches are needed. Water scarcity and climate change are considered to be the main key priorities for Tunisia.

Many young people are generally less interested in being employed in extension service, though for some it is one of the few jobs which can be found in the region. Yearly, 120.000 students graduate from the universities. Only, 50% originates from rural areas. As a result, there are insufficient workers for field work, while unemployment in the big cities is increasing.

The ministry is now establishing new training centres on different themes to educate young people for all steps in the food production chain and to stimulate them to look for jobs in the agricultural sector.

CHALLENGES related to governmental institutes (special focus on extension service):

- The focus on production crops with high water demand (watermelon, citrus);
- Cattle breeding needs much more water than crop growth;
- Reuse of wastewater is not sufficient, both due to lack of technology and to farmers' resistance to introduce used water into their production system.
- Need for new cost efficient approaches to reach out to farmers
- High focus on farm production in the past without taking into account other processes (knowledge development, training).
- Limited knowledge on the concept of value chain development and private-public-partnerships
- Need for paradigm shift

The communication between extension services and farmers Tunisian agricultural sector is both top-down and bottom up. In both directions communication takes place, but mutual (horizontal) communication between farmers is not well structured. The ministry tries to stimulate mutual communication between farmers by the provision of cell phones and the introduction of digital traceability technology for monitoring and control (diseases, drought, etc.). But it is still a challenge to persuade farmers to a collective use.

The extension services try to better involve the private sector and to stimulate public-private partnerships, but farmers are still not willing to pay for services or training. A new paradigm on payment for services is needed.

We discussed the issue of upscaling of farms and reallocation of land. We launched the idea to have less farmers possessing more land as a possible opportunity for innovation of the sector, but this was considered to be not feasible in Tunisia. However, we advocate to keep various options in this context open in future and consider this to be a task of the Ministry.

3 Needs and priorities Tunisia and collaboration opportunities with knowledge institutes of the Netherlands

From the discussions during the visit we learned that Tunisia's main ambitions are to innovate the agriculture towards a higher-technological and higher educational level, to acquire a full export position capable to comply with the EU regulations and to introduce a resilient agriculture, capable to resist climate change. At the same time, we observed that Tunisia has knowledge and skills in various agricultural areas and enough manpower to deploy jobs. However, on meta level the country is still lacking capacity to develop the agricultural sector towards its goals, such as:

- There is limited use of a value chain approach.
- Farmers (especially smallholders) are hardly organized in farmers based organizations and reluctant to get involved, which makes it difficult to create impact from government to farmers adequately involved.
- Smallholders have limited access to knowledge as mutual communication between farmers is not well structured and it is not common practice to share knowledge between farmers. Meanwhile, the extension services are shrinking due to a decline of subsidy by the government.
- Smallholders do not have access to capital to invest in innovation and possibly have difficulties to find the right path to governmental subsidies.
- Although the threats of climate change are considered, there is clear approach on the induction of Climate Smart Agriculture.

These are main bottlenecks for innovation. For each subtheme, mentioned in the former chapter, we describe the needs below a priority in more detail.

3.1 Climate Smart Agriculture: increase water availability, reduce the need for water

Water scarcity is one of the main resource problems of Tunisia as described in chapter 2.1. Due to climate change, problems may become worse in the near future. A major challenge is how to manage and conserve water supplies in order to be able to face the dry periods of the year. The irrigation equipment e.g., currently used, is not innovative and generates many water losses due to evaporation and during water transport.

In the South, water used for irrigation is currently extracted from the huge fossil Sub Sahara Aquifer. Although the quantity of water still available is not known, it can be expected that this aquifer is a finite resource. Competing for water between humans' consumption and use for agriculture will increase.

Possibilities to solve the problems are:

- Improved water harvesting techniques to hold the rainwater which does precipitates in the area.
- Decrease in water use in agriculture by:
    - Enhancement of irrigation management to prevent water losses
    - Introduction of / focus on (sub soil) drip irrigation
    - Increase in water use efficiently by selecting quality crops with a low water foot print and/or drought resistance
- Improve waste water reuse for agricultural purposes;
- Ecological water management by introduction of dykes and dams (rivers/estuaries and coastal lagoon- and saline areas)

3.2 Soil: decrease degradation, increase fertility

Decreasing organic matter in agricultural fields pose threat to sustainable crop production for both crop yields as well as fodder supply to livestock (chapter 2.2.). Furthermore at a larger scale, (wind) erosion can increase loss of fertile top soil from agricultural fields.

Options for collaboration should focus on:

- Knowledge at national level about the current status of fertility in the soil
- Combining collected data in which biophysical aptitude and socio-economic feasibility show areas in which certain crop-market opportunities exist and can be made visual.
- Discussion with all stakeholders involved to identify actual production limiting factors and stakeholders' ownership and responsibilities in solving these issues.
- Identification of smart opportunities to increase soil fertility for crop production through a combined application of organic and locally available fertilisers.
- Field technology for monitoring and control in agricultural fields (DSS).
- Introduce and growth of climate smart crops (drought/salt tolerant) as well as management practices such as rotation.
- Analyses of soil crop based balanced (organic) fertiliser recommendations and with the inclusion of available regional fertiliser resources.

3.3 Primary production

3.3.1 Horticulture: sustainable innovations at multiple levels

The main problem in horticultural sector is the relatively low level of technology, a lack of good public-private partnerships and no adequate cooperation within the chain. To solve the problems in horticulture, following challenges are identified:

- Verify whether introduction to multi-tunnel and high tech sustainable greenhouses will solve production problems and will help small farmers to use new technologies
- Identify market demands and organize the value chains in such a way that it can meet these demands.
- Encourage partnerships between producers and (foreign) investors in public-private partnerships
- Encourage collective action of small farmers, e.g. through producer organisations or joint ventures with private companies
- Look for opportunities for upscaling

3.3.2 Potatoes: improve seed quality, introduce adequate storage facilities

Potatoes: idea for value adding and better control of markets by farmers. A study is needed to assess whether improved storage capacity and supply chain management can bridge the supply shortage of two months and match Tunisia's production with the national consumption.

Dutch knowledge institutes have a long experience in the production of high quality seeds and (re)organization of potato supply chains, improving storage capacity and by doing so reducing food losses and increasing farmers' income. Also, the Netherlands is world-leading provider of potato storage solutions.

3.3.3 Dairy Sector: improve continuity in production for the market, create added value by processing

As explained in chapter 2.4 the development of the dairy chain is still young, fragile and heavily relying on government stimulants (subsidies, fixed price), external funding, and not yet driven by the private sector. Some of the main issues and opportunities related to dairy farms mentioned were:

- Better storage capacity.
- Introduction of processing milk on farm.
- Produce cheese from the surplus of milk during season with high milk production and link this to production of cheese from imported milk powder during the season of low milk production.
- Cut the middlemen of the processed products.
- Premiums for farmers who produce high quality milk.
- No tax for agricultural products.

Support from Dutch knowledge institutes can be given through:

- Feasibility study on the future of milk production and the creation of added value under changed climate circumstances
- Develop a new strategy for the sector
- Climate smart and market driven chain development

- Improved storage of milk
- Organization of producers
- Agro-logistics

3.4 General supply chain: introduce a market driven approach

For a well-functioning agro-food supply chain all activities in the supply chain need to be included in order to match products to market demands and consumer preferences. This includes product quality and food safety, transportation, storage, distribution and chain management. By matching supply to demand food losses and waste can be reduced tremendously, efficiency increased and costs reduced.

Dutch knowledge institutes have a lot experience with integrated approach to (re)design, implement and upscale effective agro-food supply chains. Totally new supply chains are designed to ensure food security and provide income to farmers. Design and enrolment can take place:

- on a national level integrating all agro-logistics services and creating a national agro-logistic plan
- for a whole sector, and/or
- specific values chains by introduction of technologies for production of new products, processed from primary products (like cheese, yoghurt, etc.).

With the available knowledge in the Netherlands knowledge institutes could support Tunisia in order to select the best product market combinations in a market driven approach, and (re)design the supply chains by taking into consideration:

- hardware (e.g. infrastructure, logistics),
- 'orgware' (e.g. organization of stakeholders, alliances), and
- software (e.g. skills knowledge, transfer).

Such an approach could particularly provide solutions to the challenges described in the horticulture - and dairy sector in order to a) timely match supply and demand, b) find the best new climate smart and value adding product market combinations c) increase the productivity by reducing losses.

3.5 Farmer-inclusive agribusiness development: organise farmers towards an efficient market orientation

As many issues require a change in the system and successful adaptation of a good agricultural practice truly depends on the farmers willingness and mentality, it is crucial to have a good framework for introduction of innovations in farm management. In Tunisia, it is not common practice to share knowledge between farmers. Thus, farmers (i.e. smallholders) have less access to knowledge on new technologies, but once seen at their neighbours' farm they might be convinced by its success and become empowered to adopt. Gender and youth is important. Convert the thinking (mental thinking). Organize farmers in farmer's based organizations. Keywords in this process are: farmer entrepreneurship, governance of farmers' organizations, economic services that these organizations can deliver to their members, stakeholder collaboration, policy environment, promoting farmer-inclusive value chain development.

Here, the introduction of farmer field schools (FFS) might be very useful. FFS are professional study groups for professionals, primarily responsible for knowledge transfer. FFS, once initiated in the 80's through a FAO programme in Indonesia, is now applied worldwide to introduce new practices in any field of agriculture. FFS are developed particularly for field studies and consists basically of groups of people with a common interest. FFS are considered to be a sufficient method for knowledge transfer and to introduce new production practices in Tunisia with the aim to increase productivity and sustainability, because FFS improves productivity and farmers income (Davis et al., 2012) and has proven to be empowering in a wide range of developing countries (Braun et al., 2006; Davis et al.,2012; Godtland et al., 2004). From previous examples of large scale development at rural scale important lessons can be learned (Demongeot, 1983).

There is an opportunity to make a demonstration/show case and empower farmers to visit these showcases together. Through cooperation with Friesland Campina or partners (such as Frico) and with help of simple technical techniques farmers can work towards becoming middle farmers instead of staying smallholder farms.

4 Suggestions for next steps

In order to support the Tunisian government in their agricultural goals for the coming years, following needs and priorities of Tunisia as suggested in chapter 3 can be summarized:

1. Climate Smart Agriculture: increase water availability, reduce the need for water
2. Soil: decrease degradation, increase fertility
3. Primary production:
    a. Sustainable innovations at multiple levels in horticulture
    b. improve seed quality and introduce storage facilities in potato produce
    c. improve continuity in production for the market and create added value by processing in the dairy sector
4. General supply chain: introduce a market driven approach
5. Farmer-inclusive agri-business development: organise farmers towards an efficient market orientation.

To start up a trajectory to stimulate social and technical innovation on each of these themes might be reached by an increase of the level of organisation between smallholders. This may increase their access to knowledge on good agricultural practice, to new sustainable technology and to market demands. It may also increase their access to money for investment in technical development and increase their awareness of the need to shift towards sustainable farm management and care for the environment.

4.1 Short-term follow-up

The first pathway to be developed is picking the 'low hanging' fruit by performing practical, directly executable short running projects, for which we propose a twofold approach:

1. To perform **scoping studies** on each of the 5 above mentioned themes in cooperation with local stakeholders. For each theme an inventory is needed in which following steps are essential elements:
    a. In depth diagnosis on: innovations needed; modelling of the economic feasibility, perspectives and benefits for the farmers (small holders); environmental impact; needs for implementation (both technical innovation, but also empowering and capacity building, collaboration, networking); needs for introduction of local subsidies and adaptation of legislation;
    b. Plan for improvement;
    c. Build of first good examples;
    d. Plan for upscaling.

2. To select 2 value chains, e.g. potato sector (from seed production to market), and the small holder dairy sector for **the setting up of 2 pilots** for farmers, retail and sales. These pilots should aim at implementation of new innovative techniques and new ways of produce to create added value.
    The expertise on introducing private sector development through innovative public-private partnerships is essential to boost the inclusiveness within the value chain. This means, that next to the farmers also the organisation of farmers, the help of GOT and the extension services need to be taken into account. Research institutes are very well capable of experimenting at regional scale, but the introduction of these results and the adoption of knowledge by farmers is difficult. Training of extension services, and supporting this process of bringing knowledge to farmers from extension, through ownership and bottom-up ownership of farmers' input is the main task to bring entrepreneurship to farmers. So, the pilots should also aim at capacity building, building of awareness on sustainability and care for the environment, networking and collaboration (both with other farmers and private companies). Farmer Field Schools are proposed as a practical and hands-on management approach to train and coach farmers and trainers in all phases of the pilot.

4.2 Knowledge transfer from the Netherlands

To address the needs, collaboration with Dutch knowledge institutes would be valuable. In general, following expertise from Dutch knowledge institutes could be useful to start up innovation trajectories:

- Soil stability, quality and soil management
- Stress Physiology (salinity and drought) and phytopathology
- Precision agriculture and water management

- Post-harvest technics and supply chain management/agro-logistics
- Rural economy and rural development
- Communication science

4.3 Costs

Calculation of the costs for the Netherlands involvement is hard to determine without a detailed proposal but a rough indication may be following

- Deployment from Dutch knowledge organisations in the 5 **scoping studies** may last about 6 weeks for each theme. Estimated total costs for 5 studies: **€ 165.000.**
- The design of the **2 pilots**, involvement of local stakeholders during field visits, and coaching of the start-up could be done in one year. Estimated costs for deployment from Dutch knowledge organisations are € 100.000 for each pilot, totally **€ 200.000** for both pilots.

  If additional support from the Dutch knowledge organisations is needed to backstop the stakeholders during the implementation of the pilot, the experience in an Algerian project on 'Sustainable water use in El Oued', financed by Partners for Water and the ministry of Economic Affairs, shows that a budget is needed of about **€ 600.000**.

4.4 Long-term trajectory

The second pathway to be developed is creating a structural, long-lasting triangular partnership between the Tunisian government, knowledge institutes in The Netherlands and the FAO, focussing on the themes, currently missing critical mass in Tunisia, i.e.: 1) Climate Smart Agriculture, 2) Soil Degradation and Fertilization and 3) Supply Chain. In this cooperation, knowledge from the Netherlands can be used to bring up key priorities for the political way forward and to support policy-making on sustainability. This may be effectuated by the arrangement of a structural (2-3 years) secondment for senior staff members from the Netherlands to the FAO Regional Office, executed by 3-month missions of several experts on the above mentioned themes and coordinated by FAO. The opportunity for rolling out this pathway depends on the availability of funding and should be discussed further.

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Annex I. Programme of the visit

	Republique Tunisienne Ministère de l'Agriculture, des ressources Hydrauliques et de la pèche	

Projet de Programme
De la visite officielle de trois experts de l'université néerlandaise de Wageningen
Tunis, 31 octobre - 4 novembre 2017

Mardi 31 Octobre 2017

18h40	Arrivée des experts de l'université néerlandaise de Wageningen à Tunis

Mercredi 01 Novembre 2017

Visite au Salon International de l'Agriculture, du Machinisme Agricole et de la Pêche (SIAMAP)

10h00	Stand du Groupement Interprofessionnel des Légumes (GIL)
11h00	Stand du Centre Technique de la Pomme de Terre et de l'artichaut
12h30-14h00	Déjeuner
14h30	Stand du Groupement Interprofessionnel des Viandes Rouges et du Lait (GIVLAIT).
16h30	Stand de l'Office de l'Elevage et des Pâturages (OEP).

Jeudi 02 Novembre 2017

09h00	Réunion de travail à l'Agence de Vulgarisation et de Formation Agricoles (AVFA) en présence des représentants de l'Institution de la Recherche et de l'Enseignement Supérieure Agricoles (IRESA).
12h00	Déjeuner
14h00	Visite d'un centre de formation organisée par l'AVFA
16h00	Visite à Dr. Michael George Hage, FAO coordinateur

Vendredi 03 Novembre 2017

08h00	Visite à Béja assurée par l'Office de l'Elevage et des Pâturages (centre de collecte du lait, fromagerie artisanale)
12h30	Déjeuner
16h00	Réunion au cabinet présidée par Mr. Le Chef du Cabinet du Ministre de l'Agriculture des Ressources Hydrauliques et de la Pêche

Samedi 04 Novembre 2017

	Départ des experts

Coordination : Chokri Zairi // Direction de la coopération Internationale// P : 96307128

Annex II. Persons and organisations visited

No.	Organisation (French)	Name	Function (French)
1	Ministère de l'Agriculture, Des Ressources Hydrauliques et de la Pêche (Office de l'Elevage et des Pâturages)	Naziha Dridi Hajlaoui	Directeur Général Adjoint
2	Ministère de l' Agriculture Office de l' Elevage et des Patureges	Mohamed Nasri	Directeur Général
3	Centre Technique de la Pomme de terre et de l'Artichaut (CTPTA)	Khalifa Rachid	Chef service stockage et transformation
4		Essid Mohamed Farouk	Chef service physiologie et sélection variétale
5	Ambassade du Royaume des Pays-Bas	Hans van Vloten Dissevelt	Ambassador
6		Adel Ouni	Chef Adjoint du Département Economique
7	Stand du Groupement interprofessionnel des Viandes Rouges et du Lait (GIVLAIT).	Ouhichi Riadh	Ingénieur en chef
8		Rjaibi Kamel	Directeur Général
9	Ministère de l'Agriculture, Des Ressources Hydrauliques et de la Pêche (Agricultural extension and Training Centre)	Zayani Khemales	Directeur General
10	IRESA (Institution de la Recherche et de l'Enseignement Supérieur Agricoles)	Prof. Mahmoud Elies Hamza	Président
11	FAO	Ahmed Bougacha	Assistant au Représentant de la FAO en Tunisie Programme
12		Michael George Hage	coordinateur pour l'Afrique du Nord
13	Développement Agricole de Manoubaa	Hedi Hamrouni	Le Commissaire Régional au Développement Agricole de Manoubaa
14	Ministère de l'Agriculture, Des Ressources Hydrauliques et de la Pêche (Office de l'Elevage et des Pâturages)	Sana Zitouni	Ingénieur en Chef Spécialiste en Production Animale Coordinatrice Nationale de Project Tunisie-Danois
15	Végétales Interprofessionnel Group	Ismail Ghezal	General Directeur
16	Ministère de l'Agriculture, Des Ressources Hydrauliques et de la Pêche	Aniss Ben Rayana	Coordinateur du bureau de la Coopération Internationale

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Report WPR-720

The mission of Wageningen University and Research is “To explore the potential of nature to improve the quality of life”. Under the banner Wageningen University & Research, Wageningen University and the specialised research institutes of the Wageningen Research Foundation have joined forces in contributing to finding solutions to important questions in the domain of healthy food and living environment. With its roughly 30 branches, 5,000 employees and 10,000 students, Wageningen University & Research is one of the leading organisations in its domain. The unique Wageningen approach lies in its integrated approach to issues and the collaboration between different disciplines.