Agriculture in Turkey: The Current State vs. Turkey's Potential

Tanzer Bilgen
CEO, Doktar

Turkey has approximately 20 Million hectares of cultivated land, i.e. 25% of its territory is suited for agricultural activities. Around 60% of these fields are used for grain production whereas fruits & vegetables take up about 20%; the remaining 20% is reserved for forage plants and oleaginous seeds. As of 2016, 20 Million hectares of farmland creates a total value of 60 Billion USD: 40 Billion USD worth of vegetative production and 20 Billion USD in animal production add up to this total figure.

The size of agricultural sector in Turkey has been stagnant for the last five years. Although the current level of production seems sustainable, the real challenge lies in fostering growth for the agricultural sector. Vital factors such as soil quality and climatic conditions present no barriers to steady growth: A total growth to more than double the current size of the sector, which translates to a boost from 60 Billion USD to 150 Billion USD is achievable. In order to realize such growth, it is necessary to increase the yield per unit area in grain production, thus making more space for growing higher value-added crops like fruits and vegetables.

Sustainability in Agriculture

However, there are three fundamental issues to be addressed in order to bring about such a transformation in agriculture and create a sustainable outcome.

Financial Sustainability

The transition to high value added products escalates the need for investment and operational capital. The per-decare cost of wheat lies somewhere between 100-150 Turkish Liras (approx. 35-50 USD), whereas the per-decare cost of tomatoes for paste production can go up as high as 1.800 Turkish Liras (approx. 630 USD). That being the case, financing sources have to become more extensive and cost-effective. Our estimates suggest that farmers require a total of 40 Billion USD in financing for an output worth 60 Billion USD. Farmers are able to raise only 8 Billion USD with their own capital, whereas the remaining 32 Billion USD is acquired from debt financing. 50% of all debt financing in agricultural production is dealt with by Ziraat Bankası (Agriculture Bank), Türkiye Tarım Kredi Kooperatifleri (Agricultural Credit Cooperatives of Turkey, via Ziraat Bankası), Denizbank and other private sector banks; the other 50% is covered by debts supplied by the markets at extremely high seasonal interest rates, well in excess of 30-35%.

One other key issue related to sustainable growth in the agricultural sector is predictability. A farmer has to know beforehand what he/she should expect to earn by the time of harvest in order for him/her to make a sound decision about which crops to plant and grow. Contract farming has to become more common and the futures exchanges have to become more specialized to tackle problems of uncertainty. The opening of Borsa Konya (Konya Commodity Exchange) -in the city of Konya, traditionally known as the ‘grain silo’ of Turkey- in February 2016 has definitely been a move in the right direction.

Environmental Sustainability

If the value of agricultural production is to be boosted up to 150 Billion USD, the yield per unit area, as well as the total amount of cultivated areas must be preserved.

Typical factors which have a negative impact on soil productivity include incorrect irrigation practices which lead to land salinization, excessive use of pesticides and fertilizers causing soil contamination, and the overuse of groundwater resulting in droughts.

The progressive shrinking of cultivated areas due to urban sprawl poses yet another major problem: Prime agricultural areas such as Küçük Menderes Plain (İzmir Torbalı, Tire), Çukurova, Gediz Plain and Trakya are all endangered by urban growth.

Human Capital Sustainability

The average age of Turkish population is 28; however the average age of Turkish farmers is as high as 54. The numbers indicate that valuable agricultural know-how might be lost forever merely within 5 to 10 years from now. Hence it is crucial to incentivize younger generations to continue farming and to provide farming towns with social institutions for education, healthcare, sports and recreation.

One other alarming aspect related to human capital is the lack of agricultural engineers and technical staff with sufficient knowledge of value added crops such as fruits and vegetables. Instead of consulting to experts from South Africa for citrus, or Italian experts for apples and Spanish experts for stone fruits, what needs to be done is to transfer knowledge and create a local accumulation.

Last but not least, the constituents within the agricultural sector must be furnished with analytical skills.

A Holistic Approach to Food Value Chain for Sustainable Growth

Agricultural sustainability alone would not suffice to increase the size of Turkish agricultural economy up to 150 Billion USD. The food value chain has to be restructured with a holistic approach in order to achieve sustainable economic growth for the sector.

A Shift to Market Oriented Value Chain Perspective

Take for example, a Turkish company producing deep-frozen french fries: The company receives an order from the German market for 10.000 Tons of A-quality fries. The agricultural department would typically put all its effort into procuring potatoes at the lowest possible price level, if it is not engaged in active communication with the production department. A-quality french fries are usually longer than average and preserve a certain degree of crispiness after preparation; i.e., the factory must process potatoes larger than 60 mm in diameter and have a high dry matter rate. Failure to meet these specifications results in the company producing 42 Kilograms of french fries for every 100 Kilograms of raw potatoes. However, production efficiency can be increased up to 60% if the company procures the right kind of potatoes to start with.

In fact, the challenge to get a hold of just the right potatoes goes much further than the procurement stage: It is up to the agricultural procurement department to advise the farmers to plant 800 seeds per decare -instead of 1000 seeds per decare- and to apply a specific fertilization program high on potassium. Still, that’s not all there is to it; the contractual agreement between growers and the company must incentivize production of potatoes that comply with the specifications. All in all, the

company must be willing to pay a few more Cents per Kilogram to those with the right produce. The 50% increase in production efficiency would easily offset a 10-20% rise in the cost of raw materials, thus making the operation a profitable one. As can be seen, both the farmers and the company benefit from the optimization of value chain to meet the demands of the consumer.

The Role of Digital Agriculture in fostering Growth

Our projections suggest that digital agriculture could contribute a value of more than 35 Billion USD on the way to increasing the size of Turkish agricultural economy from 60 Billion USD to 150 Billion USD.

Digital agriculture will provide farmers with access to relevant technical knowledge that is time critical; enable farmers to decrease their input costs while increasing the quantity and quality of their output, which will bring about a rise in their incomes. Agricultural engineers will have the decision support tools necessary to solve farmers' problems. Digitalization in agriculture will make it easier to pick out growers who achieve higher levels of crop quality, and allow food-manufacturing companies to procure higher quality materials with ease.

While digital transformation in agriculture serves to streamline the communications between constituents operating within the sector, the real quantum leap will happen in the ways we produce, process and make sense of agricultural data.

Highly specialized sensors located on the fields and the machinery will make it possible to collect data such as the timing and amount of fertilizers used. Once gathered, the data will be superimposed with climate and yield data on a per-field basis. These sets of data will then enable us to construct mathematical models to boost efficiency on the farmers' side and to maintain a sustainable growth in Turkish agricultural sector.

At Doktar, we strive to realize this vision of "Connected Agriculture", as we call it.

We believe that Turkey has a vast agricultural potential. In order to exploit this potential and increase the size of the agricultural sector to 150 Billion USD, we have to adopt the value chain approach and integrate technology further into agriculture without compromising sustainability principles.