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Sustainable Agriculture – Solutions for a Changing Food Production System



*UN predictions estimate the world population to reach 9 billion people by 2050. To meet the increased demand for food, the Food and Agriculture Organization (FAO) predicts that food production will have to increase by 60%. The agricultural players of today have a big task ahead – growing an increased amount of food in a safe way, without using more natural resources and without harming the environment, writes stars alumna Dr. **Ismeta CURKIĆ**, Sustainable Agriculture Expert and Consultant.*

Two years ago, when asking a young and open-minded grower about which sustainability-related innovations from companies would be most useful for him, his answer was: “The innovation either needs to make my life easier or it needs to help increasing my yield”. Sustainable farming was very important to him, but clearly, he was looking for additional solutions to facilitate his work.

Since the green revolution in the 1960s, intensification of food production has helped countries and governments throughout the world to feed their citizens. Never before was it so easy to produce food. At the same time, the increased agricultural productivity came with a heavy cost to the environment. The negative impacts that followed with the expansion of agriculture included issues of safety, environmental pollution and increase of land use, water and other natural resources. Today, 70% of freshwater globally is used for agricultural purposes, reaching up to 80-90% in some water scarce and low-rainfall areas. Estimations suggest that agriculture is the driver of 80% of deforestation globally. With 24% of global greenhouse gas emissions, the agriculture and deforestation segment is the second highest emitter of global greenhouse gas emissions (2010 data). After the intensification period, the clear focus in agriculture today is sustainability.

What is sustainable agriculture?

There is not an aligned definition of what sustainable agricultural systems encompass. However, existing definitions comprise the aspects of meeting the nutritional needs of societies by making best use of nature's goods and services while at the same time not damaging them and thereby not impacting future generations. Sustainable agriculture combines aspects of economic profitability of the farmer, environmental health and social welfare of the farmer, farm workers, their families and communities. To ensure environmental health, sustainable agricultural systems aim to set measures to improve soil health, conserve water, optimize the input use of fuel, fertilizers and crop protection products, and promote biodiversity. However, as attractive as the benefits of sustainable agricultural systems are to the environment and humanity, the transition to it is a demanding and long-term task.

What are the barriers to transition to sustainable agriculture?

The pathway to transition into sustainable agriculture is a challenging one. It is a task that requires changes within an ecosystem of different players, including growers, private businesses, investors, consumers and others. The following list is not exhaustive, but gives a good understanding of some of the key challenges for growers and other players in the value chain:

- **Lack of a sustainability “mindset” of all relevant stakeholders within the agricultural business ecosystem:** Today, sustainability is very high on the agendas of agricultural businesses. Despite that, internal challenges still exist in financing sustainability-related projects, which do not focus on the main product(s) or do not have immediate return of investments. Pressures from investors or shareholders are high. Even once the leadership of a business has fully committed to a specific sustainability strategy, its success is not only dependent on a leadership decision, but on all employees. In particular those who execute or sell the sustainability project to customers need to be fully on board.
- **Increased financial risk and required upskilling:** The transition into sustainable agricultural systems requires investments at different levels. Growers cannot just change from productive systems to resource-conserving technologies, as they bear a substantial financial risk by doing so. The grower needs to invest additional time into upskilling herself and trying out new systems. She bears the potential risk of making mistakes and reducing her yield during the transition period, which can take several years.
- **Economic profitability first, sustainability second:** In the end of the growing season, the grower needs to make a stable income with her produce. Without this point being fulfilled, she will not consider implementing sustainability measures on the farm, unless external subsidies exist, or she is obliged to by local legislation.

What are possible solutions to overcome barriers?

Despite existing challenges, Tilmann Silber, Director Land and Water at the Swiss sustainability consultancy South Pole thinks that sustainability has now reached momentum. “For businesses, we need both, the internal leadership and external pressure to implement sustainability long term. The Paris agreement, the Science Based Targets initiative, civil movements, like Greta Thunberg’s, investors with sustainability agendas and critical consumers and employees are all great motivators for businesses and can help to inspire and sustain internal change”. Mr. Silber thinks that bringing the sustainability “mind-set” to every employee of a business clearly is an immense leadership challenge. “We need to touch the minds and the hearts of people to be successful.”

With projects like the “Kariba sustainable farming” project In Zimbabwe, South Pole contributes to the transformation of agriculture through building an ecologically skilled workforce. By upskilling growers on conservation farming, a sustainable land management farming system, they reduced the risks for growers in this transition and long term through building an agricultural system that is more resilient to climate change-related risks.

Ensuring the profitability of a grower is key to facilitate the transition towards sustainable agricultural systems. Indigo Agriculture is a start-up that has been listed as number 1 on the 2019 CNBC Disruptor 50 list. Innovations like their microbe-based seed help growers to maximize yields while at the same time reducing the environmental impact of agriculture through reducing water input needs. An innovation from Michael Smith focuses on improving soil health to improve soil resilience and crop yield. He developed the Green Powerhouse™, a closed-loop system that uses waste byproducts from industrial and other processes to produce organic fertilizer and nutrient-rich soil amendments.

The transformation of agriculture towards a sustainable system is a challenging task. However, the momentum for sustainable agriculture is here and many solutions already exist. Growers need to be provided the right framework and conditions to implement them and at the same time meet their bottom line.



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