Chapter 14
Digital Agriculture Strategy

ABSTRACT

The aim of this chapter is to examine strategies for digitalizing agriculture. The first part of the chapter examines strategies for digitalizing agriculture in Africa. This part begins with an analysis of the role of agriculture in Africa, and it attempts to answer the question of whether African can feed itself and the world through its own agriculture. The first part will also consider strategies for innovating and computerizing Africa's agriculture. The second part of the chapter will examine agricultural trends and strategies in the European Union. This part will focus specifically on the trends of digital-oriented and smart farm developments. The final part of the chapter will consider strategies for digitalizing agriculture in Latin America and Asia.

INTRODUCTION

In this chapter, we will address strategies for digitalizing agriculture. In the beginning of the chapter, we will deal with agricultural farms in Africa because African agriculture is highly fragmented and, to some extent, resembles agriculture in other countries.[1] This is in contrast to American agriculture, which is based on large farms (around 169 hectares) that are maximally automated and computerized. Despite this, they pollute the environment and produce unhealthy food. Smaller farms, on the other hand, usually produce healthy organic food. After discussing strategies for Africa, digital and automation strategies for European, Latino, and Asian countries will be discussed. Defining such a strategy is beneficial if it is seen in the context of other countries and their practices.

It should be noted that most countries with small farms, including Poland, could benefit from adopting the strategy discussed below in regard to Africa, tailoring this approach to their needs. Farming in Poland, for example, is highly fragmented. In 2013 there were 1,428,400 farms. Individual farms employ about 100,000 people and comprise 91% of the total agricultural area, including livestock farms. The average area of a farm in Poland is 11.54 hectares. There is also a territorial diversity of holdings. More robust fragmentation can be observed in the south and east of the country, while a higher concentration of land occurs in the northern regions.

DOI: 10.4018/978-1-7998-8036-3.ch014

As is shown in Table 1, the level of development of Polish farms is comparable to Greece, the lowest in Europe (although the table does not list all EU countries). In other words, Polish agriculture still has a lot to learn to match countries with higher levels of agriculture.

Table 1. Level of agriculture in selected countries of the European Union (2006) (Ziętara, n.d.)

Economy Level	Level of Agriculture (Size of Farm in ESU)			
	High		Low	
High	Belgium Denmark Holland France Germany U. Kingdom	97.9 101.0 137.6 74.7 90.8 111.3	Austria Finland Italy Ireland Sweden	29.4 40.4 28.9 20.7 50.7
Low	Czech Rep. Slovakia	107.7 127.0	Greece Lithuania Poland Hungary	9.4 64.7 10.2 18.2

Note: ESU = European Size Unit

The European Size Unit (ESU) is a measure of the economic size of a farm. One ESU is equivalent to 1,200 EUR of surplus of economic value, taking into account the cost of living of the farm owners.

Ziętara (n.d.) writes:

The level of GDP per capita was used as a criterion for the distribution of countries with a strong economy. In countries with a strong economy, GDP per capita was between 35,000 and 71,000 USD, while in countries with a low economy GDP per capita was in the range of 10-25 thousand USD. The data provided refer to 2005 and 2006. The level of agriculture is determined by the economic size of the holdings expressed in the ESU. Examples of countries with strong economies and high levels of agriculture are Belgium, Denmark, the Netherlands, France, Germany, and the United Kingdom. The size of the holdings in these countries was between 75 and 140 ESU. In countries with strong economies and low levels of agriculture, the size of farms was between 20 and 50 ESU. Examples of such countries are Austria, Finland, Italy, Ireland, and Sweden. The Czech Republic and Slovakia are examples of countries with low economic levels and high levels of agriculture. The last group is countries with low economic levels and low levels of agriculture. Examples are Greece, Lithuania, Poland, and Hungary. Lithuania stands out from this group, where the holdings represented in the FADN system were characterized by a slightly larger economic size of holdings, which entails maintaining a significant share of large-scale farms established based on former production cooperatives and state-owned enterprises in agriculture.

THE ROLE OF AGRICULTURE IN AFRICA

For the last 6,000 years of civilization's development, agriculture has been humanity's primary activity in the pursuit of poverty reduction and sustainable development. In the 21st century, agriculture remains