Chapter 12
Turning the Table(t)s?
Opportunities for Widespread Adoption of ICTs in Agriculture

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ABSTRACT

Agriculture, one of the users and also the basis of major rural resources, has undergone a change in the last couple of decades: the industrial revolution made its mark in the early 20th century and then the information age began to shape agricultural production and the way farming is done today. This process presents an enormous challenge for the stakeholders in agriculture, especially for smallholder farmers and family farms that play a crucial role in the sustainable use of rural resources. The new information and communication tools and services are both an opportunity and a risk: the adoption of these innovations is a must in order to act in a globalised and standardised context and to manage even a small farm, but the adaptation process is slow, which hampers the chances of e-innovations in a rural context. This chapter examines the causes behind the changes in agriculture and concludes with the opportunity of widespread use of e-innovations.

CHANGING TIMES: AGRICULTURE IN THE INFORMATION AGE

The Social History Aspect

The world and society have changed radically in the last 150 years in the ‘developed’ world. The industrial revolution followed by the so-called information revolution affected every aspect of our lives and agriculture (and rural areas) is no exception to this. From agricultural societies, where agriculture was the basis of every economical activity, we emerged into the information society – and agriculture became just one of the sectors heavily affected by the fundamental structural changes of the transition process. Many historians and social scientists have described the changes (e.g. Toffler, Bell, Castells) and their messages overlap one another.

In his book The Third Wave, Alvin Toffler (1980) describes three different kinds of societies, based on the symbolic concept of ‘waves’. Every wave represents a completely new level and replaces the older societies. The first wave is the agricultural society that followed the hunter-gatherer cultures, while the second wave is the
industrial age society, which began in Western Europe with the industrial revolution and quickly spread across the world. According to Toffler, the main characteristics are the following:

The Second Wave Society is industrial and based on mass production, mass distribution, mass consumption, mass education, mass media, mass recreation, mass entertainment, and weapons of mass destruction. You combine those things with standardization, centralization, concentration, and synchronization, and you wind up with a style of organization we call bureaucracy.

The third wave is the post-industrial society, which began in the 1950s. One of the chief aspects of this wave is the fact that knowledge and information are the primary determinant of power and its distribution. Manufacturing are overshadowed by knowledge-production and information processing as the latter became the primary economic activity. The most important message of this work is that the nature of society (and all the relationships between the different parts of it) is heavily impacted by the new information, and that communications technologies, structures and procedures are modified to serve technology.

Toffler uses a good collection of words to name the third wave, for example the “Information Age.” It is close to the term “post-industrial society” originating from Daniel Bell. In his book The Coming of Post-Industrial Society: A Venture in Social Forecasting (1973), Bell describes a new kind of society and calls it the post-industrial society. He divides human history up into three different stages in which pre-industrial and industrial societies are the antecedents of the post-industrial society. Similarly to Toffler, the main points of Bell’s characterisation are that the new type of society will replace the industrial society and it will be lead by information and be service-oriented. It would mean the decline of manufacturing activities and the growing importance of science based industries.

In order to explain what the driving force is behind those changes we need to turn to James Beniger. Beniger (1986) says that the industrial revolution generated a crisis of control in manufacturing and transportation and the response to this crisis is another revolution, a revolution in societal control. In the beginning (in the late 19th century), bureaucracy was the main tool for this control-process but in the second half of the 20th century, computer technology came into force.

“Because both the activities of information processing and communication are inseparable components of the control function, a society’s ability to maintain control—at all levels from interpersonal to international relations—will be directly proportional to the development of its information technologies.” Control technologies make possible bigger production, distribution, and consumption of goods and services. Beniger also mentions Weber and rationalisation as another control method, because “…control can be increased not only by increasing the capability to process information but also by decreasing the amount of information to be processed.” The control revolution leads us to the information society that can also be interpreted as a “hyper-industrial” society (Fuchs, 2009), because the fundamental logic behind the production and distribution of goods has not changed. This point draws our attention to the fact that agriculture and industry are not disappearing but rather changing in a way the new logic requires.

Beniger used employment statistics in the various sectors of the economy (Figure 1.) to point out the changes. It can be seen that agriculture, which was once dominant, became marginal over a period of 200 years and that information - and service-related jobs - took over in the last century. Since the 1950s there was a sharp decline in the number of industrial workers in the USA.

Probably the most famous, Manuel Castells, also examined structural changes to the global economy from the 1970s to 1990s. He describes the “new economy” whose main feature is “a new
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