

ARE THE INHERENT LIMITS IN THE PROCESS OF INDUSTRIALIZATION?

A STUDY ON THE SEED SECTOR IN THE U.S. AND IN GERMANY

The description of industrialization as an inexorably ongoing process is one of the basic narrations in sociological theory. The two major theoretical traditions of our discipline, the modernization theory approaches in the tradition of Max Weber, as well as Marxist perspectives, assume a continuously increasing specialization, standardization and rationalization of the production process. Marxist concepts emphasize that industrialization is accompanied by the process of commercialization. Commons or goods with undefined property rights are transformed into private goods. In a historical perspective both trends took place neither linear nor parallel; instead their enforcement was characterized by many discontinuities. Also the economic historian Karl Polanyi (1995) describes the emergence of capitalist societies as a process, in which markets for the “fictitious commodities” – labor, land and money – were created. Following Polanyi, the establishment of modern societies is based on the expansion of the market logic into more and more social subareas - goods are transformed into commodities which are ubiquitously available. The empirical implication of this perspective is the postulation of an increasing marginalization of small-scale and decentralized forms of production and on the other hand, the privilege of standardized, globally organized forms of mass production in privately owned companies.

Contrary to this linear narrative, I will develop a concept which addresses the immanent limits of industrialization. By using the example of agricultural production I will show that the production in the primary sector is faced with obstacles and resistances, which are not only partial or temporary, but they arise from the specific context of agriculture. The notion of immanent limits should not imply that these problems arise purely from a physical logic. On the contrary, the agricultural sector is tightly interwoven with the power relations and the cultural background of the society (Morgan / Marsden / Murdoch 2006; Barlösius 1995) Therefore is the process whether the occurring obstacles become socially relevant (or not) highly shaped by political institutions.

More specifically I will use the example of the seed sector, because this particular industry is a very illustrative example for the technological, economical or cultural limits of industrialization. These obstacles and resistances, on the other hand open up space for the development of an ecological agriculture. The development of seeds is essential for a sustainable and socially adapted type of agriculture. This relationship has been widely discussed and is usually invoked by natural scientists. In contrast, a social science perspective on the connection between plant breeding research and agricultural production allows a broader perspective. I will develop a concept in order to explore how the obstacles towards the industrialization of seed production and plant breeding have effects

on the type of agricultural production. The industrialization of seed development/production is characterized by the application of technology, the division of labor in the breeding process as well as the standardization and mass production of the developed plant varieties (Brandl 2012).

Therefore I compare different seed regimes which show varying levels of industrialization - the United States and Germany. Empirically my analysis is based on a mixed methods approach. On the one hand I use a qualitative approach to get a better understanding of the seed sector. Therefore I have conducted qualitative, guideline based interviews with breeders, scientists at universities, employees of seed companies and members of governmental authorities in both countries. On the other hand my concept is based on the quantities analyses of FAO data about the development of yield and the harvested area of different crops in both countries from 1961 to 2013. In order to develop a better understanding of the arising resistances against the process of industrialization, I suggest a typology which contains three types of barriers against the process of industrialization of seed development.

Epistemic or physical barriers

Plant breeding for agro-industrial contexts faces the challenge to transform complex living organisms. Here the problem arises that plants are not as easy to transform as dead matter. However, not all crops are complex in the same way. The specificities of the different types of crops, e.g. their different modes of reproduction, entail highly different costs, which incur in the breeding process. This implies that the biological characteristics of the respective crop influence the efforts which are made by the seed companies. Wheat and sorghum may be important for the human nutrition, for breeding companies are these crops in terms of economic benefits not especially interesting.

Economic barriers

Another obstacle in the industrial production of seeds is the strong segmentation of the market. Unlike other agricultural input factors, seed must be adapted to the local conditions, such as climate, soil or the average length of the day. Caused by this dependency of the local conditions, the target market for seed is always more limited than the market for other agricultural input factors. Globally less than 3 percent of the world's varieties are cultivated outside their home continent (Franck 2007). The segmentation of the market is not only caused by the region, but also by the fundamental difference of the cultivated crops. The seed markets of a different crops work are following completely different market logics. The varying logics arise e.g. through the different types of processing of the crops. There is a big difference between the cultivation of feed or food crops, between selling the harvested cotton to global companies or growing the preferred barley variety of the local brewery.

Cultural barriers

In addition to the epistemic and economic barriers, which occur more on the production side, there are also barriers arising on the consumption side. These

obstacles for industrialized forms of seed production have their origins mainly in the various traditions of the food cultures. Basically, the difference was articulated in the historically developed contrast between Catholic sensuality and Protestant asceticism. In northern Europe and the United States, currently this contrast is continuing as social distinction between the Slow Food movement, with its focus on culinary diversity and stylized traditions, and the supporters of a fast, easy to prepare and inexpensive diet (Gill u. a. 2012).

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