

INTRODUCTION TO FARMING SYSTEMS ANALYSIS

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The Notion of Farming System: A Concept Revived

The expression “*farming system*” indicates that the scope of study encompasses farms’ structure, organization and operations. The aim is to understand what farmers do, how they do it, and why they do it (How do they combine several activities and farm practices on their farms? What is the reasoning behind their practices? What technical and financial constraints do they face?), and assess the results they attain (technical performance and economic outcomes). The aim is also to formulate hypotheses on how farms may evolve in the near future, and identify and prioritize the problems farmers encounter so as to shed light on the conditions under which they could modify their practices¹.

First, the relevant scale of analysis for the farming system concept is generally the smallholder farm. This production unit is characterized by a certain number of resources: farmed land (surface area, location within the cultivated ecosystem, environmental conditions, soils, microclimate, slope, drainage, access to water, etc.), labour (amount, nature, training, access to information, etc.), and farm capital (buildings, equipment, plantations, reproductive livestock, etc.). However, applying this concept to each farm individually runs the risk of defining a farming system for each individual farm. Instead, we shall apply the concept to a set of farms that have access to comparable resources (same type of location, and same approximate size, amount of equipment and labour), face similar socioeconomic conditions, and produce a given combination of crops—in short a group of farms that can be represented by the same *model*.

A production unit’s resources are mobilized and combined in a given way within the farming system. Understanding of how the farming system operates and is organized can be attained thanks to the concepts of cropping system and stock farming system. Here, the farming system is seen as an organized combination of various cropping and livestock rearing systems. We shall see that the aim is, first, to understand how each of these formative sub-systems operate and then clarify the relationships between these systems.

Outside aspects linked to the farms’ “*socioeconomic environment*” also help explain farmers’ choices and practices: resource access conditions (the mode of access to land, the labour market, credit, etc.) and conditions for obtaining public subsidies, relationships with the upstream segments (input supply conditions, for example) and downstream segments (production conditions: specifications, product sale conditions such as seasonal prices, quality bonuses, regularity, volumes, etc.) of the production chain.

When pluriactivity is prevalent, the relationships that emerge between the agricultural farming system and the activity system as a whole need to be analyzed and understood, both in regard to labour distribution (competition or synergy) and in terms of access to and use of capital. In any case, we feel it is important to begin the study of the activity system with a study of the agricultural farming system—which is often the

¹ Devienne and Wybrecht, 2002 : “Analyser le fonctionnement d’une exploitation.” In *Mémento de l’agronome*. Paris: CIRAD – GRET – Ministry of Foreign Affairs, 2002; 345-372.

most complex system, requiring know-how in many areas and often characterized by an equally complex work schedule.

Accompanied by a specific set of production means and a specific workforce, a farming system therefore presents itself as a *specific combination* of various cropping systems and various livestock rearing systems. Understanding of how the farming system operates begins with an understanding of each of its formative sub-systems. This understanding continues with an analysis of the logic behind how the combination of sub-systems operates, which in turn contributes to an understanding of each of the cropping and livestock rearing systems. Analyzing the overall operation of the farming system consists of revealing complementary or competition in regard to resource allocation, notably by identifying difficult periods by drawing up the various calendars: labour needs, fodder needs and availability, cash-flow, etc...². In this way, comparing the work schedule for the most restrictive period, the number of available days (in function of soil and climate conditions), and the available equipment and labour resources allows one to identify the system's upper technical limit—that is to say, the maximum number of hectares or animals that one worker can farm with the available resources and in function of the combination practiced.

² Devienne and Wybrecht, 2002, op. cit.