

Social indicators for the sustainability assessment of the MilKey project



Description of the selected indicators and methodological choices
for the social sustainability assessment of MilKey dairy farm systems
WP4

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Introduction

This document describes the indicators selected to assess the sustainability of key EU dairy farm systems as part of the MilKey sustainability assessment (i.e., work package (WP) 4). The selection process was based on expert opinion of WP4 partners and followed an interdisciplinary, participatory approach. This assessment covers the three sustainability dimensions, i.e., environmental, social, and economic, and is performed using the “DEX” multi-criteria methodology. This methodology provides the possibility to break down a decisional problem into smaller, less complex sub-problems represented by criteria. All the criteria are arranged hierarchically so those at higher levels depend on those at lower levels (Craheix et al., 2015).

At the lowest level of the arrangement, the last criteria are called “indicators”. These indicators can be calculated using the required parameters. Then, they are aggregated to their corresponding levels (criteria). The indicators have different weights on their higher level depending on the importance that is given to the indicator in the criteria definition.

Drawing upon the Dexi method, a model is developed to evaluate sustainability through aggregated and qualitative scores of dairy farms through a Greenhouse Gases (GHG) mitigation perspective. For each sustainability indicator, qualitative scores are assigned on rating scales constructed using reference values. Then, the indicators are aggregated to their corresponding higher levels into another qualitative score by using weight for each indicator.

The current document gathers the list of indicators with their definitions and formulas, as well as reference values of their rating scales. It is normally divided into three sections for each sustainability dimension, but this document only presents the environmental dimension. Some indicators appear twice because they have been selected in two different branches (one branch per sustainability dimension). Please note that this document aims merely at presenting the indicators and does not display detailed calculations nor data requirements.

Social Indicators

This section presents the indicators related to the social sustainability assessment. These are presented in table 1 and figure 1.

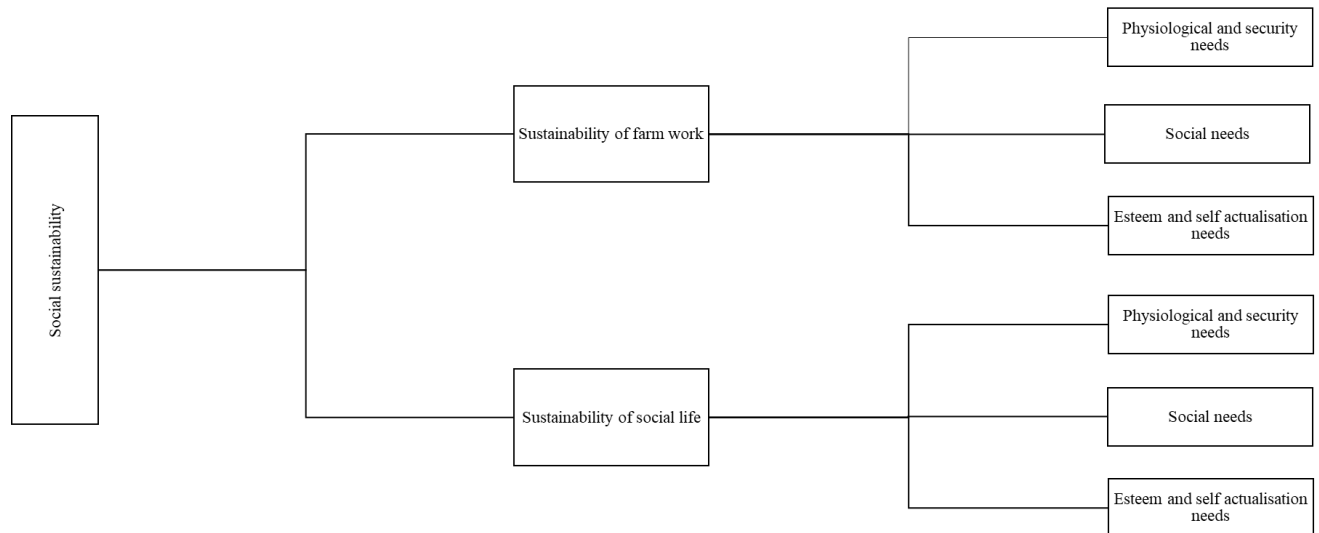


Figure 1

We structure our approach as follows: Based on Parsons' (Turner, 1991) social system of change we combine the notions of agricultural systems and social systems in order to identify the aspects that are important for the social dimension of sustainability in agriculture.

Parsons' social system of change is especially appropriate for this purpose as it allows for conceiving of both individual and collective action and interaction and making the institutional backgrounds of social interaction visible. Secondly, we argue that the social sustainability of a system is determined by the extent to which needs and rights are fulfilled. Consequently, we integrate the needs concept introduced by Maslow (1943) and the (human) rights approach (Gasper, 2007) into our framework of social sustainability in agriculture. The strength of these concepts is that they both define the individual preconditions for overall societal well-being and thus allow to connect the societal with the individual sustainability level. Needs and rights are also consistent with the most accepted definition of sustainable development as “development that has to meet the needs of present and future generations” (Brundtland, 1987, p. 24) by the World Commission on the Environment and Development.

1. Sustainability of farm work		
1.1. Physiological and security needs index		
1.1.1. Sustainability of physical health needs		
Extent of agreement to the following statement	Likert scale	
a. Working on my farm is straining for my physical health.	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree	1 2 3 4 5
b. Working on my farm often involves dangerous work situations.	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree	1 2 3 4 5
1.1.2. Sustainability of security needs		
Extent of agreement to the following statements:	Likert scale	
a. I feel the financial performance of my farm is good enough, that I don't have to be worried about the economy.	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree	5 4 3 2 1
b. As a farmer I experience that both the farm workers here and I have satisfying social welfare and security arrangements.	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree	5 4 3 2 1
c. In case of an illness or injury to me, I am confident that I have people who will help me with the farm work.	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree	5 4 3 2 1

1.2. Social needs index		
1.2.1. Sustainability in social interaction		
Extent of agreement to the following statement	Likert scale	
a. I have satisfactory social interaction with colleagues and friends in agriculture	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree	5 4 3 2 1
b. I often feel lonely in my daily work on the farm.	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree	1 2 3 4 5
c. I'm not worried about what will happen to the farm when I stop running it.	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree	5 4 3 2 1
1.3. Esteem and self-actualization needs index		
1.3.1. sustainability in personal development		
Extent of agreement to the following statement	Likert scale	
a. Farm work is rewarding and gives me opportunities to realize my full potential as a person.	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree	5 4 3 2 1
b. I feel that the agricultural policy and /or the market forces has made me run the farm in a way that I do not like	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree	1 2 3 4 5
1.3.2. sustainability in visions		
Extent of agreement to the following statement	Likert scale	
a. I'm confident to further invest time and/or money in the future for my farm.	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree	5 4 3 2 1
b. I am optimistic about the future of agriculture in my country.	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree	5 4 3 2

	5 = Strongly agree	1
1.3.3. sustainability in esteem		
Extent of agreement to the following statement	Likert scale	
a. I feel that the work done by farmers is appreciated by society.	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree	5 4 3 2 1
b. I am proud to be a farmer.	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree	5 4 3 2 1

2. Sustainability of social life		
2.1. Physiological and security needs index		
2.1.1. Sustainability of physical health needs		
Extent of agreement to the following statement		
a. I feel I have both the time and the opportunities to take care of my physiological health in my spare time.	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree	5 4 3 2 1
b. Our household finances (farm income and non-farm income for all household members) are of a level to make us feel financially secure.	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree	5 4 3 2 1
c. I feel that my family and I have satisfactory access to everyday commodities and public services such as grocery, post, bank, education, and health care etc.	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree	5 4 3 2 1
2.2. Social needs index	(a + b + c + d)/4	B
2.2.1. Sustainability of social interaction		
Extent of agreement to the following statement		
a. I feel I have the time and opportunities to spend time with my friends and family.	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree	5 4 3 2 1
b. I often feel lonely in my free time.	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree	1 2 3 4 5
c. I feel that I manage to spend quality time with my children, my family and friends in a satisfactory way without it coming into conflict with my tasks as a farmer.	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree	5 4 3 2 1
d. I am concerned that some of my immediate family members may feel lonely and socially isolated.	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree	1 2 3 4 5

2.3. Esteem and self-actualisation needs		
2.3.1. sustainability in self-actualisation		
Extent of agreement to the following statements:		
a. I feel that my duties and tasks on the farm hinder me in realizing my own wants and interests outside farming.	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree	1 2 3 4 5
b. I feel I am able to realize my dreams and visions for the life I want to live next to being a farmer.	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree	5 4 3 2 1

3. Strategies for sustainable integration of agricultural and social system (not in the DEXi)		
3.1. Strategies for physiological and security needs index		
3.1.1. Strategies for physical health needs		
Extent of agreement to the following statement		
a. Making changes to my farm operation that reduce the physical strain or health impact of working on the farm is important to me	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree	5 4 3 2 1
b. I always remind myself, my family and my employees to have regular health check-ups (e.g. annual medical exam).	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree	5 4 3 2 1
3.1.2. Strategies for security	(a + b)	Y
Extent of agreement to the following statement		
a. I have completed courses and / or received advice to make the farm a safer workplace for myself, my workers and family members.	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree	5 4 3 2 1
b. I always make sure to set aside a portion of my annual income for unexpected expenses.	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree	5 4 3 2 1
3.2. Strategies for social needs index		
3.2.1. Strategies for friends and friendship		
Extent of agreement to the following statement		
a. Even during the busiest periods on the farm, I still prioritize time to spend with friends and family	1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree	5 4 3 2 1
b. It is important to arrange farming related gatherings and meetings to create arenas for farmers to socialise	1 = Strongly disagree 2 = Disagree	5 4

	3 = Neutral	3
	4 = Agree	2
	5 = Strongly agree	1
c. I always make sure to attend/spend time at local social and cultural events in order to maintain contact with people in the local community.	1 = Strongly disagree	5
	2 = Disagree	4
	3 = Neutral	3
	4 = Agree	2
	5 = Strongly agree	1
3.3. Strategies for esteem and self-actualisation index		
3.3.1. sustainability in esteem and self-actualisation		
Extent of agreement to the following statements:		
a. When making decisions about my farm I believe it is important that the decisions taken are consistent with my values	1 = Strongly disagree	5
	2 = Disagree	4
	3 = Neutral	3
	4 = Agree	2
	5 = Strongly agree	1
b. I'm involved in activities that present agriculture in a positive way to the wider society	1 = Strongly disagree	5
	2 = Disagree	4
	3 = Neutral	3
	4 = Agree	2
	5 = Strongly agree	1

4. Interpretation of results

The interpretation of the results for each of the nine indices is follows:

Score	Interpretation
1	The sustainability is good.
2-3	There is significant potential to improve sustainability.
4-5	The sustainability is not good.

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- Brundtland, G. H. (1987). *Our common future*. Oxford University Press.
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