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Sustainable production and consumption: the role of the agents involved in family farming

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Abstract

Family farming is an activity that goes beyond production to involve the distribution, marketing, and food consumption. It is important to recognize the roles of agents who contribute to the success of the activity but are not always seen as part of the process. This research aims to discuss the roles of agents involved in family farming from the perspective of the Sustainable Development Goals (SDGs) of the United Nations, considering social, environmental, and economic factors. Qualitative research was carried out based on semi-structured in-depth and focus group interviews. The research involved 62 family agriculture agents in 16 municipalities in the state of Rio Grande do Sul, southern Brazil. Data are presented from content analysis and descriptive statistics. The results pointed out the main roles of the agents: producing food, feeding the population, and continuing agricultural activities. The activities performed by the agents can be categorized into planning, process, and monitoring. Planning was considered the most important aspect of family farming activities, in addition to the implementation of SDG 12, which addresses sustainable production and consumption.

Keywords: *Sustainability; Production; Consumption; Planning; Sustainable Development*

Produção e consumo sustentável: o papel dos agentes envolvidos na agricultura familiar

Resumo

A agricultura familiar é uma atividade que vai além da produção para envolver a distribuição, comercialização e consumo de alimentos. É importante reconhecer os papéis dos agentes que contribuem para o sucesso da atividade, mas nem sempre são vistos como parte do processo. Esta pesquisa tem como objetivo discutir os papéis dos agentes envolvidos na agricultura familiar sob a ótica dos Objetivos de Desenvolvimento Sustentável (ODS) das Nações Unidas, levando em consideração os fatores sociais, ambientais e econômicos. A pesquisa qualitativa foi realizada com base em entrevistas semiestruturadas em profundidade e grupos focais. A pesquisa envolveu 62 agentes da agricultura familiar em 16 municípios do estado do Rio Grande do Sul, sul do Brasil. Os dados são apresentados a partir de análise de conteúdo e estatística descritiva. Os resultados apontaram os principais papéis dos agentes: produzir alimentos, alimentar a população e dar continuidade às atividades agrícolas. As atividades realizadas pelos agentes podem ser categorizadas em planejamento, processo e monitoramento. O planejamento foi considerado o aspecto mais importante das atividades da agricultura familiar, além da implementação do ODS 12, que aborda a produção e o consumo sustentáveis.

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1 Introduction

The increase in the world's human population, the rise in environmental degradation and the uncontrolled use of natural resources are causing growing concern about the sustainability of the planet (ADAMS et al., 2015). According to the United Nations, the world's population will reach nine billion inhabitants in the coming years. Under these circumstances, the planet will need 50% more food, 45% energy and 30% more water (UN, 2015). Such demands represent a global challenge and call for a severe reduction in the unsustainable use of natural resources.

Sustainable agriculture is essential for the health of the planet (Sarkar et al., 2020), but it is a challenging issue. Although advances have been made, more efforts are needed toward developing environmentally-friendly practices in agriculture and food production, reducing production costs and environmental impacts (Liebman, 1992), and enhancing social aspects. Given these requirements, family farming is of particular interest. The production from the family labour force contributes to the support of the family, the income of producers and the permanence of the field (BRANDLI et al., 2019).

Family farming accounts for approximately 70% of food production in Brazil, in which 15 million people engage in agricultural activities across 351 million hectares, in agricultural establishments (IBGE, 2017), attributing income, employment and providing opportunities for producers in the field. Of these, 81% are men and 15% have never attended school, according to the 2017 Agricultural Census of the Brazilian Institute of Geography and Statistics (IBGE).

Most of the food consumed in Brazil originates with family farmers (Castro, 2017); however, there are factors that adversely affect the activity, such as gender bias, the aging of the active rural population and the lack of rural family successors. Therefore, the importance of social and economic planning regarding the future of rural family organizations must be emphasized (ALSOS, LJUNGGREN, & PETTERSEN, 2003; VIK & MCELWEE, 2011; DUESBERG, BOGUE, & RENWICK, 2017). There is also a need for greater appreciation of women's work in the field (SOTTOMAYOR, TRANTER, & COSTA, 2011).

In addition to these factors, there are sustainability issues related to family agriculture: that is, the challenge of producing and growing while also considering social, economic and environmental aspects. Agricultural properties are considered an important asset in family farming and their maintenance depends on improvements in the welfare of farmers. Increasing

sustainable development policies can contribute to the maintenance of family farmers on their properties. To do so, it is necessary to increase investment in people and to modernise agricultural production systems (MOEIS et al., 2020).

In 2015, the UN launched their Sustainable Development Goals (SDGs), a set of 17 objectives, 169 targets and 231 indicators that constitutes one of the most important political pacts for the sustainable advancement of nations. The agreement, signed by 193 UN member countries, committed to creating alternatives and implementing actions to achieve the proposed goals at local, regional or global levels. These countries also agreed to adopt transformative measures to promote sustainable development by 2030, working on crucial issues such as water, food, energy, health, education, and poverty (UN, 2015).

When considering family farming activities in relation to the SDGs, the importance that rural producers and other agents involved can present is clear. While they are producing and marketing, in addition to earning income and sustenance, they must also explore natural resources and maintain quality of life in the agricultural field. Several agents can be highlighted: family farmers, consumers, young people from the countryside, women farmers, representatives of agriculture departments, Emater, Brazilian Agricultural Research Corporation (Embrapa), labour unions, grain, milk, and credit cooperatives, distribution channels, agro-industries, and urban farmers.

The roles of family farming agents are exercised in various ways, and are related to the SDGs in many ways, mainly SDG 12: sustainable production and consumption. Just as these roles cover production issues, distribution (commercialization) and consumption, they also include the planning of the activity, the process, and its monitoring. Answers to the questions are sought: Is there a difference between the agents' discourse about their roles? Depending on the agents' role in family farming, can their way of contributing to the SDGs change? To recognize any potential differences, is important to acknowledge the role of those agents who contribute to the success of the activity but are not always seen as participants in the process. Therefore, this research aims to discuss the roles of agents involved in family farming from the perspective of the SDGs of the United Nations, taking into account social, environmental, and economic factors.

The SDGs challenge agents to rethink society's traditional models aimed at achieving food security, imagine how the multifunctionality of the landscape can be maintained, and carry these new ideas out. In this sense, breaking with old business concepts can be a new path toward a more equitable distribution of sustainable benefits (DUNCAN et al., 2021).

2 Method

This is a qualitative, cross-sectional study, conducted across 16 municipalities in the state of Rio Grande do Sul (RS), in southern Brazil, where family farming is one of the main sources of income. The 16 participating municipalities have areas between 126.1 km² (Santo Antônio do Palma) and 783.4 km² (Passo Fundo), and estimated populations (2020) of between 1,626 inhabitants (Gentil) and 204,722 (Passo Fundo) (IBGE, 2010). Through interviews and focus groups, 62 people who were involved in some way with the practice of family farming were approached; for the purposes of the study, these people are called agents. Most common among the agents were those of the male sex (55%, n=34) aged between 36 and 45 years (42%, n = 26). As regards profession, most of the agents were farmers (56%, n=35) and had a third degree as their level of education (47%, n=28).

The primary data collection instruments were a semi-structured in-depth interview script and four focus groups. The interview script was composed of 10 questions organized in a block, which had been submitted to five experts in the area for them to identify possible adjustments. This script addressed issues related to the roles played by the participants and their activity, function, current situation, challenges and expectations. It also sought to identify their possible contributions to production, distribution (marketing) and more sustainable consumption in family agriculture. The same script was used to obtain data from the four focus groups. The interviews were applied to 23 types of agents distributed across the 16 municipalities.

The focus groups were carried out at four times, in four distinct groups, with a duration of 40 minutes to 1 hour and 15 minutes and the participation of five to 14 agents per group: a) farm women, b) young farmers, c) agribusiness managers, and d) family farmers (LERVOLINO & PELICIONE, 2001; ASCHIDAMINI & SAUPE, 2004; TRAD, 2009; MASADEH et al., 2016). The women's focus group was held in a community in the interior of the municipality of Marau; the family farmers was held in a school in the interior of the municipality of Pontão; the agribusiness managers' was in a college classroom; and the young farmers' group was at a university in northern Rio Grande do Sul. Through the focus groups, collective information with individuals selected to integrate a group enabling knowledge (MORGAN, 1996).

The data collection process began with direct contact with the participating agents via e-mail and telephone. The researchers, considering 16 municipalities in the region, performed the selection. Focus groups and interviews were scheduled according to the availability for dates and times of the participants. Approximately one-hour focus groups and 40-minute interviews were

performed. The contents obtained through the interviews and focus groups were transcribed, preserving expressions and details mentioned by the interviewees, which resulted in 76 pages. These were interpreted using content analysis (Bardin, 2011), first with a full reading of the transcribed material and afterward with the definition of the codifications and enumeration of the units of record, units of context and frequency.

Content analysis unfolds in qualitative stages so that the researcher can choose counting rules by means of quantitative indexes. To perform this procedure, the Maxqda 10 software was used. The Consolidated Criteria for Reporting Qualitative Research (Coreq) was adopted, aiming to enhance the quality of the qualitative research by giving it greater recognition and scientific effort (TONG, SAINSBURY & CRAIG, 2007). Descriptive statistics were used to profile the participants with the help of IBM SPSS Statistic 26.

3 Results and discussion

3.1 identification of the roles of agents in family farming

Through studying the interviews and focus groups, we identified 51 roles in family farming (Table 1), considering different areas such as production, distribution, marketing, support and consumption. These roles are identified through the operationalization of each stage of family farming, who operates and how they operate, as well as what the study considers being the phases of the activity (planning, process and monitoring), manifesting which phase is the most required. It must be acknowledged that there is a complex range of relationships in family farming, and therefore an adequate understanding of the relationships between the agents involved is needed (Vaccaro et al., 2018), whether in planning, in the process or in monitoring the activity.

The categories were classified a posteriori by importance and three aspects of family farming were considered: planning (initial phase); process (execution phase); and monitoring (final phase). The categorization made it possible to evaluate the management of farming activities while taking into account the guiding aspects.

Table 1 - Relationship between the Roles of Agents and the SDGs

Registration Unit (51)	N	SDG	Categories
Produce food	22	SDG 1	Process
Feed the population	17	SDG 1	Process
Continue agricultural activities	15	SDG 1	Process
Consume the local product	11	SDG 12	Process
Add value through processed foods	8	SDG 12	Process
Increase family income	8	SDG 12	Monitoring
Encourage rural succession	8	SDG 12	Planning
Create strengthened distribution channels	7	SDG 12	Monitoring
Provide quality of life	7	SDG 3	Monitoring
Value the role of women	7	SDG 5	Planning
Create practical projects for the field	6	SDG 12	Planning
Promote production	6	SDG 12	Planning
Encourage family farming research	5	SDG 2	Planning
Foster agroecology studies	5	SDG 12	Planning
Provide technical assistance to farmers	5	SDG 2	Planning
Reduce the rural exodus	5	SDG 12	Planning
Diversify production	5	SDG 12	Planning
Value acquired capital	5	SDG 2	Monitoring
Seek technology and innovation	5	SDG 9	Planning
Take care of the land and waters	4	SDG 15	Monitoring
Expand productive capacity	4	SDG 1	Planning
Avoid food waste	4	SDG 12	Planning
Create public policies	3	SDG 1	Planning
Raise community awareness about sustainability	3	SDG 2	Planning
Foster local development	3	SDG 12	Monitoring
Create a strategy to help rural people	3	SDG 2	Planning
Promote rural credit	3	SDG 2	Monitoring
Prepare people to manage property	3	SDG 2	Planning
Guide farmers	3	SDG 2	Planning
Create urban gardens	3	SDG 12	Process
Decentralize income (man)	2	SDG 8	Planning
Develop economic and social growth in the region	2	SDG 12	Monitoring
Produce and consume agroecologically	2	SDG 2	Process
Offer financial solutions to members	2	SDG 2	Planning
Empower farm labourers	2	SDG 2	Planning
Promote product certification	2	SDG 12	Monitoring
Support agroindustries, the Food Acquisition Program (PAA) and the National School Feeding Program (PNAE)	2	SDG 12	Monitoring
Improve access to properties	2	SDG 9	Monitoring
Encourage production by providing implements	2	SDG 17	Monitoring
Inspect animal products	2	SDG 12	Process
Contribute to food distribution	2	SDG 12	Monitoring
Conserve family traditions	2	SDG 10	Monitoring
Contribute to food security	2	SDG 1	Monitoring
Consume products with known origins	2	SDG 12	Monitoring
Create sustainable behaviour	2	SDG 12	Planning
Boost the country's economy	2	SDG 8	Monitoring
Avoid middlemen	2	SDG 12	Planning
Exchange knowledge and experience	2	SDG 4	Monitoring
Reduce environmental impact	2	SDG 15	Monitoring
Care for the soil and value biodiversity	2	SDG 15	Planning
Promote public-private partnerships	2	SDG17	Planning

Source: Authors, 2022

Important aspects of the information in Table 1 were analysed, such as the frequency of the categories, which were divided into planning (nº = 24), index = 47%; process (nº = 8), index = 16%; and monitoring (nº = 19), index = 37%. The analysis identify the roles (codes) most frequently mentioned by the participants, and to categorize these findings according to the phases of family farming activities. In summary, the main roles cited by the agents were "producing food", "feeding the population" and "continuing agricultural activities".

The context of these statements can be verified through the testimonies:

- "The role of the family farmer —not only the family farmer, but of every farmer— is to produce food and feed the population by taking care of the land" (58 years old, 4th grade graduate, farmer);
- "(...) we, as the Landless Movement, want to produce sustainable food, free from poisons, free from transgenics, (...) for us and for those who consume it as well" (64 years old, college graduate, postgraduate, farmer and teacher in the Landless Rural Workers Movement – MST);
- "The role of agribusiness and family farming is to feed the world" (42 years old, agribusiness manager); and,
- "The role of young people in agriculture is to continue the investments of our parents and grandparents, that is, to continue work in the production of food and pass on to our children the importance of this cycle, and of the love for the land" (28 years old, technician in agriculture and farmer).

The characteristics (categories) of the roles of the agents involved are shown to be significant, with a frequency of 47% (n=24) for planning activities, 37% (n=19) for monitoring and 16% (n=8) for the process. Nevertheless, the remarkable necessity of planning in all agricultural activities, whether urban or rural, has become clear. Some examples of actions that could contribute to the success of family farming are encouraging succession, valuing rural women, and creating practical projects that help to promote production. The planning of activities, as well as the creation of programs and the use of land, are favourable occurrences that contribute to partnerships between the public and private sectors, institutions and agents of family agriculture involved.

Cities must likewise strive to understand the concerns and planning methods for global food security, as they are also responsible for feeding their populations in a sustainable way. Through urban planning practices, production can be made more effective and benefit the population and the environment. Cities in the process of urbanization face the threats of both food insecurity and land scarcity. However, through land use planning, they can be an important

source of food for future urban populations (DIEHL et al., 2020). Crop diversification has also been fundamental in planning resilience strategies and fostering the maintenance of a varied agrarian structure.

Sustainability is one of the most important factors in formulating policies, planning family farming and developing programs that bring social, economic and environmental benefits to the agents involved (ASIMEH et al., 2020). Alongside this reality, it appears that planning can also be important for socioeconomic elements in search of food certification, value addition and contribution to the SDGs (DEFRIES et al., 2017).

Planning in family farming brings numerous benefits: for example, higher income with a new crop model, as occurred in one region of China, where more than one method of harvesting food is used in order to maximize the producer's profits. This production planning encompasses the harvesting of green products with lower operating costs but a long delivery time, as well as harvesting mature crops with higher operating costs but more rapid turnover (LI et al., 2019).

Another example is of small farmers in Ghana, West Africa, who suffer from gender inequality, including lack of financial resources and lack of access to work among women. Health is precarious, making the mitigation of climate change difficult. Thus, a critical look at the planning needed to address climate change helped with the formation of resilient agricultural families, capable of managing their properties (ASSAN et al., 2020).

In addition to planning, the process and monitoring of activities become effective with a good social, environmental and economic structure, which favours producers, traders and consumers. In this sense, planning the succession process and the continuity of rural activities is necessary, as this is something, which is not usually done (BURTON & FISCHER, 2015). The changes that have occurred in agricultural activities, such as land abandonment, change in use and loss of biodiversity, are irreversible (BLANCO et al., 2013).

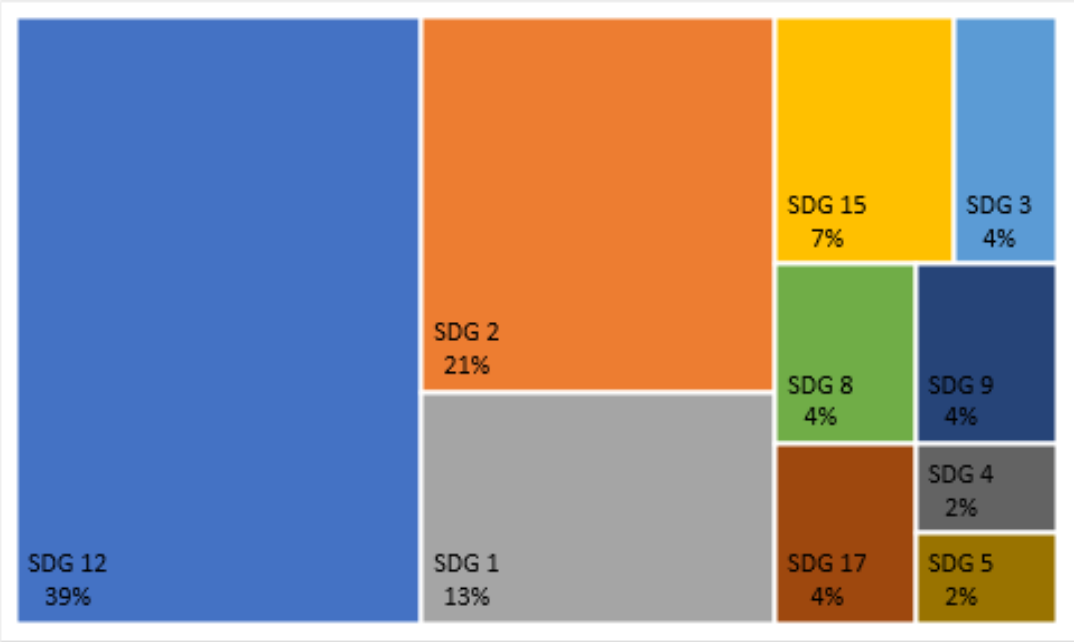
One of the main challenges of family farming is linked to climate change, which leaves the agents involved vulnerable and brings negative effects to agriculture and human well-being. Planning and adaptation strategies along with effective management can guarantee food security for current and future generations (SARKAR et al., 2020). Regarding adaptation in family farming, it is relevant to understand extreme weather conditions, technological issues and financial incentives.

3.2 Relationship with the sustainable development goals

Several aspects can be considered determinant in the production, distribution and sustainable consumption of food, making it worth mentioning the contribution that agents and their roles can provide to the SDGs (Figure 1). It is clear that, through the SDGs, social, environmental and economic issues are addressed. Figure 1 shows the SDGs that were included in the analysis of the study. SDGs 12 and 2 scored the highest in this context, with 39% and 21%, respectively.

From a managerial point of view, it was possible to identify information capable of clarifying the roles of family farming agents in sustainability, thus expanding the perception of different forms of contribution to sustainable production and consumption, as well as the need for support from companies linked to this field. The analysis of Figure 1 allows us to understand the exceptional importance given by agents to the implementation of the UN's SDG 12 (39%, n = 19.89).

Figura 1 - Examination of the SDGs in relation to the roles of agents.



Source: Authors, 2022

SDG 12: Sustainable Consumption and Production deals with the necessary changes in consumption and production patterns as essential measures to reduce society's ecological impact. These measures are the basis of sustainable economic and social development and aim to promote efficient use of energy and natural resources, sustainable infrastructure, and access to basic services. In addition, SDG 12 prioritizes information, coordinated management,

transparency, and the accountability of actors who consume natural resources as key tools for achieving more sustainable patterns of production and consumption (UN, 2015).

SDG 2: Zero Hunger and Sustainable Agriculture (21%, n=10.71) aims to end hunger and malnutrition, achieve food security and improved nutrition (especially for children) and promote sustainable agriculture. Over the last two decades, rapid economic growth and the development of agriculture have cut the proportion of undernourished people in the world in half. However, in 2014 there were still 795 million people living on the spectrum of chronic malnutrition. To achieve the stated goal, it is necessary to promote environmentally balanced agricultural practices through support for family farming as well as equitable access to land, technology and the market (UN, 2015).

In order to obtain economic, environmental and socially sustainable development, differentiated business models are needed in different sectors, including family farming. For example, the sharing economy stands out as a way of maximizing the use of a product by different individuals, allowing society to minimize the consumption of natural resources. It is important to mention, however, the resistance to the changes these business models bring and the lack of skills and abilities to manage those (LABBATE et al., 2020).

Achieving the SDGs is not an easy-to-implement process. It requires the engagement of local actors and professionals who aim for a more balanced environment with a more decentralized structure. Finding the balance between the 17 SDGs requires greater participation from society; in addition, the goals and indicators of the SDGs must be adjusted over time to accommodate changes in society and institutions. While the targets and indicators are the same for all countries, the regional realities, challenges and potentials are different (GIL et al., 2019).

Through this study, it is possible to identify appropriate ways to empower family farmers and help them convert their knowledge into local behavioural changes that will ensure sustainable land management practices are adopted (OLIVER et al., 2020). Currently, it seeks to prepare and provide opportunities for agents to work towards sustainable development in the most diverse areas of knowledge, including family farming.

4 Conclusion

This research is aimed at presenting the role of the human agents involved in family farming, as well as their contributions to the realization of the UN SDGs. Conducting this empirical

research and reviewing the results made it possible to understand and infer the importance of the actors involved in the planning, process and monitoring stages of this sector.

The main roles highlighted by the participating agents were producing food, feeding the population and continuing agricultural activities. From these categories, we were able to highlight the importance of production activity, since the others such as commercialization, distribution and consumption can stem from it. It is concluded that planning in family farming is of utmost importance succeed in the activity. This planning can be for social, environmental or economic issues, encouraging production, distribution and sustainable consumption. Each item favours the activity in different ways, such as reducing costs or increasing productivity.

The identification of the roles of the agents as contemplated in SDGs 12 and SDGs 2, are related to the others. Both SDGs benefit society and the environment with targets focused on production, consumption, agriculture and sustainability. The study highlights the importance of agents promoting family farming, mentioning their roles, their contributions to sustainability and at which stage they operate.

This research presents contributions to the literature and to further studies into the UN SDGs and family farming. The results constitute subsidies for future research and measure the importance of investigations in contributing to the SDGs. They can also help to promote policies and actions aimed at local and global food security, benefitting the population with healthy food of sufficient quality and quantity. In addition, our results contribute to the field with practical projects that will favour agricultural sustainability, bringing important partnerships and implementations to the family farming sector.

For future work, the analysis of the role of agents involved in other activities is indicated, as well as increased understanding of the different categories so that their roles in agricultural activity in other global regions may be discussed. A limiting factor is the lack of similar studies to discuss the role of institutions, such as Emater, Embrapa, unions and secretariats focused on this context. These could create parallels between different regions and countries where family farming is an important source of income, taking into account the preservation of local natural resources.

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