LUMEN ET VIRTUS
ISSN: 2177-2789

SUSTENTA PROGRAM: FARMERS' PERCEPTION OF THE ADOPTION OF LOW-CARBON TECHNOLOGIES IN THE DISTRICT OF CHIÚRE, MOZAMBIQUE

https://doi.org/10.56238/levv15n41-019

Submitted on: 03/09/2024 **Publication date:** 03/10/2024

Belo Albino Malei[1], Dalmildo Agostinho Máquina[2], Amorim António da Costa[3], Adérito Jeremias Vicente da Silva[4], Cipriano Júnior Mourão[5] and Junior Atumane Braimo[6]

ABSTRACT

The Integrated Management of Agriculture and Natural Resources Project (SUSTENTA), implemented by the Ministry of Agriculture and Rural Development (MADER), with funding from the World Bank, is a national program for the integration of family farming into productive value chains with the aim of improving the quality of life of rural households through the promotion of sustainable agriculture (social, social, economic and environmental). The objective of this study is to analyze the perception of producers in the Administrative Post of Ocua, benefited by SUSTENTA regarding the adoption of low carbon emission technologies. This is a qualitative-quantitative study with a descriptive-exploratory approach, based on the snow ball method to survey interviews and questionnaire surveys for 44 farmers. Data analysis was performed using Excell software and SPSS version 25.0. The study showed that most producers are aware of the climate change process, even though they lack the technical knowledge to deal with the phenomenon, are aware that the way they act can interfere in the process and are willing to change their habits and/or

[1] Forest Engineer
Master's Degree in Biodiversity and Conservation at the Federal Institute of Education, Science and Technology Goiano, Brazil
Formator of the Agrarian Institute of Bilibiza/Ocua
Department of Research and Extension, Mozambique
E-mail: belomaleiengflorestal@gmail.com
[2] Forest Engineer. Master's student in Agribusiness at UniLúrio Business School of Lúrio University
Professor at the Faculty of Food and Agricultural Sciences of the Rovuma University, Mozambique
E-mail: dalmildomaquina@gmail.com
[3] Forest Engineer
Master's student in Food and Nutrition Security in the Context of Climate Change at the Faculty of Food and Agricultural Sciences of Rovuma University, Mozambique
E-mail: amoryyymdacosta900@gmail.com
[4] Forest Engineer
Master's student in Rural Development at the Faculty of Agrarian Sciences of the Lúrio University National Directorate of Commercial Agriculture – Department of Agricultural Inputs, Mozambique
E-mail: dasilva.aderito28@gmail.com
[5] Degree in Rural Development
Master's student in Climate Change and Natural Resources Management at the Higher Polytechnic Institute of Gaza (ISPG) – Agriculture Division, Mozambique
Agrarian Development and Rural Extension Fund – Department of Rural Extension, Zambezia Delegation, Mozambique
E-mail: ciprianomourao@gmail.com
[6] Forest Engineer
Faculty of Agricultural Sciences, Lúrio University, Mozambique
E-mail: juniorbraimo@gmail.com

production techniques to contribute to the mitigation or adaptation to climate change. It was found that growers have adopted technologies such as Conservation Agriculture, Seed and Cereal Storage, Ecological Pest Management, Integrated Nutrient Management, Crop Diversification and New Varieties, Improved Post-Harvest and Rainwater Collection and Conservation.

Keywords: Sustains. Producers. Climate Change. Sustainable Technologies.

INTRODUCTION

Recent global climate projections and resulting main scenarios indicate that tropical regions are likely to be potentially more affected by the negative effects of climate change. Especially with regard to the frequency and intensity of climatic events, and their negative consequences for the agricultural sector (BRASIL, 2021). Environmental impacts are no longer considered only in the local and regional dimension and today assume a global character. The most well-known examples, in terms of global impacts, are the depletion of the ozone layer and the greenhouse effect, which in turn also imply changes in the economy itself, demography and social and environmental conditions, that is, changes in relation to population growth, land use and the degradation of soil, water, biodiversity, the evolution of the production process and technology (Cunha, 2008).

For Bergamaschine (2017), climate change represents an urgent and potentially irreversible threat to human society and the planet, because in the Fifth Assessment Report (AR5), the Intergovernmental Panel on Climate Change (IPCC) highlighted that human influence on the climate system is clear and recent anthropogenic greenhouse gas (GHG) emissions are the highest in history. Low-carbon agriculture is one capable of reducing greenhouse gas (GHG) emissions from agricultural and livestock activity through agricultural practices and technologies capable of reducing emissions intensity. low-carbon agriculture can be justified both by the need to reduce the contribution that the sector has in the country's total greenhouse gas emissions, and by the perception that climate change may cause considerable impacts on the sector, bringing challenges to its growth (Gouvello, 2010).

The Sustenta Program is mainly based on the experience of the Integrated Management of Agriculture and Natural Resources Project (SUSTENTA) implemented since 2017 in 10 districts of the Provinces of Zambezia and Nampula, by the Ministry of Agriculture and Rural Development (MADER), financed by the World Bank. It is a national program for the integration of family farming into productive value chains, which aims to improve the quality of life of rural households through the promotion of sustainable agriculture (Ribeiro, 2021).

Mozambique, even if it were to stop emitting Greenhouse Gases (GHG) at a global level, it is recognized that an increase in the minimum temperature of 2.0 ºC in 2100 compared to the climate normals of 1960-1989 is already inevitable. Climate scenarios developed for Mozambique, at the time of the preparation of the First National Communication (PCN), indicate that by 2075 there may be an increase in average air temperature between 1.8 ºC and 3.2 ºC, a reduction in precipitation between 2% and 9%,

an increase in solar radiation between 2% and 3% and an increase in evapotranspiration between 9% and 13% (MICOA, 2012).

The main source of greenhouse gases and anthropogenic aerosols in Mozambique is the burning of biomass, used as an agricultural practice or in land cover change. As an agricultural technique, fires are used to combat pests and clean fields to facilitate field cleaning, sowing and harvesting, especially in local communities. Anthropogenic aerosols, emitted mainly in fires, can absorb and reflect sunlight. This direct interaction between aerosols and sunlight (radiation) defines the direct radioactive force of aerosols. It is very important to emphasize that aerosols and GHGs tend to spread approximately uniformly over the planet (Ambrizzi, 2014).

Sustainable development in agriculture and livestock is an increasingly frequent concern within the Brazilian agribusiness production chains. However, the issue of sustainability is still a central issue in the debate on agriculture and the environment. The excessive use of natural resources without a long-term concern can harm sustainable development (Cechin and Veiga, 2010). There are records on the effects of the depletion of natural resources on productive and social dynamics (Garcia and Vieira Filho, 2018). Thus, periodic analyses are necessary to ascertain whether the growth of agricultural production is in line with the principles of sustainability, as carried out by Telles and Righetto (2019).

It is possible to formulate through what has been exposed, the following research question: What is the level of perception of the farmers benefiting from the SUSTENTA program in relation to low carbon agriculture? As a complement to this question, this research seeks to analyze the perception of agricultural producers regarding the adoption of low carbon emission technologies. Understanding the perception of producers regarding the use of sustainable production techniques, such as those encouraged by SUSTENTA, is fundamental for the success of the program, being a reference for new stages of the project or even for other public policies. In this sense, the research sought to evaluate the levels of environmental perception of the producers of the different Chiúre beneficiaries of SUSTENTA and how this perception is related to their productive choices and their socioeconomic profile.

MATERIALS AND METHODS

LOCATION OF THE STUDY AREA

The study was carried out in the Administrative Post of Ocua (in the localities of Ocua Sede, Samora Machel, Napuco and Mahipa), district of Chiúre, southern part of the province of Cabo Delgado bordered to the north by the district of Ancuabe, to the south by

the province of Nampula through the Lúrio river, to the east by the district of Mecufi and to the west by districts of Namuno and Montepuez (MAE, 2005).

RESEARCH CLASSIFICATION

Regarding the approach to the problem, the present research is classified as qualitative-quantitative. Qualitative because it will be based on analysis and observations of existing cases or information and deepening them. According to Richardson *et al.* (2010) qualitative research can be characterized as the attempt to understand in detail the meanings and situational characteristics presented by the interviewees, rather than the production of quantitative measures of characteristics or behaviors. The research is also quantitative because it is characterized by the use of quantification, both in the modalities of information collection and in the treatment of it through statistical techniques (Prodanov & De Freitas, 2013).

As for the objectives, this research is classified as descriptive-exploratory. The descriptive research according to Marconi and Lakatos (2010) and Albino and Faqueti (2014) through standardized data collection techniques, seeks to collect and describe information on the proposed theme. In this type of research, the researcher is required to provide a series of information about what he or she wishes to research (Silveira and Córdova, 2009). On the other hand, this study is considered exploratory, which is generally useful for diagnosing situations, exploring alternatives or discovering new ideas.

And finally, the research is classified as a Case Study from the point of view of technical procedures. The case study is a research that asks a 'how' or 'why' question about a contemporary set of events over which the researcher has little or no control.

DATA COLLECTION PROCEDURES

The data were obtained in two stages (Diagnosis and *on-site* investigation), through the application of a semi-structured questionnaire and questionnaire survey to the producers and by the *Snowball* investigation method. Therefore, in which the initial respondents, as they are the main expert actors and have knowledge and experience in SUSTENTA, enabled the "kick-off" of this research.The snowball sampling technique or simply *snowball according to* Valasco and Diaz de Rada (1997) and Cohen & Arieli (2014), analyzes different environments, common or contradictory interests, as well as conflicts in contradiction with the goals and presentation of cultural values. According to Baldin and Munhoz (2011), this technique contributes to the "common interests arising from the *modus operandi* and *vivendi*", in which the collected samples become parts that are integrated and

completed in a systemic way in the act of research.

In total, one hundred and eleven (44) producers were interviewed and surveyed, who were considered as participants in this research. These participants gave clarity in the identification of the sectors, actors, enthusiasts and technicians of SUSTENTA with *know-how* (extensive knowledge regarding the operation or implementation) and with *expertise* (extensive experience, scientific research and practice in the adoption of technology) that included technical professionals, researchers and public managers.

The main categories of questions included (i) Socio-economic profile of the adopting producers; ii) Level of production and market integration; iii) Technologies used; and **iv)** Degree of environmental perception. The modulation of the interviews and indication of the interviewees followed the criterion of previous interviewees who reported "new seed members", that is, the interviewees able to add additional information in the data collection as respondents of identical questions for all. The intention was to aggregate and map the maximum number of subjects capable of meeting the interest of the research; identify users who had pertinent and relevant information to the way the SUSTENTA Program was implemented in Ocua.

DATA ANALYSIS AND PROCESSING

For data analysis, Excel software was used for descriptive statistics, data organization and summary in tables and graphs that demonstrated the frequency of the data set of the variables selected in this study. *The* SPSS (*Statistical Package for the Social Sciences*) 25.0 software was also applied, in which it was possible to perform statistical analyses, given the reliability of the data and recommendations of the scientific community, for the performance of the Non-parametric tests for the analysis that represents a set of data where the distribution of the population under study and its parameters are not well known.

RESULTS AND DISCUSSION

SOCIO-ECONOMIC CHARACTERIZATION OF THE FARMERS IN THE SUSTENTA PROGRAM

44 interviews were conducted with farmers directly covered by the SUSTENTA PROGRAM, 2 Small Emerging Commercial Farmers (PACE's) and 42 Small Farmers (PA's) of which 75% are men and 25% women. The National Institute of Statistics - INE (2017a) points out that 52.2% of the Mozambican population was made up of females. For MTESS

(2017), the number of women in rural areas involved in agricultural activities was 84.9%, while that of men, 56%.

There is a variation between the age of the respondents, as 61.36% are aged between 30 and 60 years, 22.73% are in the range of 0 to 30 years, and only 15.91% are in the age group over 60 years. The age of the 44 farmers ranged from 21 to 80 years. The working age in Mozambique, according to MTESS **(**2016) **and** INE (2017b), ranges from 15 to 64 years. With advancing age, many producers abandon agricultural activity, leaving their children as managers. INE (2017a) points out that the participation rate in working age by area was 92.3% for rural and 7.7% for urban.

As for the education of the interviewees, it was observed that 43.18% of the farmers do not know how to read and write, 34.09% have completed primary education, about 22.73% have completed secondary education and the remaining 2.27% have completed higher education. For INE (2017a), education is an important factor in society, since the higher the schooling, the greater the possibilities of social evolution. There is a higher rate of illiteracy in rural areas, with the group of women being the most affected. Thus, it is perceived that in a particular way, the SUSTENTA PROGRAM in Ocua serves a differentiated public with regard to the level of education of its participants.

As for the years of work with agricultural and/or livestock production, 56.82% of the farmers are over 20 years old, 29.54% in the 10 to 20 age group and 13.64% under 10 years old, which reveals that most of them have been practicing these activities for a long time. With regard to the number of people who live and depend on the income generated by farmers, 54.55% of producers live with less than 5 people, and 45.45% live with more than 5 dependent people, as shown in Table 1.

Table 1. Characterization of the farmers

Category	Frequency	Percentage (%)
Gender		
Men	33	75
Women	11	25
Age group		
18 to 30 years old	10	22.73
31 to 60 years old	27	61.36
Over 60 years	7	15.91
Schooling		
No level	19	43.18
Complete Primary Level	15	34.09
Complete Secondary Level	9	20.46
Higher Level	1	2.27
Years of work with agricultural and livestock production		
1 to 10 years	6	13.64

10 to 20 years	13	29.54
more than 20 years	25	56.82
Number of dependents on income generated		
1 to 5 people	24	54.56
6 to 10 people	20	45.45
More than 10 people	0	----------

Source: The Authors (2023)

PRODUCERS' PERCEPTION OF CLIMATE CHANGE

According to the data obtained in the field, 54.54% of producers report having a high concern, 38.64% medium concern and 6.82% low concern about climate change, with 85% saying that yes, the climate is changing and, for sure, there are impacts on agricultural production. Despite showing such a perception, 93.18% of producers admit to knowing little about the phenomenon. That said, they point out, as the biggest environmental problem in that part of the country, uncontrolled fires (64.54%), and deforestation (28.64%). Pires *et al*. (2014) also found that most of the producers interviewed (90%) are aware of the discussions on climate change, that is, they have heard of and/or discussed climate change and its impact on agribusiness.

Of the various impacts on production, producers point to drought (95%), damage through pests and diseases (64%) and drought during the rainy season (87%) as the most expected effects of the phenomenon. It is observed that producers relate the effects of climate change more to the lack of rain and drought, when compared to floods and storms. Furthermore, 100% of the interviewees claim to notice changes in the rainy season in the last 10 years, and for 63.64% of them, there was a decrease in the volume of rainfall and 36.36% changed season and decreased.

Asked about changes in temperature, also in the last 10 years, 100% say they have noticed such a phenomenon, and 75% of these indicated an increase in temperature. Hoffmann (2011), verifying the perception of rural actors in Rio Grande do Sul, observed that 76% of the interviewees reported changes in the climate in the region. Regarding the provisions to change personal habits (not related to production) and to change production techniques, even without receiving financial support to contribute to the fight against climate change, all respondents (100%) stated that yes, they are willing.

Regarding the question of having heard about Climate-Smart Agriculture (CSA), 91% said they had heard of it and 9.% said they had not heard of it. Among the production techniques that have been adopted, those contemplated by the CSA stand out, such as Conservation Agriculture (75%), Seed and Cereal Storage (59%), Ecological Pest Management (41%), Integrated Nutrient Management (38%), Diversification of crops and

new varieties (36%), Improved Post-harvest (9%) and Rainwater Collection and Conservation (2%).

Pitton (2009) observed that, among the respondents who lived in rural areas, only 5% believed that climate change was a natural process and 65% thought that climate change already poses dangers to society. In the study conducted by Andrade and Miccolis (2012), the residents interviewed from the rural community were also very concerned about global environmental problems. These authors stated that, in fact, the perception of the risks of climate change is in the imagination of the population, especially those in the rural community. According to Capstick *et al.* (2015), the perception of individuals in terms of climate change differs between nations or even between different regions of the same country and, in addition, it is dynamic, as it varies over time. For this reason, it is important to know the perception that people have and how this perception varies around the world.

PRODUCERS' PERCEPTION OF THE ADOPTION OF LOW CARBON (CO2) EMISSION TECHNIQUES

Results show the perception of producers in relation to the adoption of low-carbon agricultural production techniques.

According to the data provided by respondents, 52.3% stated that they have heard about Low Carbon Agriculture and 47.7% stated that they have never heard of Low Carbon Agriculture. Among the technologies for low-carbon agriculture, producers answered that they had heard about: Recovery of Degraded Pasture (15%), Recovery of Degraded Areas with Forests (30%), No-Till System (98%), Biological Nitrogen Fixation (95%), Treatment of Animal Desires (43%), Management of Natural Forests (61%) and Planted Forests (70%).

According to the results of the study by Tanure *et al.* (2019) it was found that producers of Demonstration Units with a high degree of the Climate Change Perception Indicator (IPMC) used more the technologies of Recovery of Degraded Areas (RAD) with Pasture and Forests, No-Till System, Biological Nitrogen Fixation and Animal Waste Treatment. The latter is little used by producers with a low level of IPMC, who stand out for the use of Integrated Systems of Crop, Livestock and Forestry/Agroforestry Systems. The authors point out that, of the 8 technologies, producers with a high degree of IPMC stand out as the largest producers adopting 5 technologies, showing a greater diversification in relation to other producers. While in the study carried out by Alves *et at.* (2016) For 52% of rural producers, the activities practiced on their properties contribute to carbon emissions. Among the various justifications presented, there are: the emission by the planting of agricultural crops and by cattle; the degradation of the land; the absence of forest on the

property; the practice of burning; the use of pesticides; and the lack of protection and management of the soil.

Regarding technical assistance and training on low-carbon agriculture, 57% answered that they have received it and the remaining 43% answered that they have not received it. In view of this, the producers indicated that access to technical assistance and training are the determining instruments for the implementation of the technologies listed. In this sense, the importance of programs such as SUSTENTA for the effectiveness and expansion of sustainable production activities is evident. Of the participating producers, 40% say that the main benefit acquired by participating in the program was to have their initiative valued and recognized, while 60% indicate that the main benefit is precisely the technical assistance provided by the program.

FINAL CONSIDERATIONS

Therefore, considering the aspects related to the adoption of low carbon emission technologies, the analysis of the responses of the participating owners to the questionnaire applied allows us to reach the following conclusion: producers perceive the effects of those changes, even if they lack specific and in-depth technical knowledge to deal with such phenomenon. In this work, it was evident the need to stimulate extension work, in the sense of exchanging knowledge with farmers, making them aware of the world situation related to climate change, in addition to presenting them with alternatives for prevention, adaptation and simplified technologies for small farmers. The capacity building and training of actors (technicians and rural producers) are considered the main forms of preparation for the necessary change in the current climate.

In several countries, low-carbon agriculture can be justified both by the need to reduce the contribution that the sector has in the total greenhouse gas emissions of countries, and by the perception that climate change may cause considerable impacts on the sector, bringing challenges to its growth. Finally, as a strategy to strengthen the objectives of SUSTENTA, it is evident that technical assistance agents and institutions acting in the Project that, together, converge in a possible reality for the current and future challenges of the agricultural environment.

REFERENCES

1. Albino, S. de F., & Faqueti, M. F. (2014). *Projecto De Pesquisa*. Brasil: Instituto Federal Catarinense Campus Camboriú.

2. Alves, E. B. B. M., Jacovine, L. A. G., Lima, G. S., Bontempo, G. C., & Torres, C. M. M. E. (2016). As mudanças climáticas e a produção agropecuária: percepção dos produtores rurais da região da Zona da Mata Mineira, Brasil. *Revista Espacios*, 38(18), 24.

3. Ambrizzi, T. (2014). *Base científica das mudanças climáticas*. Vol. 1 – Primeiro relatório de avaliação nacional. COPPE.UFRJ. Rio de Janeiro, 464 p.

4. Andrade, R. M. T., & Miccolis, A. (2012). Diagnóstico de percepção de risco ambiental e mudança climática no núcleo rural da Microbacia do Córrego do Urubu. In *Encontro Nacional da ANPPAS*, 6. Anais... Belém.

5. Baldin, N., & Munhoz, E. M. B. (2011). Snowball (bola de neve): uma técnica metodológica para pesquisa em educação ambiental comunitária. Disponível em http://educere.bruc.com.br/CD2011/pdf/4398_2342.pdf Acesso em 29.jul.2023.

6. Bergamaschine, L. C. (2017). Políticas Públicas e as Contribuições Potenciais do Cerrado para o Cumprimento das metas brasileiras de redução das emissões de gases de efeito estufa. Brasília-DF. Disponível em: http://repositorio.unb.br/handle/10482/31370 Acesso em 29.jul.2023.

7. Capstick, S., Whitmarsh, L., Poortinga, W., Pidgeon, N., & Upham, P. (2015). International trends in public perceptions of climate change over the past quarter century. *WIRESs Climate Change*, 6(4), 435-435.

8. Cechin, A. D., & Veiga, J. E. (2010). A economia ecológica e evolucionária de Georgescu-Roegen. *Revista de Economia Política*, 30(3), 438-454.

9. Cohen, N., & Arieli, T. (2014). Field research in conflict environments: Methodological challenges and snowball sampling. Disponível em: https://journals.sagepub.com/doi/abs/10.1177/0022343311405698 Acesso em 29.jul.2023.

10. Garcia, J. R., & Vieira Filho, J. E. R. (2018). O papel da dimensão ambiental na ocupação do MATOPIBA. *Confins*, 35.

11. Gil, A. C. (1999). *Métodos e técnicas de pesquisa social* (3ª ed.). São Paulo: Atlas.

12. Gouvello, C. (2010). *Brazil low-carbon country case study*. Washington: World Bank. Disponível em http://goo.gl/vGDE8v Acesso em 29.jul.2023.

13. Hoffmann, A. F. (2011). A percepção e o contexto no desenho de estratégias de adaptação à mudança climática no uso agrícola das terras (Dissertação de Mestrado). Universidade Federal de Santa Catarina, Florianópolis.

14. Instituto Nacional De Estatística – INE. (2017a). *Mulheres e homens em Moçambique*. Moçambique. Acesso em 08 de setembro de 2023, de www.ine.gov.mz.

15. Instituto Nacional De Estatística – INE. (2017b). *Resultados definitivos do censo 2017*. Acesso em 08 de setembro de 2023, de http://www.ine.gov.mz/iv-rgph-2017/mocambique/apresentacao-resultados-do-censo-2017-1.

16. Marconi, M. de A., & Lakatos, E. M. (2010). *Metodologia científica* (5ª ed.). São Paulo: Atlas S. A.

17. Ministério Da Agricultura, Pecuária e Abastecimento – MAPA. (2021). *Plano Setorial para Adaptação à Mudança do Clima e Baixa Emissão de Carbono na Agropecuária 2020-2030: Plano Operacional*. Brasília: Mapa/DEPROS, 133p.

18. Ministério Para A Coordenação Da Acção Ambiental – MICOA. (2012). *Estratégia Nacional de Adaptação e Mitigação de Mudanças Climáticas (2013-2025)*. Maputo, Moçambique.

19. MTESS. (2016). *Boletim informativo de mercado de trabalho 2015/2016*. Acesso em 08 de agosto de 2023, de http://www.mitess.gov.mz/boletins-estatisticos.

20. Pires, M. V., Cunha, D. A., Reis, D. I., & Coelho, A. B. (2014). Percepção de produtores rurais em relação às mudanças climáticas e estratégias de adaptação no estado de Minas Gerais, Brasil. *Revista de Ciências Agrárias*, 37(4), 431-440.

21. Pitton, S. E. C. (2009). *Alterações climáticas e a percepção dos munícipes de Rio Claro - SP* (Dissertação de Mestrado). Universidade Estadual Paulista, Rio Claro.

22. Prodanov, C. C., & De Freitas, E. C. (2013). *Metodologia do trabalho científico: Métodos e Técnicas da Pesquisa e do Trabalho Acadêmico* (2ª ed.). Rio Grande do Sul: Associação Pró-Ensino Superior em Novo Hamburgo – ASPEUR; Universidade Feevale Novo Hamburgo.

23. Ribeiro, R. N. (2021). *SUSTENTA: Algumas considerações sobre o papel estratégico atribuído aos PACE*. Observatório do Meio Rural (OMR), Destaque Rural nº 129, Moçambique: Maputo, 6p.

24. Richardson, R. J., & Colaboradores. (2010). *Pesquisa Social: Métodos e Técnicas* (3ª ed.). São Paulo: Editora Atlas S. A.

25. Silveira, D. T., & Córdova, F. P. (2009). Unidade 2 – A Pesquisa Científica. In T. E. Gerhardt & D. T. Silveria (Eds.), *Métodos de pesquisa* (1ª ed.). Universidade Federal do Rio Grande do Sul.

26. Tanure, T. M. do P., Campos, R. F. de A., & Júlio, C. dos R. (2019). Programa Rural Sustentável: Uma avaliação sobre a percepção do produtor a respeito da adoção de tecnologias de baixa emissão de carbono. *Sober*, Ilhéus-BA, 19p.

27. Telles, T. S., & Righetto, A. J. (2019). Crescimento da agropecuária e sustentabilidade ambiental. In J. E. R. Vieira Filho (Org.), *Diagnósticos e desafios da agricultura brasileira* (cap. 3, pp. 89-114). Brasília: IPEA.

28. Velasco, H., & Diaz De Rada, A. (1997). *La lógica de la investigación etnográfica*. Madri: Trotta.