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Chapter 1

Financial stress and job satisfaction: an analysis among family farmers in the municipality of Araçatuba (SP)

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Introduction

Financial issues exert a high influence on people's lives, with money considered a source of stress for 66% of people (APA, 2022). In Brazil, in 2021, 52% of people were stressed about expenses and financial commitments (FSB, 2021). Certain activities, due to their peculiarities, present greater financial instability, such as family farming.

Brazilian family farming faces several challenges, such as heterogeneity within the category itself, income inequality, capitalization, production systems, and the variation in property sizes (Batalha; Souza Filho, 2013; Aquino *et al.*, 2018; Preiss *et al.*, 2020; Pereira, 2021). These factors, coupled with climatic fluctuations, low qualifications of farmers, an uncertain political and economic scenario, and variations in production costs, make the sector unstable.

According to Heo, Lee, and Park (2020), family farming has peculiar market characteristics that can generate financial insecurity. This instability places farmers in a unique and often precarious financial situation (Sprung, 2021). It is important to note that these long-term financial difficulties can cause financial stress. This stress characteristic represents a bodily response involving physical, psychological, and biological aspects to the perception of imbalance, uncertainties, and risks in managing personal and family financial resources, as well as debts (Heo; Cho; Lee, 2020).

Life satisfaction, especially work satisfaction among family farmers, can be affected by financial stress (Heo; Lee; Park, 2020). For Besser and Mann (2015), financial issues, property size, type, and form of production influence satisfaction with agricultural work. Additionally, financial stress is one of the main reasons for abandoning work in the field (Waldman *et al.*, 2021).

Although family farming in Brazil is significant and financial stress causes various problems, there are no national studies on the influence of financial stressors on the stress level of family farmers and whether these affect their level of satisfaction. The study by Roy and Tremblay (2015)

conducted in Canada highlights that workload has been considered a source of stress, especially when farm demands confront the roles of parent and spouse. According to the authors, there is a high-stress factor when the farmer faces the need for provision and the conception of being financially responsible for the family.

Given these aspects, this chapter aims to analyze a list of financial stressors and their influence on the stress level and job satisfaction of family farmers in the municipality of Araçatuba, in the state of São Paulo. Specifically, it aims to compare financial behaviors and perceptions between family farmers with and without stress.

The results presented in this chapter contribute scientifically, economically, and socially by focusing on the financial stress of family farmers. Firstly, financial stress is an interdisciplinary theme that encompasses various fields of knowledge (psychology, physiology, sociology, neuroscience, among others). Understanding the impacts of financial stressors on the stress level and satisfaction of family farmers contributes scientifically to the development of health protocols for stress management and educational programs that foster a financial culture. It contributes socially by analyzing a high-impact phenomenon that is little studied in a relevant economic population but presents vulnerabilities in various aspects. Knowledge and management of financial stress can provide a better quality of life, reflecting in the productivity of family farmers, contributing to their socioeconomic development and their permanence in the field.

Such premises align with the Sustainable Development Goals (SDGs) of the United Nations (UN, 2015). Specifically, SDG 2 – Zero Hunger and Sustainable Agriculture; SDG 3 – Health and Well-being; and SDG 8 – Decent Work and Economic Growth.

Family farming

In Brazil, family farming is the agricultural activity developed on small rural properties, demarcated by up to four fiscal modules, predominantly

with family labor, and the activity carried out on the property must be the family's main source of income (Brasil, 2021).

Family farming, in some regions, is the sector with the greatest potential for social and economic vulnerability (Preiss *et al.*, 2020), as its members are mostly older people, with low educational levels, difficulties in accessing health services, as well as technical assistance and bank loans; factors that place family farming at a relative disadvantage compared to large producers.

Family farming includes 3,897,408 agricultural establishments, with an average area of 21 hectares. However, 26.6% of the establishments have an area of one to five hectares (IBGE, 2019). The predominant economic activity in family farming establishments is livestock and other animal breeding (48.82%), followed by temporary crops (32.60%), and permanent crops (11.09%), among others of lesser expressiveness (IBGE, 2019).

Family farmers have socioeconomic characteristics that distinguish them from other categories. Regarding the educational level, 18.06% declared not knowing how to read and write, 66.85% have primary education, 12.39% have secondary education, and only 2.70% have higher education (IBGE, 2019). The educational level impacts the productivity of the property, as Lindoso *et al.* (2010) state that schooling provides independence to the farmer in seeking information available in various media, which can equip them for decision-making. Clune and Downey (2022) add that the lack of entrepreneurial skills of family farmers results from broader cultural factors, affecting their ability to make assertive decisions.

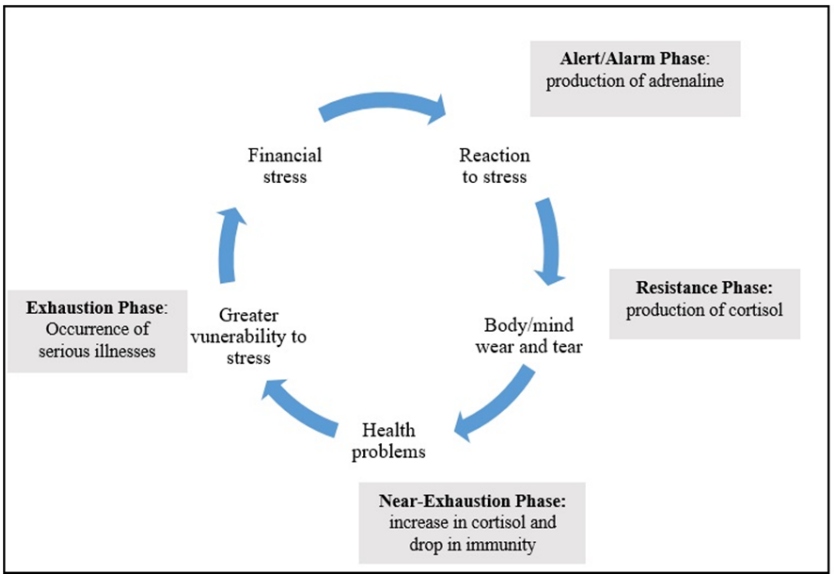
Stress in farmers and financial stressors

In several countries, agriculture has been considered one of the activities triggering high levels of stress, depression, and suicide (enning-Smith *et al.*, 2020; Keeney; Hernandez; Meng, 2020; Kolstrup *et al.*, 2013; Yazd; Wheeler; Zuo, 2019).

Agriculture is affected by several external factors beyond the farmers' control, such as climatic changes, economy, crop pests, livestock diseases, high production costs, and fluctuations in product sale prices, among others, generating uncertainties for the farmer and increasing the risk of stress and mental illnesses (Heo; Lee; Park, 2020; Yazd; Wheeler; Zuo, 2019). Additionally, in many cases, there are debts, long working hours, loneliness, and stress. The farmer must deal with many factors that are beyond their control (Finnigan, 2019).

Stress is an interdisciplinary concept understood as an evaluative process that triggers psychophysiological responses aimed at adapting a person to situations perceived as stressful. When stressors are evaluated as exceeding the individual's capacity to deal with them, or when exposure is repeated or long (Figure 1), it can harm physical and psychological health (APA, 2014; Lazarus; Folkman, 1987; Lipp; Lipp, 2020; McEwen; Wingfield, 2003; Pereira, 2023).

Figure 1 – Stress Cycle



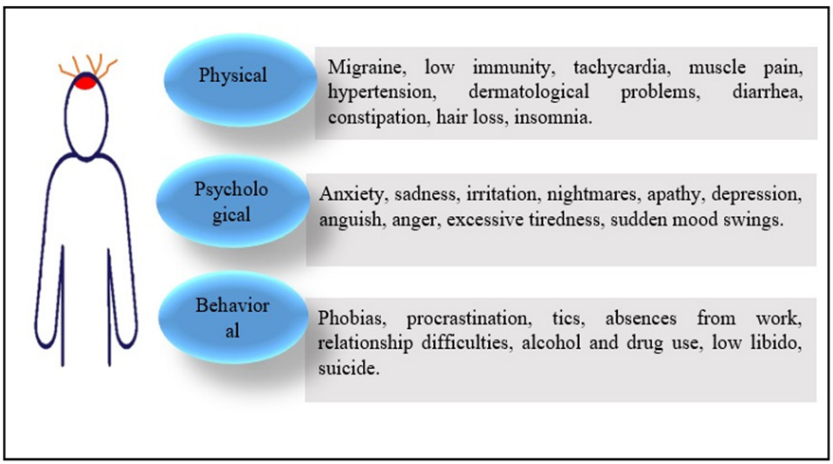
Source: Prepared by the authors, based on Lipp (2005).

Stressors are environmental situations or chronic stimulus conditions that are evaluated as threatening to physical or psychological well-being (Calvo; Gutiérrez-Garcia, 2016). Stressors can be evaluated as irrelevant when they do not threaten the individual; positive, when they generate motivation in the person; or stressful, when they cause harm to the individual (Alhurani *et al.*, 2018).

Financial stress arises when, repeatedly, the individual or family cannot meet financial obligations, which can result in physical, mental, and behavioral symptoms (Friedline; Chen; Morrow, 2021). Figure 2 summarizes the main symptoms of stress. The financial stressor involves the decrease or loss of income, assets, unemployment (Park; Kim, 2018), housing insecurity, and debts (Kelley *et al.*, 2023), among other factors.

Studies conducted in countries such as the United States, Australia, France, Finland, Denmark, and India, among others, highlight financial factors as one of the main stressors in family farming activities (Furey et al., 2016; Besseler; Stallones, 2020; Olowogbon et al., 2018; Rudolphi; Berg; Parsaik, 2020; Sprung, 2021; Hagen *et al.*, 2021; Keeney; Hernandez; Meng, 2020; Waldman *et al.*, 2021).

Figure 2 – Symptoms of Stress



Source: Prepared by the authors, based on: APA (2014); Bryant, Garnham (2014), and Lipp (2005).

Issues related to farmers' finances, including debts, difficulties in obtaining credit, increased production costs, and fluctuations in product sale prices, have been cited in research as having a high potential to trigger stress in farmers. Small farmers cannot exert full control over financial decisions and property management (Heo; Lee; Park, 2020), as the activity is subject to various climatic and macroeconomic contingencies, such as droughts and water scarcity (Fennel *et al.*, 2016), which in turn cause increased production costs and decreased harvest quantities (Henning-Smith *et al.*, 2020).

Job satisfaction[4] is the affective perception (positive or negative) that a person has regarding aspects of their work. It is a multifaceted phenomenon resulting from the interaction between the individual expectations of the worker and the working conditions (Hansen; Straete, 2020; Maidabadi *et al.*, 2022). The financial situation is a relevant condition that influences job satisfaction, as the level of satisfaction is an equation between what is desired and valued and what is obtained from work (Locke, 1976). Hansen and Straete (2020) state that if economic compensation aligns with desired goals, workers will be satisfied. Although job satisfaction involves various aspects, this research focuses solely on the financial factor of job satisfaction among family farmers.

The impacts of financial stressors

The data used in this chapter were collected in the municipality of Araçatuba, located in the northwest region of the state of São Paulo (SP). This is an excerpt from a dissertation that aimed to analyze the levels of stress and stressors among family farmers. The municipality was chosen because it is the largest in the geographical region and due to the economic importance, that agriculture holds in the municipality. Araçatuba is a municipality with approximately two hundred thousand inhabitants (IBGE, 2022) and has

[4] It is important to distinguish between job satisfaction and life satisfaction. The former relates to satisfaction with the content, tasks, income, and benefits provided by the job. The latter refers to other aspects of life, with work being only one of them (Besser; Mann, 2015; Herrera; Gerster-Bentaya; Knierim, 2018).

776 establishments that qualify as family farming (IBGE, 2019). Of this total, 286 establishments are owned by the farmers themselves.

To measure the level of stress, the Lipp Adult Stress Symptom Inventory (ISSL) was used. This inventory was developed in Portuguese by Lipp and validated by Lipp and Guevara (1994). The inventory consists of three sections corresponding to the phases of stress and allows for determining which phase of stress the person is in alert, resistance, near exhaustion, and exhaustion. It also allows for identifying the prevalence of symptoms, whether physical or psychological. The evaluation is done using standardized tables for this instrument, which convert raw data into percentages. According to the inventory manual, the ISSL has a Cronbach's alpha of 0.91 for the overall scale.

To identify and measure financial stressors, a questionnaire was developed based on a literature review of peer-reviewed articles in the Scopus, Web of Science, and PubMed databases. The questionnaire was validated by professionals associated with family farming (agronomists from the municipal agriculture department and presidents of rural associations) and psychologists.

The questionnaire contained the main financial stressors identified in the literature review, such as irregular and/or uncertain monthly income; difficulties in obtaining financing; debts with agricultural and other loans; increased production costs; and fluctuations in product sale prices. The questionnaire was developed using a five-point Likert scale, where farmers were asked to indicate: (0) does not cause stress; (1) very little stress; (2) little stress; (3) moderate stress; and (4) a lot of stress.

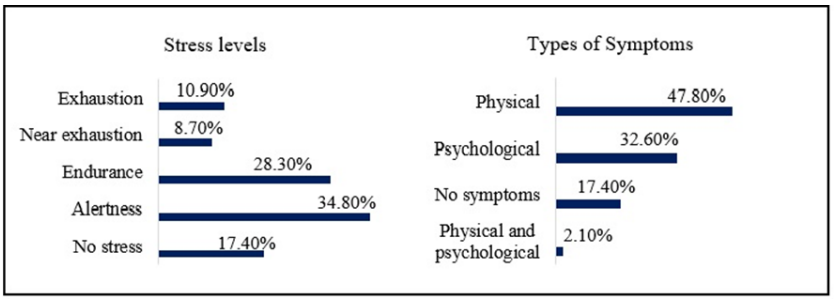
The sample consisted of 46 participants (n=46), contacted through the presidents of rural associations in the municipality. Of these, 57% were male and 43% were female. Among the participants, 30% were aged 61 to 70 years, 26% were 41 to 50 years, and 20% were 31 to 40 years. The average age was 53.23 years with a standard deviation (SD) of 12.60. Regarding marital status, 76% were married, 9% single, 9% widowed, and 7% selected the "other" option. Most of the samples, 59%, identified as white, 22% as brown, 11%

as black, and 9% as yellow. Regarding educational level, 57% had primary education, 26% had secondary education, and 17% had higher education.

Regarding property size, 54% of respondents owned properties of 10 to 20 hectares, with predominant activities being cattle breeding and the cultivation of vegetables, fruits, and soybeans. The family income from agricultural activity was up to one minimum wage for 9% of respondents, one to two minimum wages for 35%, two to three minimum wages for 15%, three to five minimum wages for 22%, and above five minimum wages for 19%.

The sample analyzed in the municipality of Araçatuba-SP showed considerable levels of stress (Figure 3), with 34.8% in the alert/alarm phase (first phase of stress) and 28.3% in the resistance phase (second phase). Although most of the sample showed stress in the two initial phases, both are accompanied by physical and psychological symptoms that can compromise the quality of life of family farmers. Almost 20% are in the higher phases of stress, which denotes greater attention. According to Lipp (2005), up to the near-exhaustion phase, the person can manage the symptoms, but in the exhaustion phase, the help of doctors and psychologists is necessary. Physical symptoms (47.8%) predominated in the analyzed sample.

Figure 3 – Levels of stress and symptomatology of the sample



Source: Prepared by the authors (2024).

The stress levels of family farmers in the municipality of Araçatuba-SP are like those found in the United States by Rudolphi, Berg, and Parsaik

(2020), which obtained the following stress levels: no stress (29.4%), mild (35.9%), moderate (18.2%), and high (16.5%). Other studies conducted in countries such as Ireland (Furey *et al.*, 2016), Finland (Kallioniemi *et al.*, 2016), the United States (Kearney *et al.*, 2014; Keeney; Hernandez; Meng, 2020; Sprung, 2021; Waldman *et al.*, 2021), Australia (Wheeler; Zuo; Loch, 2018), and France (Truchot; Andela, 2018), found moderate stress in most of the analyzed samples. High-stress levels were found in studies conducted in Australia (Gunn *et al.*, 2022), Canada (Jones-Bitton *et al.*, 2019; Hagen *et al.*, 2021), and Vietnam (Hoang *et al.*, 2020).

The identification and measurement questionnaire for stressors revealed the financial stressors that most caused stress among family farmers, as shown in Box 1.

Box 1 – Descriptive Statistics of Financial Stressors

Code	Financial Stressor	Average
F1	Irregular and/or uncertain monthly income	3.6
F2	Difficulties in obtaining agricultural and other financing	2.4
F3	Debts with agricultural and other financing	1.3
F4	Increased production costs or fluctuation in product sale prices	3.8

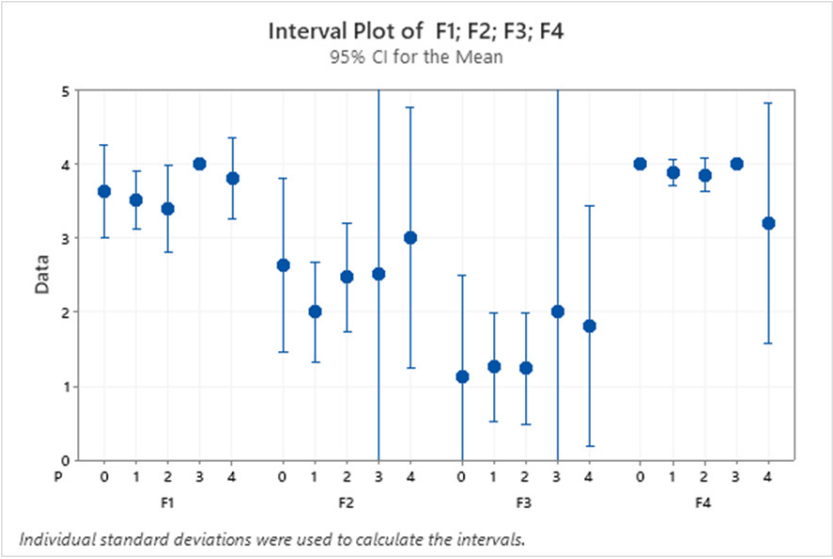
Source: Prepared by the authors (2024).

Two stressors demonstrated greater concerns among the analyzed farmers, with higher averages. Figure 4 shows the dispersion of responses relative to the average. This analysis allows for a comprehensive visualization of the overall behavior of the interview conducted. In Figure 4, a certain response pattern for F1 and F4 can be observed, which resulted in a high average for both stressors.

Of the four financial stressors evaluated by family farmers, the one with the greatest impact was the fluctuation in production costs and product sale prices (3.8), with a maximum score of 4. These factors impact the farm's financial results (Jahangiri *et al.*, 2020; Kearney; Hernandez; Meng, 2020; Wheeler, Zuo; Loch, 2018). To produce, whether, in crops or livestock, the farmer must make investments at a high cost, but without the guarantee of

how much the product will be worth at the time of sale, as prices are regulated by the market (demand and supply). The result found in Araçatuba is like the research conducted by Liang *et al.* (2021) in the United States, which pointed out the decline in sale prices as a stress-generating factor.

Figure 4 – Dispersion of responses relative to the average



Source: Prepared by the authors (2024).

This reflects the second financial stressor, irregular or uncertain monthly income (3.6). Income irregularity is caused by production seasonality, livestock diseases, pests, and market-regulated prices, among others. The unpredictability of monthly income compromises the property's budget and consequently the family's budget. This causes 26% to delay bill payments and 10.8% to seek work off the property to supplement their income. According to Logstein (2016), the decrease in agricultural income directly impacts the increase in mental complaints. Furthermore, the higher the proportion of agricultural income in the total family income, the greater the stress caused by the income drop.

Difficulties in obtaining agricultural financing (2.4) were the third financial stressor. Among the respondents, 48% reported having some type of agricultural financing, and 78% reported finding it difficult to obtain it. Financing, mainly through the National Program for the Strengthening of Family Agriculture (Pronaf), is a way to generate cash flow for investments. However, farmers face a lot of bureaucracy, extensive documentation, and the requirement of collateral to obtain financing. Farmers with smaller properties, low income, and no assets face more difficulties in obtaining agricultural credit. This difficulty in obtaining financing causes a lot of distress among farmers (Pankey; Bandyopadhyay, 2019).

Debts with financing (1.3) proved to be a low-impact stressor for the analyzed farmers. Among the respondents, 50% declared having some type of debt. Farmers with debts have higher stress levels and lower job satisfaction (Heo; Zuo; Park, 2022; Waldman *et al.*, 2021), in addition to triggering disagreements between spouses (Friedline; Chen; Morrow, 2021).

All the financial stressors mentioned above directly impact the final income of family farmers. Among the various factors that predispose to stress, income is considered a factor that generates considerable levels of stress (Orpana; Lemyre; Gravel, 2009).

Anova considering income/stress and subsequent Tukey test revealed a significant difference (Box 2) between the class of stressed and non-stressed farmers.

Box 2 – Income versus stress using the Tukey method and 95% confidence

Has Stress?	N	Average	Grouping
No	8	3.875*	A
Yes	38	2.158*	B

Source: Prepared by the authors (2024). *Indicates a significant difference between the observed values.

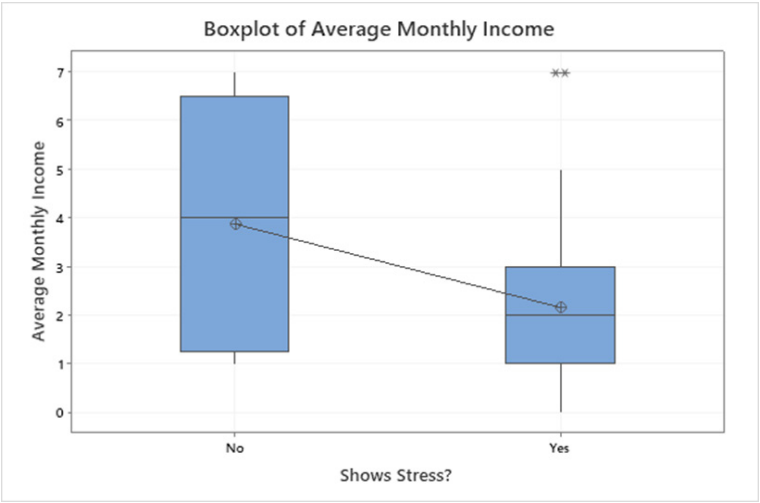
Those who do not show stress earn almost twice as much compared to those who show some level of stress, as shown in Figure 5. In addition to low-income individuals being more exposed to various stressors, this factor

limits their ability to seek stress-coping strategies (Demenech *et al.*, 2022; Hobkirk; Krebs; Muscat, 2021), such as social support and psychological and medical treatment. Income proved to be an impactful factor in the stress of the analyzed farmers.

The income of the farmer is affected by various factors, such as educational level, property size, type of activity, and uncontrollable factors like economic and climatic issues (Kohlbech et al., 2023). Like the general population, income affects the stress levels of family farmers (Feng; Ji; Xu, 2015; Guan *et al.*, 2022). Having another source of income (36% of the sample) can serve as a moderator of financial stress, especially when this income source is from retirement or leases, which do not fluctuate.

Qualitative data collected during interviews with farmers allowed for understanding and comparing the behavioral profiles of family farmers who showed stress with those who did not. Factors influencing the onset of stress related to finances, others that may be consequences of stress, and factors that can be understood as stress moderators were observed.

Figure 5 – Average monthly income: comparison between Family Farmers (A.F) with stress and without stress



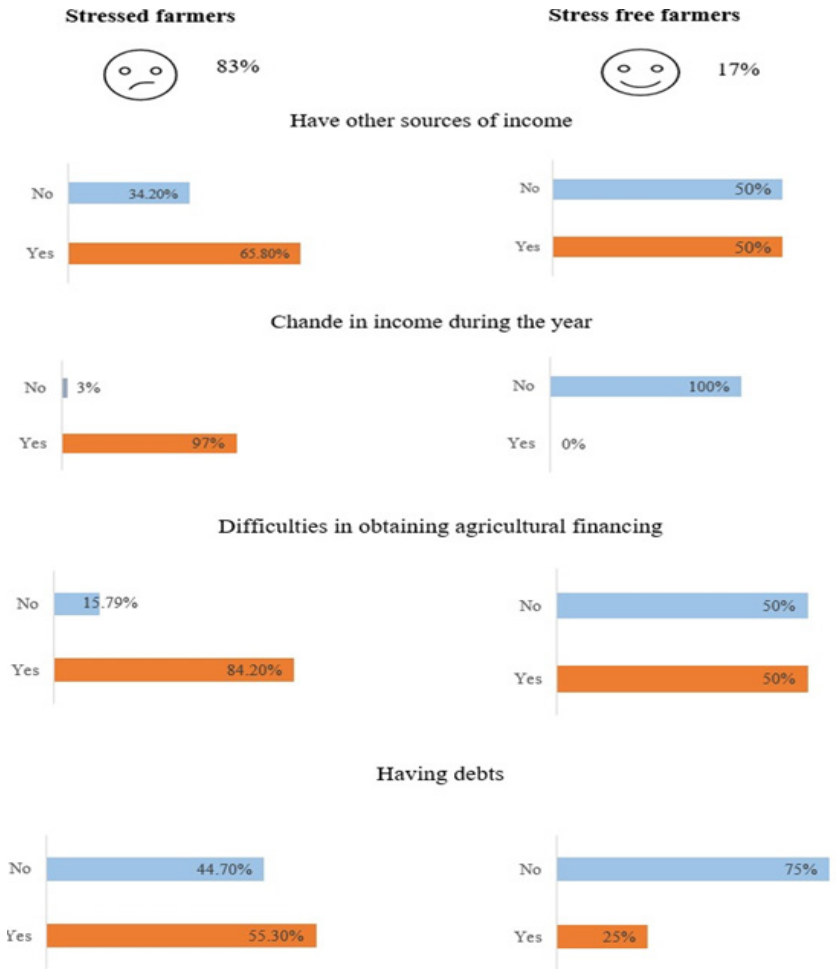
Source: Prepared by the authors (2024).

Among the factors that can influence the stress levels of family farmers are: not having another source of income, variation in monthly income throughout the year, difficulties in obtaining financing, and having debts. Figure 6 compares the responses between those who showed some level of stress and those who did not.

Relying solely on income from the property can be a stress-generating factor, as income is not constant throughout the year, and individual farmers cannot exert full control over the property's earnings due to external factors (Heo; Lee; Park, 2020). The percentage of farmers with stress who do not have another source of income is higher (65.79%) compared to those without stress (34.2%). The research results show that annual income stability occurs for all interviewed farmers without stress, with 100% reporting no income fluctuation throughout the year. Conversely, nearly all farmers with stress experience income variation during the year (97.3%). Not having sufficient income to meet present or future financial obligations creates insecurity in families (Friedline; Chen; Morrow, 2021).

The annual income fluctuation can lead to the accumulation of bills and debts. Debts lead to financial stress (Brit, 2016; Feng; Ji; Xu, 2015; Heo; Cho; Lee, 2020). The research revealed that the number of stressed individuals with debts (55.26%) is much higher than those without stress (25%). Furthermore, the number of farmers with stress who have difficulties in obtaining agricultural financing is proportionally higher (84.21%) compared to 50% of those without stress. Agricultural financing allows the farmer to invest in machinery, purchase fertilizers, irrigation, among others, which can increase property productivity.

Figure 6 – Factors influencing stress: comparison between Family Farmers (A.F) with and without stress



Source: Prepared by the authors (2024).

Some data collected for the chapter can be considered stress moderators. Stress moderators are environmental factors or behavioral characteristics of people that can reduce the negative effects of stress

(Hirschle; Gondim, 2020). In the results, the moderators, as shown in Figure 7, are: actions to minimize the impact of income fluctuation and control property costs. These are factors that, when well employed, contribute to better property management, improve income, and consequently reduce financial stress.

The fluctuation of monthly income is a reality for 97% of farmers with stress, and to minimize this, 28.95% make financial reserves, 18.42% cut expenses, and 10.52% earn extra income, which are considered coping strategies. However, there is a discrepancy in the attitude of delaying bill payments, as 28.95% of those stressed practice this behavior compared to 12.5% of those without stress (Figure 4), demonstrating more assertive behavior in those without stress.

Another behavior that could minimize financial concerns is the control of property costs. Cost control generates better financial forecasting; however, only 55.26% of farmers with stress do this, compared to 87.5% of those without stress. Clune and Downey (2022) reinforce that the lack of entrepreneurial skills among family farmers is a consequence of their low education levels and impacts property results.

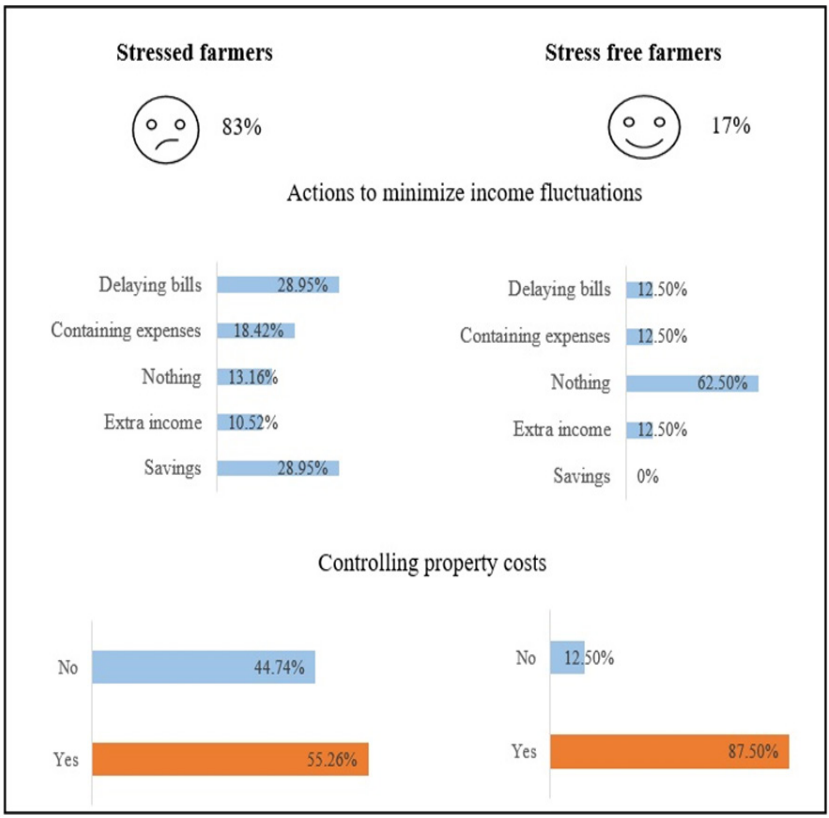
The financial limitation of families[5] makes them more vulnerable to stress (Dinterman; Katchova, 2018; Hagen *et al.*, 2021), which affects job satisfaction (Guan *et al.*, 2022). Figure 8 shows a divergence in perception between family farmers with stress and those without stress regarding job satisfaction, profitability view of the activity, and thoughts of leaving the field.

Job satisfaction includes the positive view that a person has about their job, and for farmers, income and consequently stress from financial factors highly impact the level of satisfaction (Heo, Lee; Park, 2020; Herrera; Gerster-Bentaya; Knierim, 2018; Majdabadi *et al.*, 2022). Regarding the degree of satisfaction, most farmers with stress consider themselves satisfied with their work, but attention should be drawn to the low percentage (13.16%) of those who consider themselves very satisfied compared to 50% of those without stress. The level of dissatisfaction showed a small

[5] Stress in family farming affects the person responsible for the property and consequently the entire family context involved in production, causing suffering in the family environment and difficulties in marital and family relationships (Friedline; Chen; Morrow, 2021; Sprung, 2021).

variation between farmers with stress (29.95%) and farmers without stress (25%). Farmers with stress are more pessimistic about the profitability of their property, as 55.26% believe it is not profitable compared to 25% of those without stress. Farmers with stress show a greater propensity to leave the field.

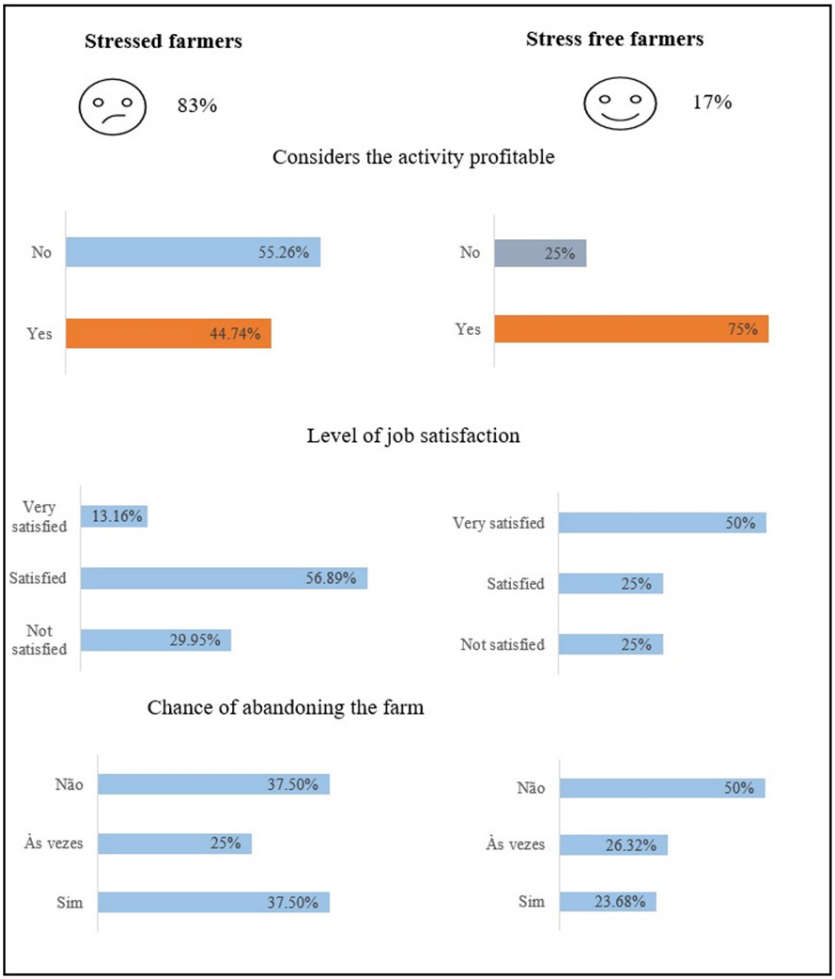
Figure 7 – Factors influencing stress



Source: Prepared by the authors (2024).

Although income is a relevant factor in job satisfaction, it should be noted that there are non-pecuniary benefits that also influence satisfaction. Social benefits, lifestyle, autonomy, among others, are factors that promote a balance in the job satisfaction of family farmers.

Figure 8 – Degree of Job Satisfaction: comparison between A.F with stress and without stress



Source: Prepared by the authors (2024).

Final Considerations

The sustainable socioeconomic development of an agro-industrial production system goes through family farming. Family farming is a social and economic activity of great relevance for several countries, including

Brazil. It is responsible for food production and generating income for many families. As an economic and labor activity, it has its own peculiarities that distinguish it from other activities and requires specific studies to understand its dynamics and develop strategies that help its development.

Like any labor activity, family farming generates stress in its workers, and even though the prevalence is in mild and moderate levels, these levels already require some attention as they affect the quality of life and over time can evolve into more aggressive phases and compromise physical and mental health.

As an economic activity, family farming presents unpredictability, as it depends on climatic, market, and productive factors for its good performance. This unpredictability directly influences the income earned in the field, which can compromise the family's ability to sustain itself. Various financial problems surround family farmers; however, irregular income, fluctuation in production costs, and uncertainty of the production value at the time of sale have been revealed to be more impactful.

Farmers with stress showed characteristics (education level, income, and difficulties in obtaining financing) and behaviors (control of production costs, financial reserves, among others) different from farmers without stress. Such differences can be both a consequence of stress and, on the other hand, something that contributes to stress.

Although financial stress interferes with the level of job satisfaction, many farmers declared themselves satisfied. The way of dealing with stressors and the perception of job satisfaction is associated with cognitive evaluation and the coping strategies used by people.

Identifying how financial stressors affect family farmers is the first step in developing stress treatment protocols and enabling specific financial education programs for this group.

These actions contribute to the development and improvement of the competitiveness of family farmers (one of the objectives of the Graduate Program in Agribusiness and Development – PGAD). Additionally, it contributes to the Sustainable Development Goals by promoting health

and well-being (stress management); decent work and economic growth (fewer physical and mental health complaints caused by stress and financial literacy that will help manage the property) and zero hunger and sustainable agriculture (keeping farmers in the field and food production).

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