AGRO
ECO
LOGÍA

construyendo caminos

2023/2024

PROJECT REPORT







STEERING COMMITTEE

Asociación de Productores Orgánicos - APRO (Paraguay)
Asociación Vivamos Mejor (Guatemala)
Centro Campesino para el Desarrollo Sustentable, A.C. (México)
Centro de Estudos e Promoção da Agricultura de Grupo - Cepagro (Brazil/SC)
Centro de Tecnologias Alternativas Populares - CETAP (Brazil/RS)
Corporación Buen Ambiente - CORAMBIENTE (Colombia)
Fundesyram (El Salvador)
Movimento Mecenas da Vida - MMV (Brazil/BA)
Movimiento de Economía Social y Solidaria del Ecuador - meSSe (Ecuador)
Tijtoca Nemiliztli, A.C. (Mexico)

DATA ANALYSIS AND VISUALIZATION TEAM

Hannah Wittman (UBC)
Isabela Tsutiya Andrade (CEPAGRO)
Riddhi Battu (UBC)
Shubhleen Kaur (UBC)
Martina Propedo (UBC)
Khanh Dao Duc (UBC)
David Trapp (UBC - LiteFarm)
Clara Comandolli de Souza (CEPAGRO)
Isadora Leite Escosteguy (CEPAGRO)
Erika Sagae (CEPAGRO)

SUPPORT

Fundação Interamericana (IAF)
University of British Columbia (UBC)

December 2, 2024

TABLE OF CONTENTS

Presentation 04

Agroecological Indicators 06

Data collection 06

Methodological updates 08

Farming families 08

Demographic data 09

Area 10

Agrobiodiversity 12

Agroecological production 13

Agroecological practices 18

Income 20

Marketing 21

Proximity to urban centers 22

Production and consumption 24

Challenges of agroecological production 25

Potential solutions 27

Gender 29

Retention of youth in agroecology 30

Access to technology 34

Acknowledgements 35





Presentation

This report presents information collected, analyzed and systematized through the participatory action-research project **Agroecology in Latin America: Building Paths**, an initiative that has developed a methodology to monitor and evaluate the social, economic and environmental contributions of agroecology using community-driven indicators. The project has been developed since 2020 by 10 farming organizations in partnership with researchers and farming families in seven Latin American countries.

This is the fourth report of the project and shares data collected between July 2023 and June 2024 on 11 agroecological indicators defined in 2022 by the project Steering Committee in conversation with each of their farming communities. Each of the indicators includes a combination of quantitative and qualitative data drawn from farmer surveys and interviews, along with detailed records of farming practices provided by farmers through the LiteFarm app, based on the principles of data sovereignty.

With this initiative, we seek to contribute to the construction of agroecological knowledge and influence the design of public policies and projects that promote agroecological transitions and support family farmers in the management of their agricultural units based on clear, consistent and evidenced information.

The project's Steering Committee is composed of: Asociación de Productores Orgánicos - APRO (Paraguay), Asociación Vivamos Mejor (Guatemala), Corporación Buen Ambiente - CORAMBIENTE (Colombia), Fundesyram (El Salvador), Movimiento de Economía Social y Solidaria del Ecuador (Ecuador), Centro Campesino, A.C. and Tijtoca Nemiliztli. (Mexico), Cepagro, CETAP and Movimento Maecenas da Vida (Brazil). The Inter-American Foundation (IAF) and the University of British Columbia (UBC) support this project.

The project "Agroecology in Latin America: Building Pathways" encompasses

7 COUNTRIES



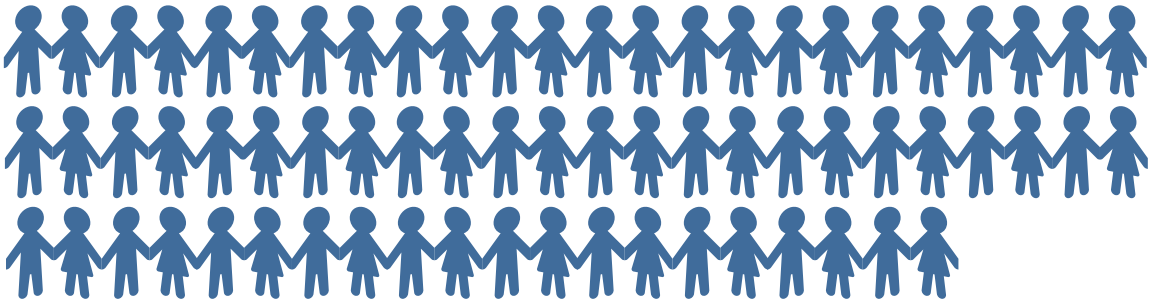
Mexico, Guatemala, El Salvador, Colombia, Ecuador, Paraguay, and Brazil.



It is collectively developed by

10 NON-PROFIT ORGANIZATIONS

In collaboration with the University of British Columbia, Canada.



This report includes data providede by

313 FARMING FAMILIES

450 families will participate in the project by September 2025.

Agroecological Indicators

Agroecology aims not only at food production, but also at the sustainability of ecosystems, social justice and equity, and the economic viability of rural and urban communities. Given this complexity, it is essential to evaluate agroecological development through indicators that cover the three dimensions: social, economic and environmental. Eleven indicators were selected for this Action Research*.

Table 1: *Agroecological indicators evaluated:*

Category	Indicator
Social	Gender relations Production-consumption relations Intergenerational success Access to technology Challenges for the agroecological transition
Economic	Agricultural unit size Production Marketing channels
Environmental	Agrobiodiversity Natural Areas Agroecological Practices

Data collection

Data collection is conducted using two free and open-source digital tools:

SurveyStack (app.surveystack.io) is an application designed to support research groups to allow the creation of customizable and shared questionnaires. SurveyStack is used in the project once a year when questionnaires are administered to families to obtain information on qualitative indicators. The design of the questionnaires was based on questions formulated for the Participatory Guarantee Systems (PGS) certification process adopted by some of the participating organizations.

LiteFarm (litefarm.org) is a farm management application created by the University of British Columbia and co-developed by the project Steering Committee. Its features are designed specifically for the needs of sustainable and diversified agriculture.

**Refer to the 2021 report for a more extensive examination of the methodology for selecting indicators.*

LiteFarm facilitates the collection of quantitative data, such as area, quantity and diversity of crops, harvests, tasks performed, etc.

As of July 2024, LiteFarm is used by over 5,300 farms worldwide.

Figure 1: LiteFarm accounts established by region 2020-2024

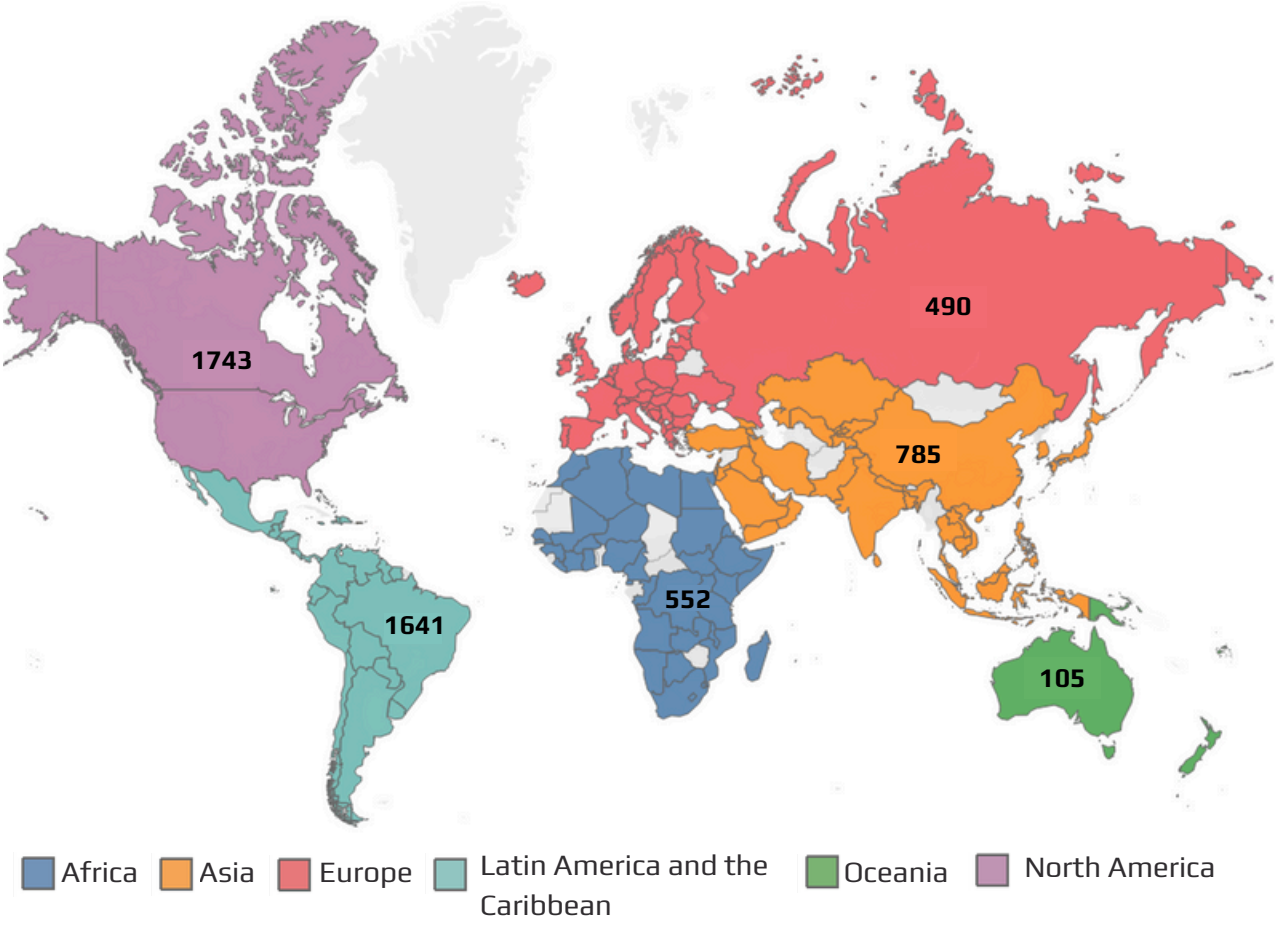


Table 2: New accounts established in the 7 project nations July 2023-June 2024

Country	New accounts
Brazil	236
Colombia	135
Ecuador	39
El Salvador	7
Guatemala	44
Mexico	58
Paraguay	100

Methodological updates

In the 2024 report, new questions were introduced in the SurveyStack questionnaires to collect more detailed demographic data from farm families and thus obtain a more complete and diverse portrait of the families, allowing for a detailed demographic analysis that considers aspects of age and gender.

It is also worth explaining that in this report we chose to adopt the term “farming family units” to refer to the properties or farms managed by the farm families mapped in this action research. For clarity and conciseness throughout the text, we will sometimes use the abbreviation “farming units”. This convention is intended to facilitate the reading and understanding of the report, while maintaining precision and focus in the analysis of the practices and impacts of family farming units in the context of agroecology.

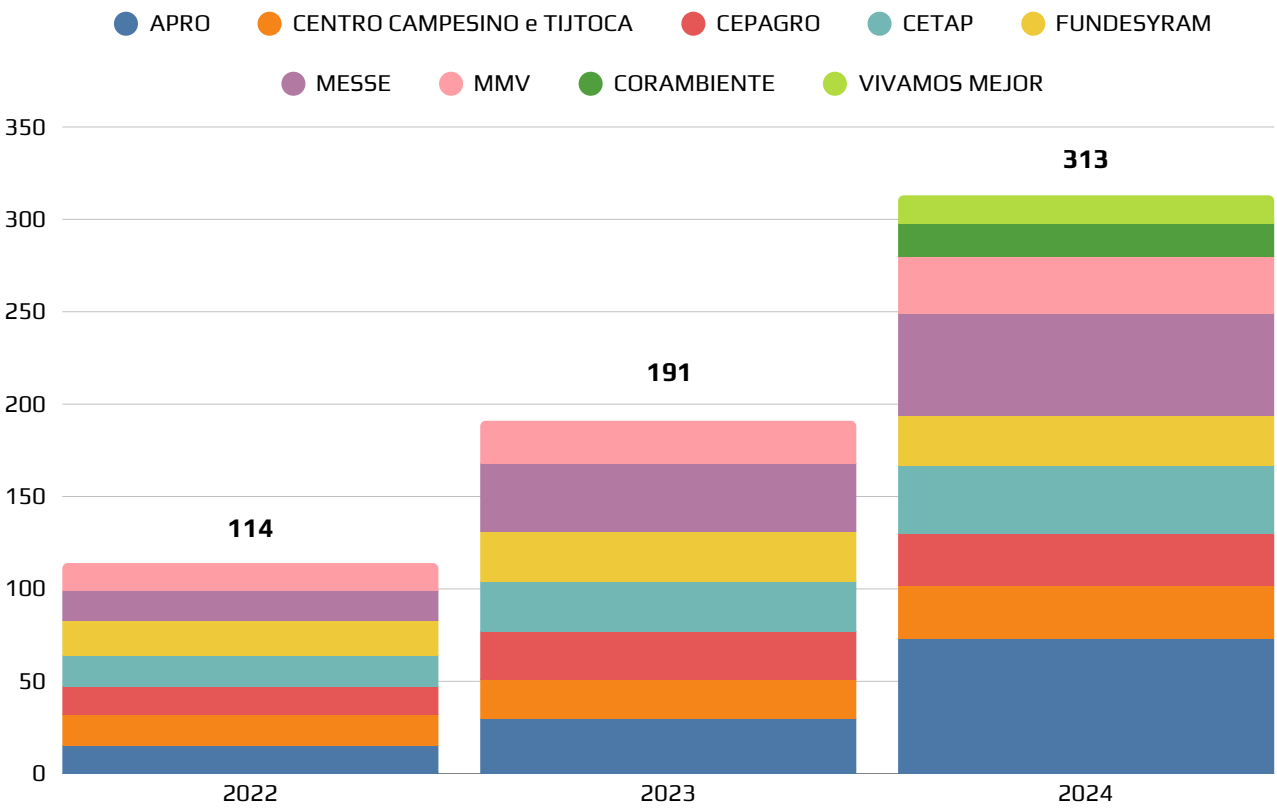


Farming Families

In 2024, 313 farm families participated in the project. All registered their farm units in LiteFarm, while 286 responded to the SurveyStack questionnaire. LiteFarm information (LF) refers to all households while the SurveyStack information (SS) covers the 286 households that responded.

It's important to note that in some graphs, the information regarding families supported by the organizations Vivamos Mejor and Corambiente is either missing or less prominent, as these organizations joined the project only in 2023.

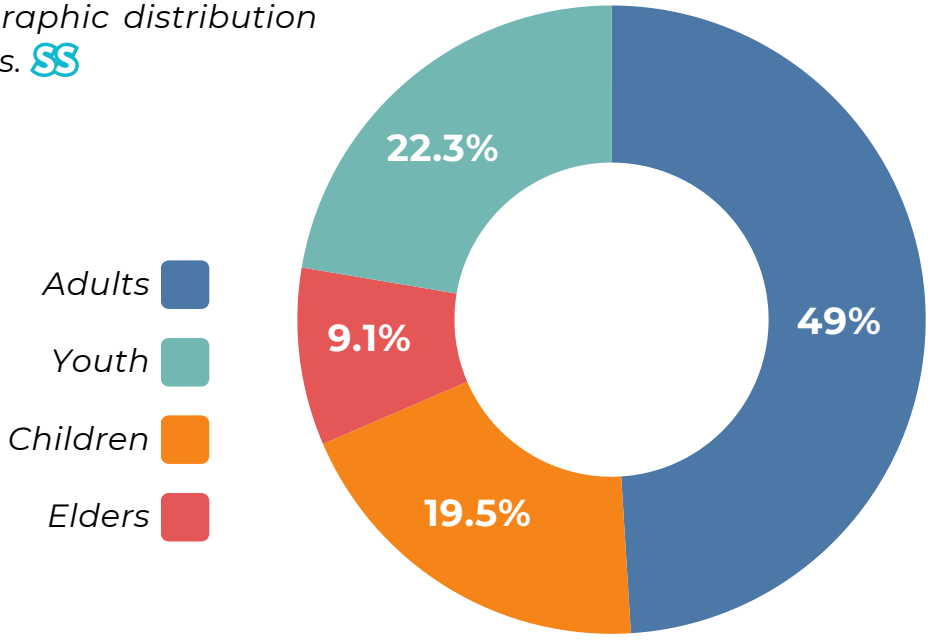
Figure 2: *Participating Families, 2022-present.*



Demographic data

The 286 families mapped were composed of 1,271 people, 248 children (up to 14 years old), 284 youth (15-29 years old), 623 adults (30-64 years old) and 116 elderly (over 64 years old). The gender distribution among the four age groups was almost equivalent, with 51% males and 49% females, with no persons identifying with another gender.

Figure 3: *Demographic distribution across age groups.*



Area

By utilizing the maps drawn in LiteFarm (see example in Image 1), the total, natural and productive areas of each family farm unit were mapped.

The total area corresponds to the area contained within the boundaries of the agricultural unit. Of the 313 accounts registered in LiteFarm, 268 had their farm unit boundaries mapped.

Productive areas represent the sum total of cultivated areas, such as orchards, fields and greenhouses. 286 LiteFarm accounts mapped at least one production area.

Finally, natural areas correspond to areas that maintain their natural characteristics without significant human modifications. It is important to note that, for the purposes of this action research, the term “natural area” was adopted, but its meaning may vary among different countries. 135 accounts had at least one area designated as a natural area on the LiteFarm map.

Image 1: *Agroecological farm in Santa Catarina, Southern Brazil, registered on LiteFarm.*

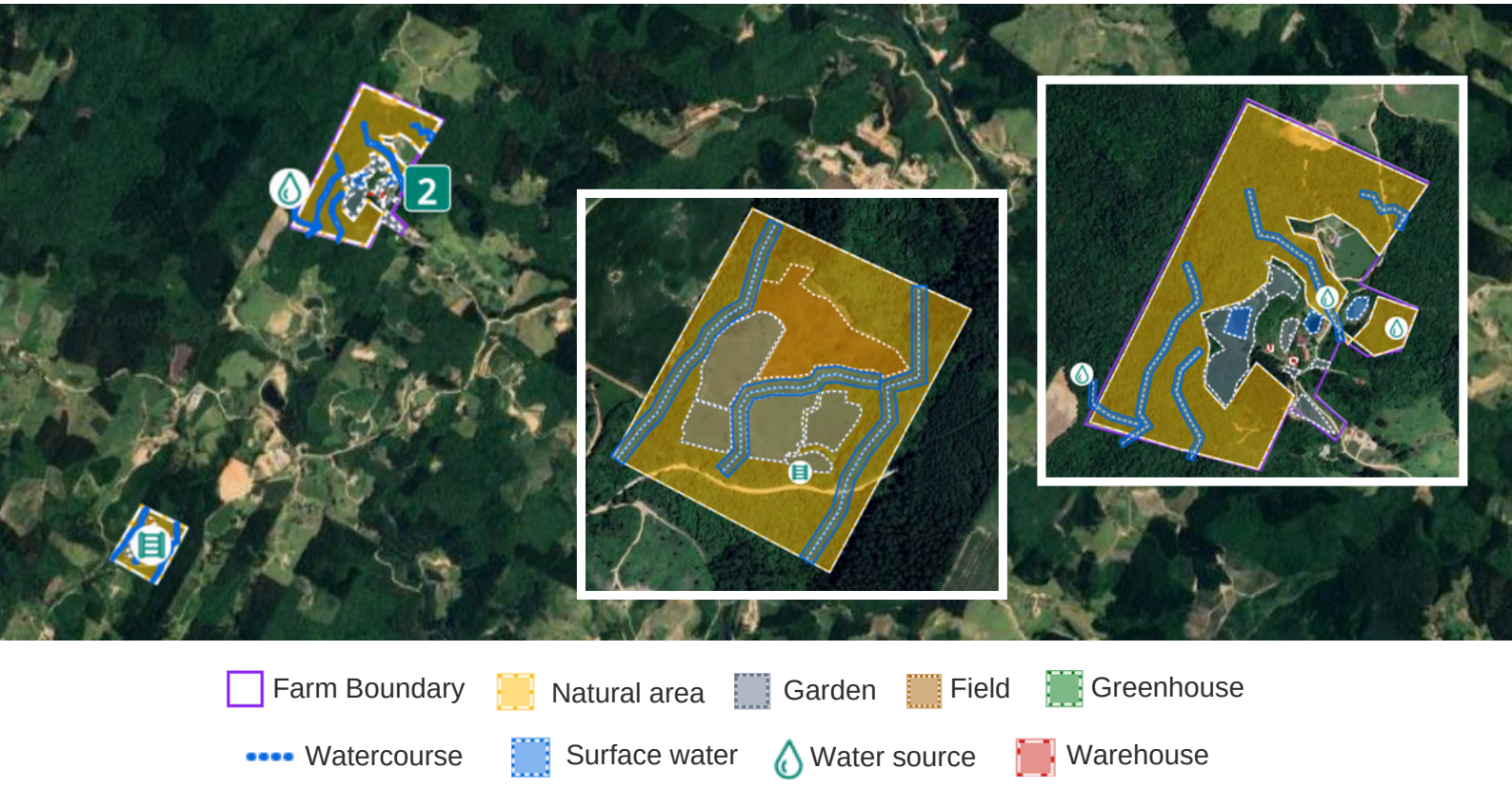


Figure 4: The 313 mapped agricultural units add up to:

2.028 ha
total area

1.029 ha
productive area

859 ha
natural area

Figure 5: Productive area, natural area, and other areas.

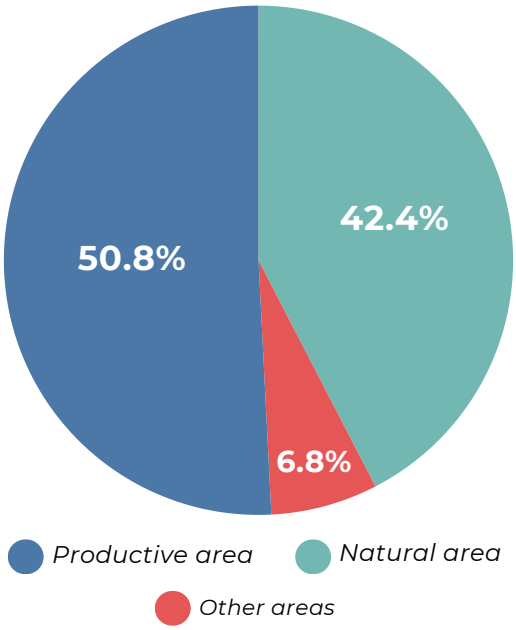
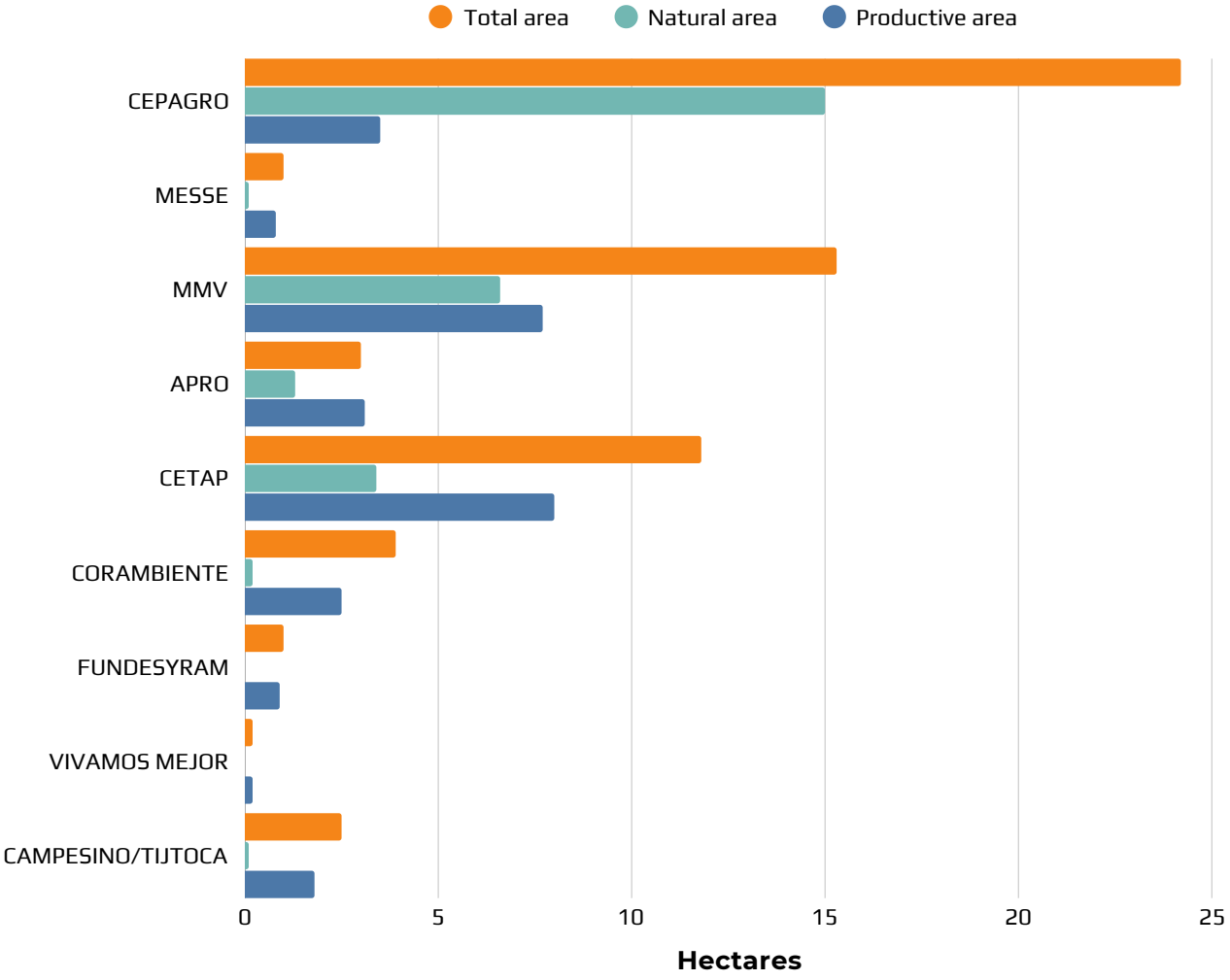


Figure 6: *Average total, natural, and productive area (ha) in each organization.*



Agrobiodiversity

The agrobiodiversity indicator was measured based on the cropping plans registered in LiteFarm and represents the varieties that are currently being grown, have been grown in the past and/or are planned to be grown in the future.

Figure 7: *Total number of species registered in LiteFarm across the 313 agricultural units, by organization, and the average number of species per agricultural unit since January 2021.*

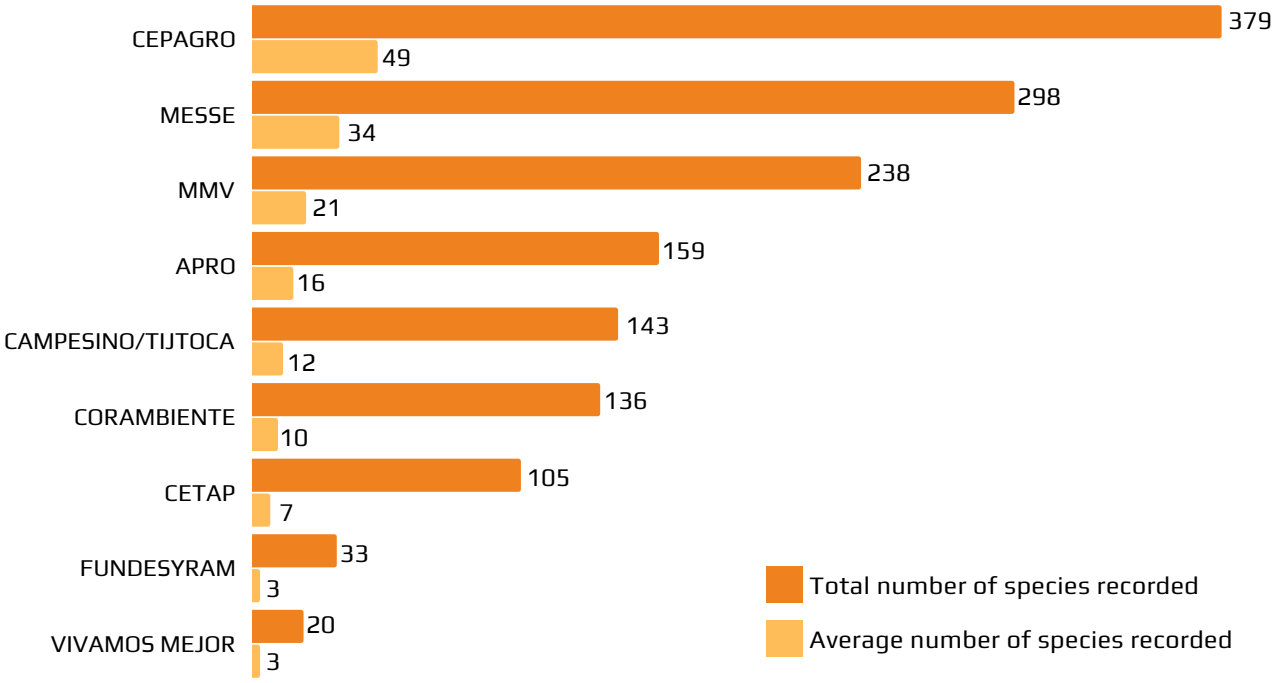
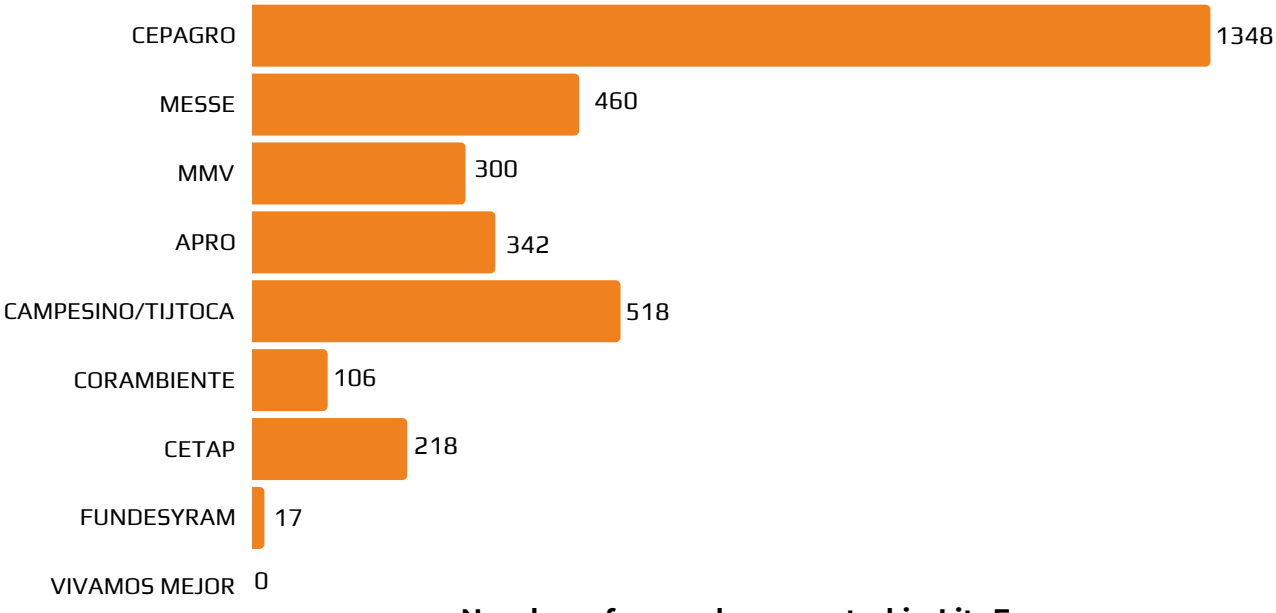


Figure 8: *Number of crop plans created in the 313 farming units by organization in the last 12 months.*



Agroecological production

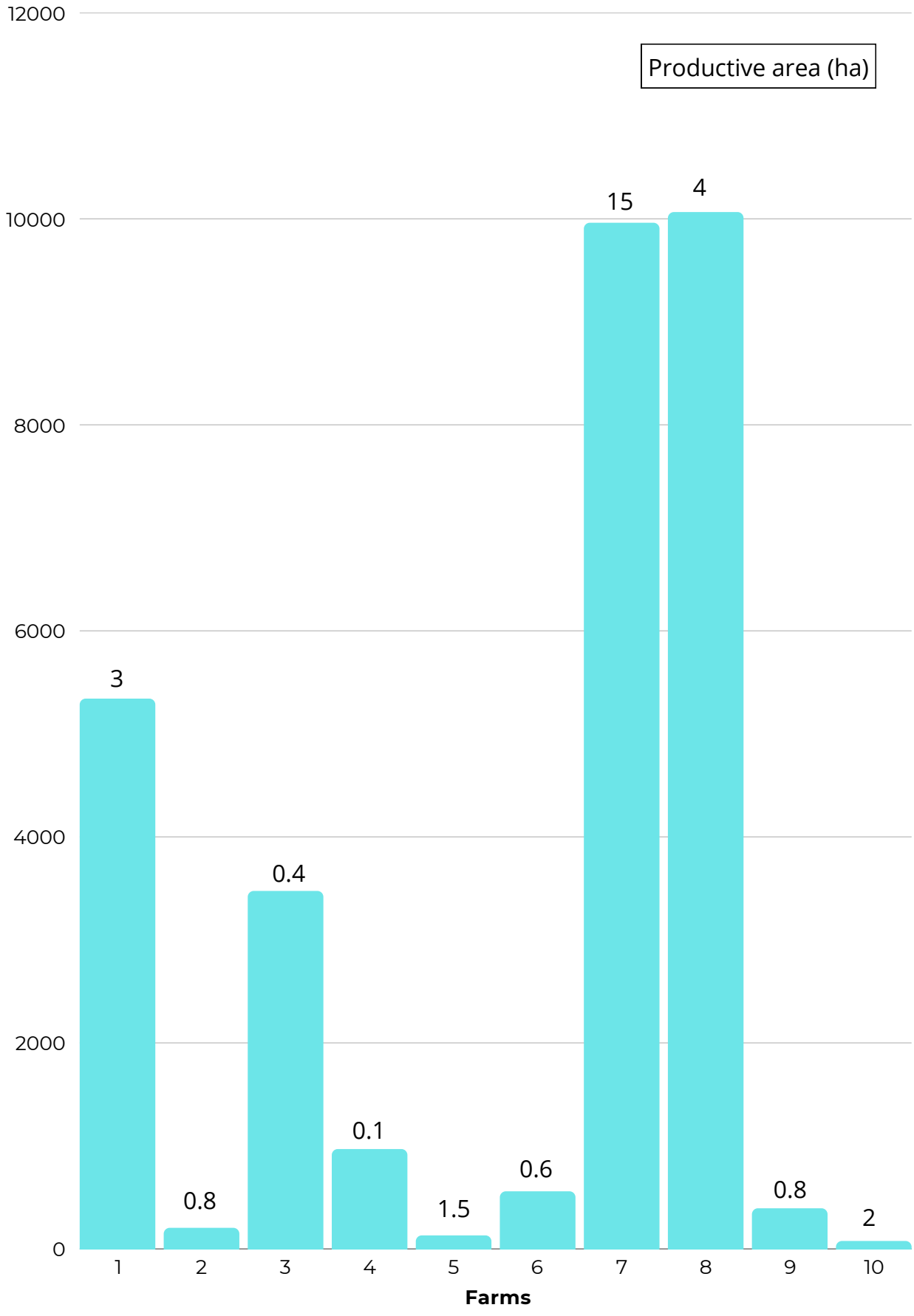
Measuring the productivity of agroecology poses a significant challenge due to factors like the absence of a recording culture, diverse production, and inadequate data systematization tools. Including precise data aligned with actual values for all food produced on-site, both for sale and home consumption, is crucial to prevent underestimation, which could lead to a detrimental view of agroecology.

Between July 2023 and June 2024, some of the families participating in the project faced challenges, for different reasons, in maintaining detailed records of their harvests. In response, for this session, we narrowed the scope of the analysis and used representative data from 10 agricultural units monitored by Cepagro in Santa Catarina, Brazil, which were able to maintain complete records of their harvests during the period covered by this report. Despite the reduction in data scope, we still wanted to delve into this indicator, as these analyses exemplify what can be achieved at the project level when complete harvest data from all families becomes available.

Alongside the gross productivity values (Figure 9), correlation analyses were conducted to explore the relationship between productivity and various indicators, including the implementation of agroecological practices, and the range of marketing channels. For each graph, there is a correlation coefficient. We consider that correlation coefficients less than 0.4 are weak and those above 0.4 are strong.

An additional observation made by some organizations is that production data is more detailed in agricultural units where there is a presence of young farmers, as well as young rural scholarship recipients from the project, since youth tend to be more familiar with digital tools such as LiteFarm.

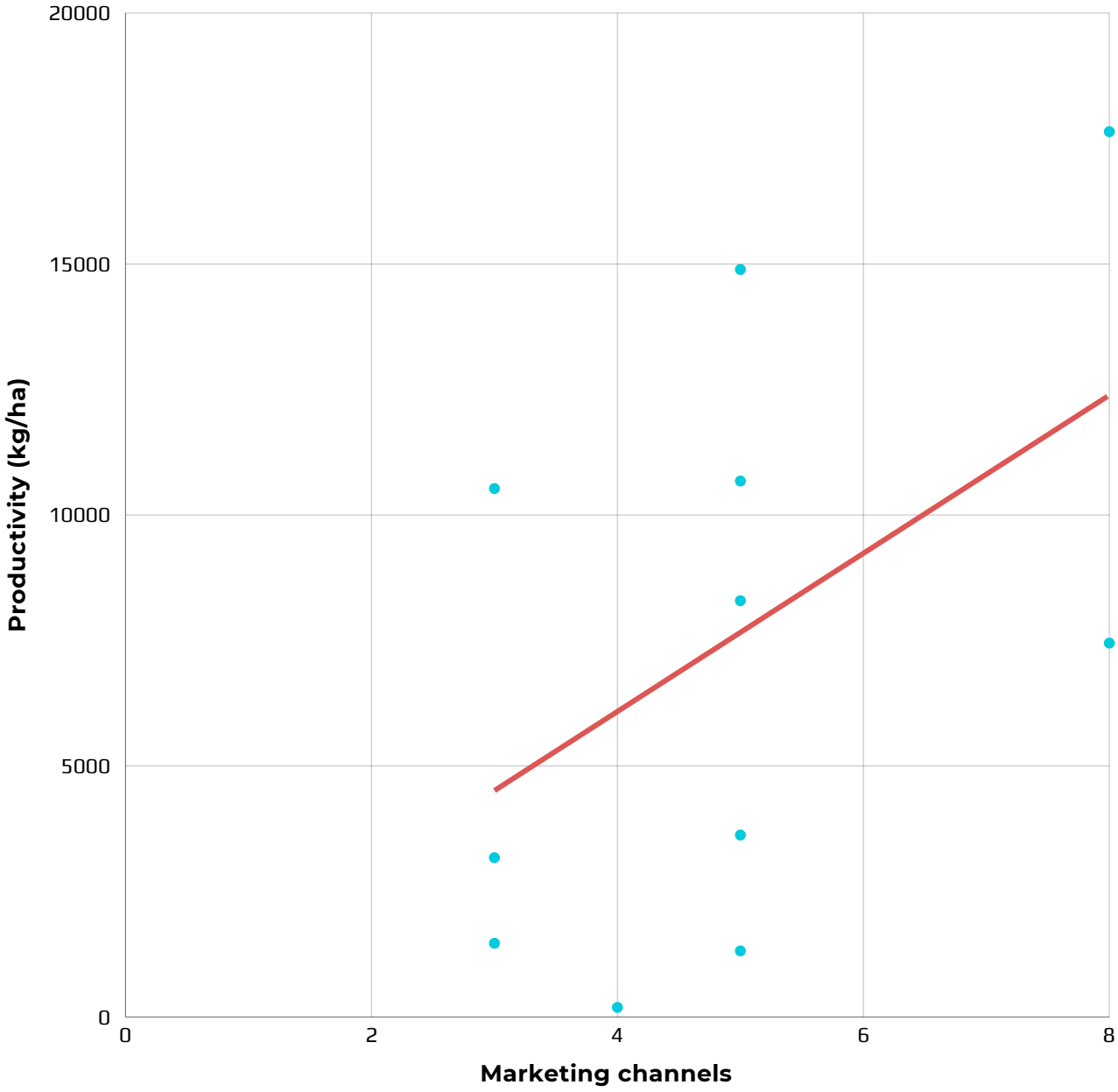
Figure 9: *Harvest quantities (kg) per agricultural unit monitored by CEPAGRO , from July 2023 to June 2024 (N=10).*



Productivity and Marketing Channels

The following figure (Figure 10), depicts the relationship between productivity and the diversity of marketing channels. The line indicates that where the productivity of legumes and vegetables is higher, the number of marketing channels used is also greater.

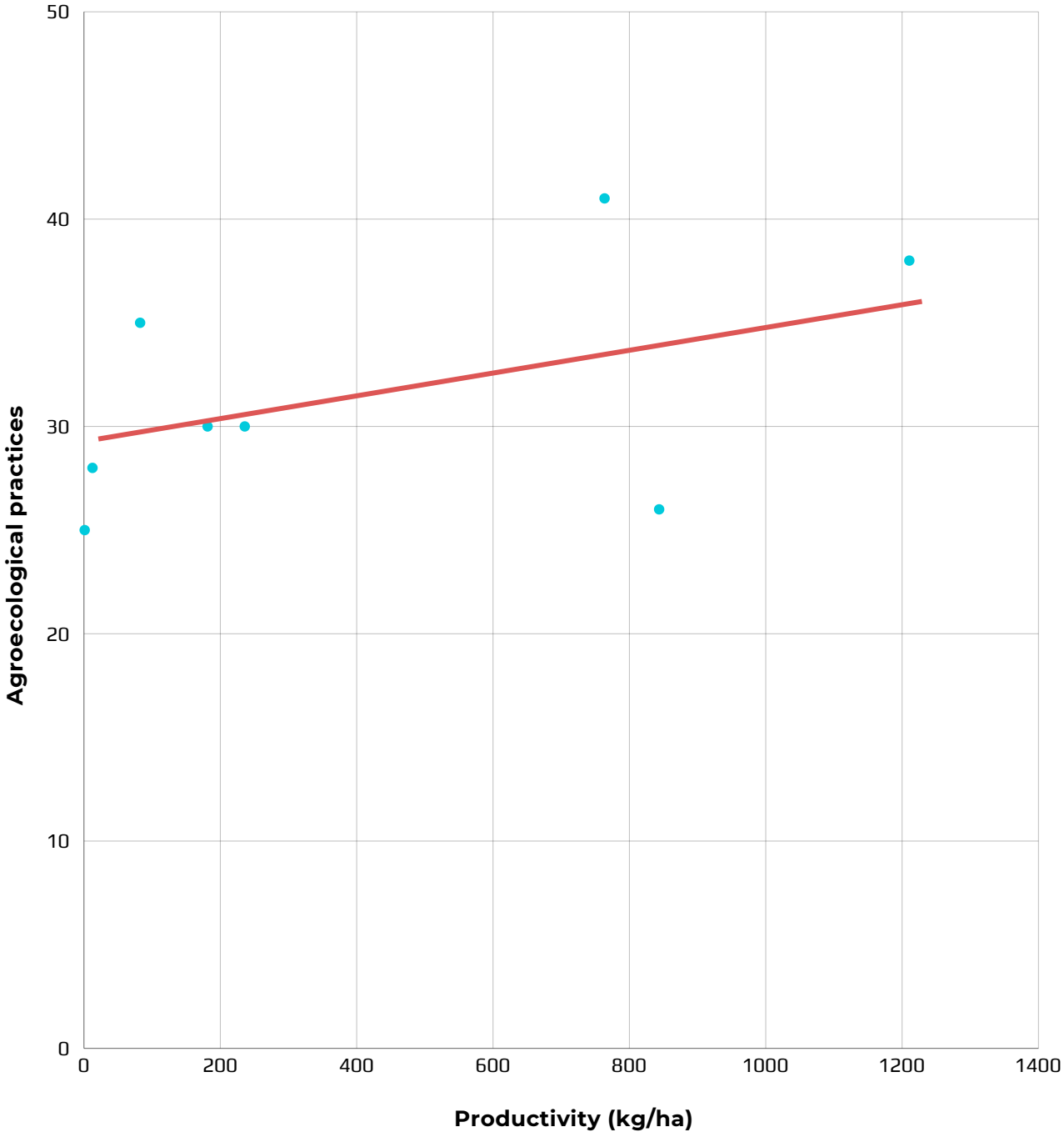
Figure 10: *Correlation between average productivity (kg/ha) and marketing channels, (N=10 with a correlation coefficient of 0.51).* SS//LF



Enhancing Agricultural Productivity through Agroecological Practices

The analysis below indicates that increased adoption of agroecological practices by farming families correlates with higher productivity levels.

Figure 11: *Correlation between average productivity (kg/ha) and the adoption of agroecological practices (N=10, Correlation=0.52).* SS//LF



Despite being an interesting and important indicator to dissipate myths related to agroecological production and to defend its priority in public policies, measuring productivity in agroecology is not an easy task. In addition to the reasons mentioned at the beginning of this section, agroecology considers the interaction between plants, soil, climate and living organisms, focusing on the sustainability and health of ecosystems and not only on commodity production. This means that indicators of success must go beyond considering the yield of a single crop, but also consider other indicators such as soil health, biodiversity, labour quality, and cost of production per crop.

Agroecological productivity extends beyond conventional yield measures employed in industrial agriculture. It encompasses factors like food nutritional quality, crop resilience to diseases and pests, water and soil conservation, and reduction of carbon footprint. Agroecology also tackles social and economic concerns, including farmer empowerment and food security. In essence, harmonizing and incorporating these diverse aspects and metrics is a highly intricate endeavour. It is important to exercise and develop methodologies that bring to light scientific evidence on agroecology.



Agroecological practices

Agroecological practices aim to achieve sustainability, environmental conservation and improved quality of life, integrating principles of ecology and wellbeing with agriculture. They may vary significantly according to the local context, such as climate, soil and culture, but in any case, they are fundamental to the agroecological transition process. Measuring the diversity of agroecological practices can help us understand how agroecology can be applied and promoted more effectively.

The charts below present some of these practices, highlighting those that enhance the biodiversity of the agricultural unit, as well as soil management and conservation practices. They also provide an overview of the use of these practices by the families participating in the project, showing the number of families using each of them.

Figure 12: *Agroecological practices (N=286).*

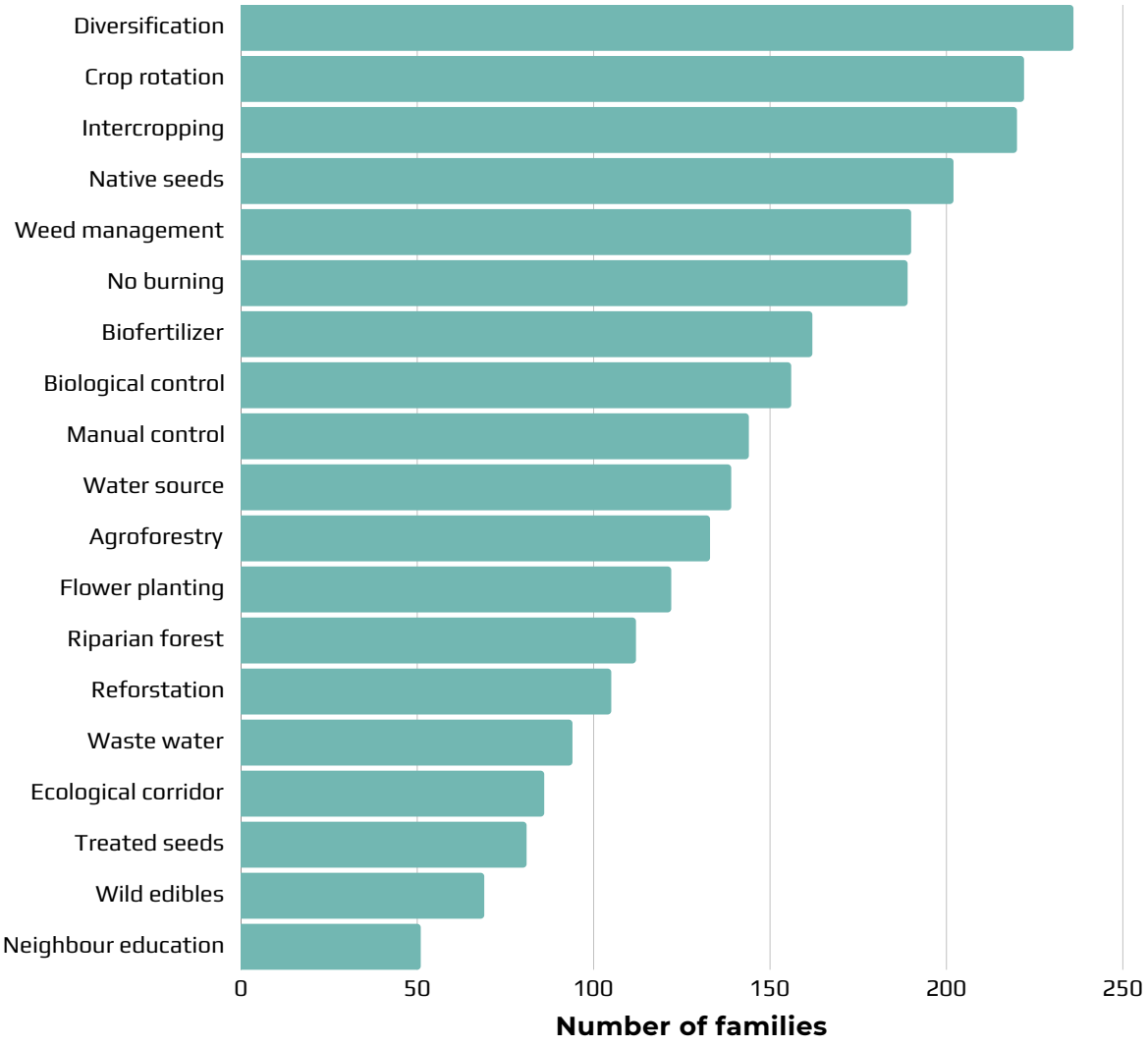
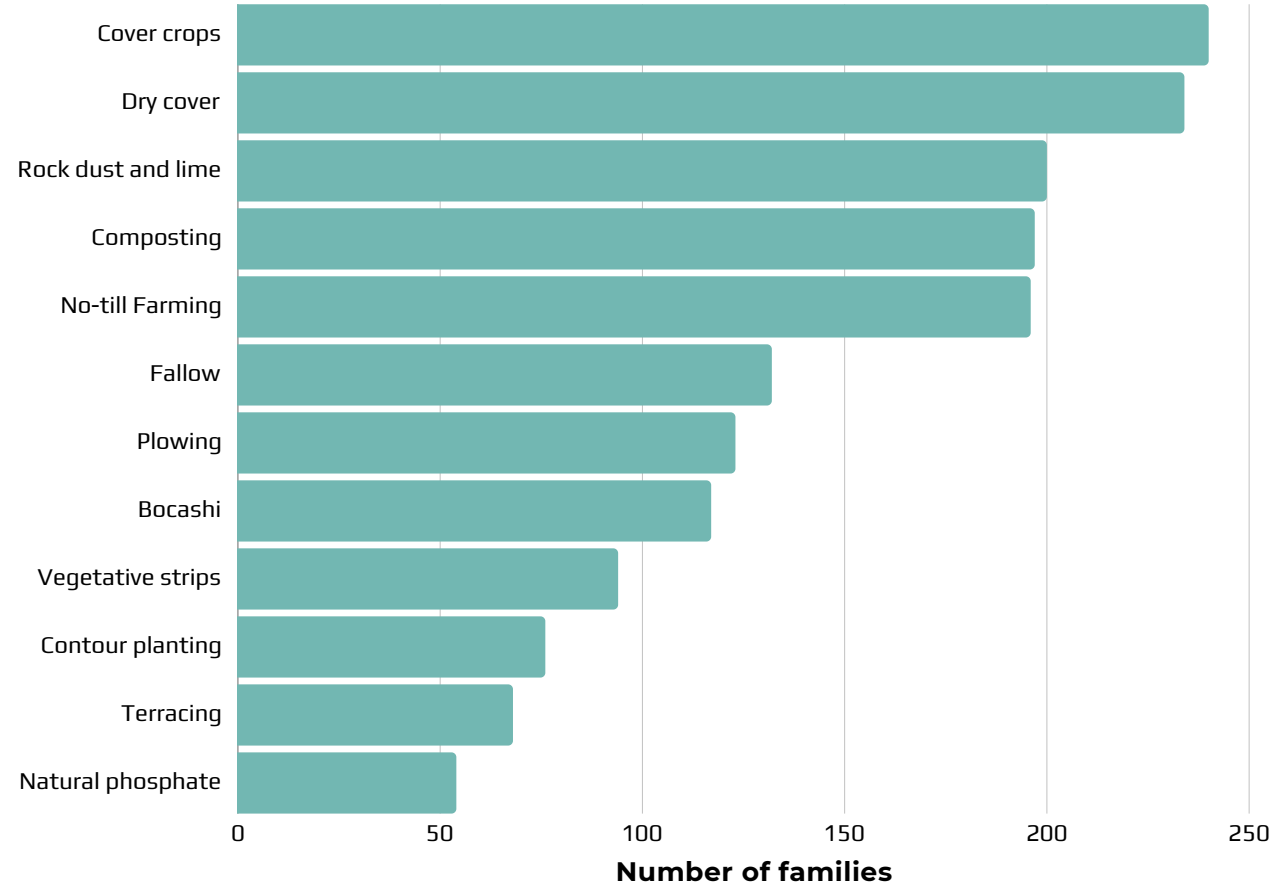


Figure 13: *Soil health practices (N=286).*





Agroforestry





Dry cover and mixed crops



Native seeds

In addition to the practices presented above, some families also reported performing non-agroecological practices, such as the use of plastic mulches (34 families), synthetic pest control (15 families), synthetic fertilizers (14 families) and residue burning (13 families).

Income

Out of the 286 families, 149 work exclusively in agriculture, while 137 have other sources of income, such as retirement, various services offered within the agricultural unit (courses, tourism, processing*, etc.) and/or services provided outside the agricultural unit.

Figure 14: *Families working exclusively or not in agriculture (N=286).*

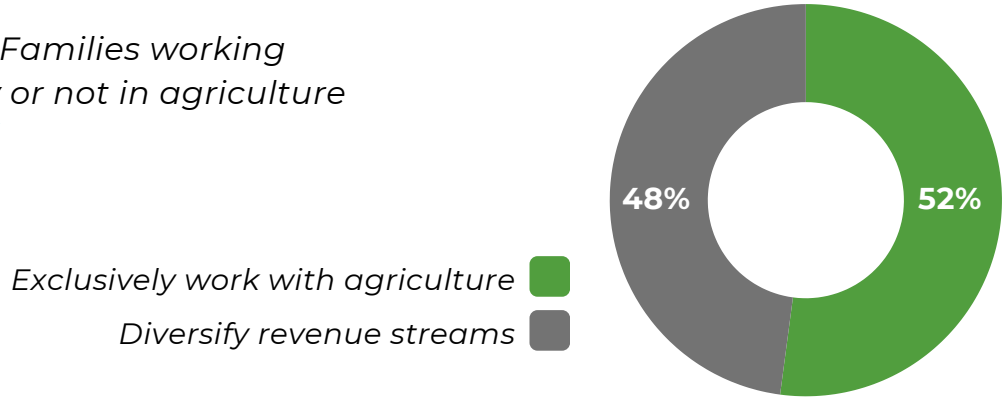
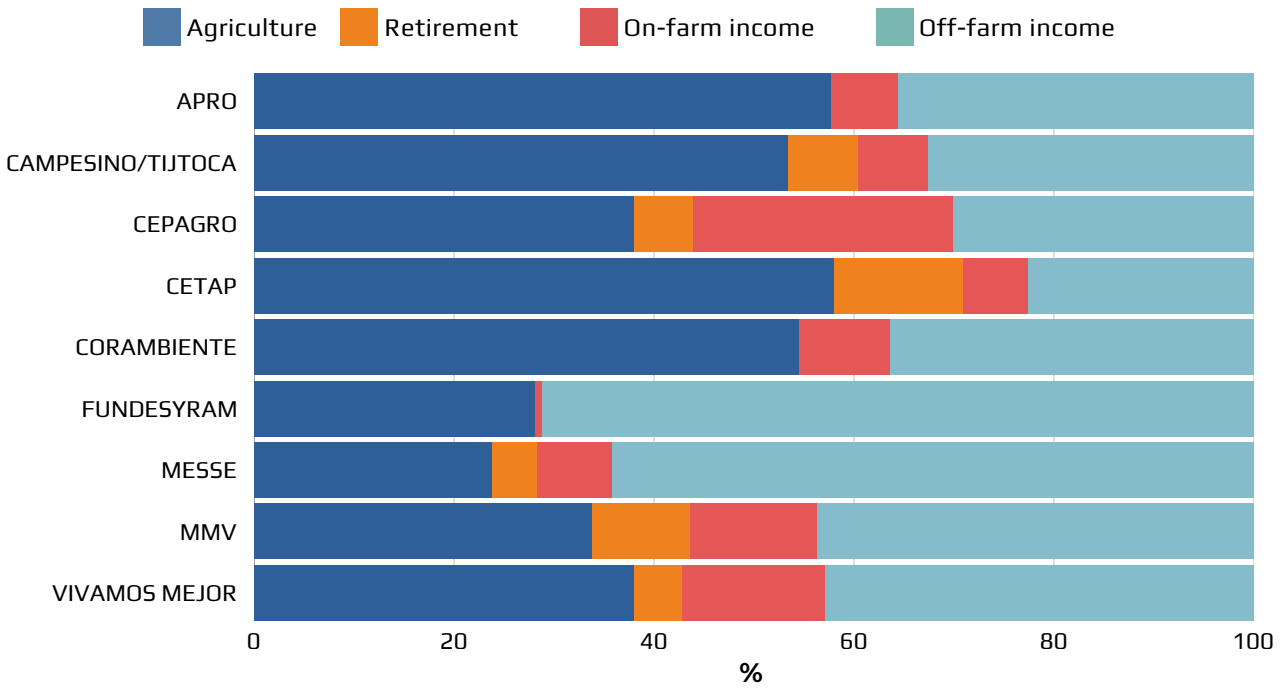


Figure 15: *Variety of family income sources, per organization (N=286).*



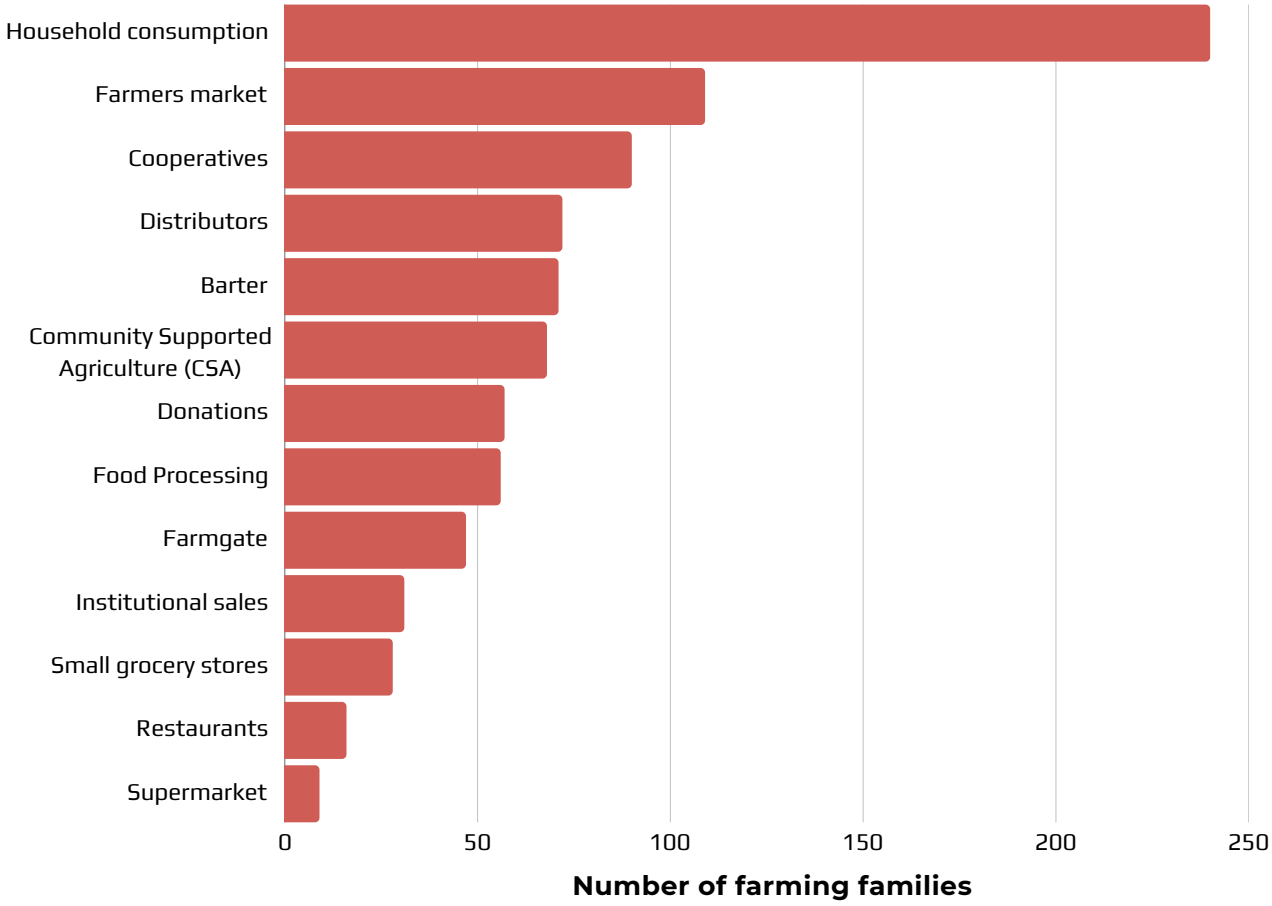
Agroecology aims for economic sustainability, and the above graphs show that the percentage of families dedicated exclusively to agriculture is relevant. However, in the seven countries, almost half of the families (48%) depend on other sources of income. While agricultural services and agricultural multifunctionality indicate diversity as a development strategy, they also reflect the challenges of agroecological production in the current context.

**By processing, we refer to the processing of food, such as the roasting of coffee, the transformation of cocoa into chocolate, or fresh fruits into frozen pulps, etc.*

Marketing

Families were also asked about how their production is distributed and commercialized. Most farmers reported self-consumption as a primary destination of their production, followed by farmers markets and cooperatives. The distribution channels with the least prevalence were small grocery stores, restaurants and supermarkets.

Figure 16: *Variety of marketing and consumption channels (N=286).*



An interesting finding was the increase in the number of families that indicated self-consumption as a distribution channel. Although production for self-consumption is generally invisible in public policies, it represents a significant savings for families' monthly income. Although it is difficult to measure or define this production, it is a common strategy and plays important roles in the social, economic and food reproduction of families. It is also fundamental for the maintenance of rural households, regardless of their level of market integration.

Urban Center Proximity

The proximity of family farm units to urban centers and consumer markets can affect marketing and production decisions. The following graphs present data on the average distance and travel time from the agricultural units to the nearest urban centers.

We considered the proximity of each farming family in our project to the nearest urban center, defined as a municipality with more than 10,000 inhabitants.

The values presented in Figures 17 and 18 represent the average distance and travel time from each agricultural unit to the nearest urban center.

Figure 17: *Average distance from agricultural units to the closest urban centers, categorized by organization.*

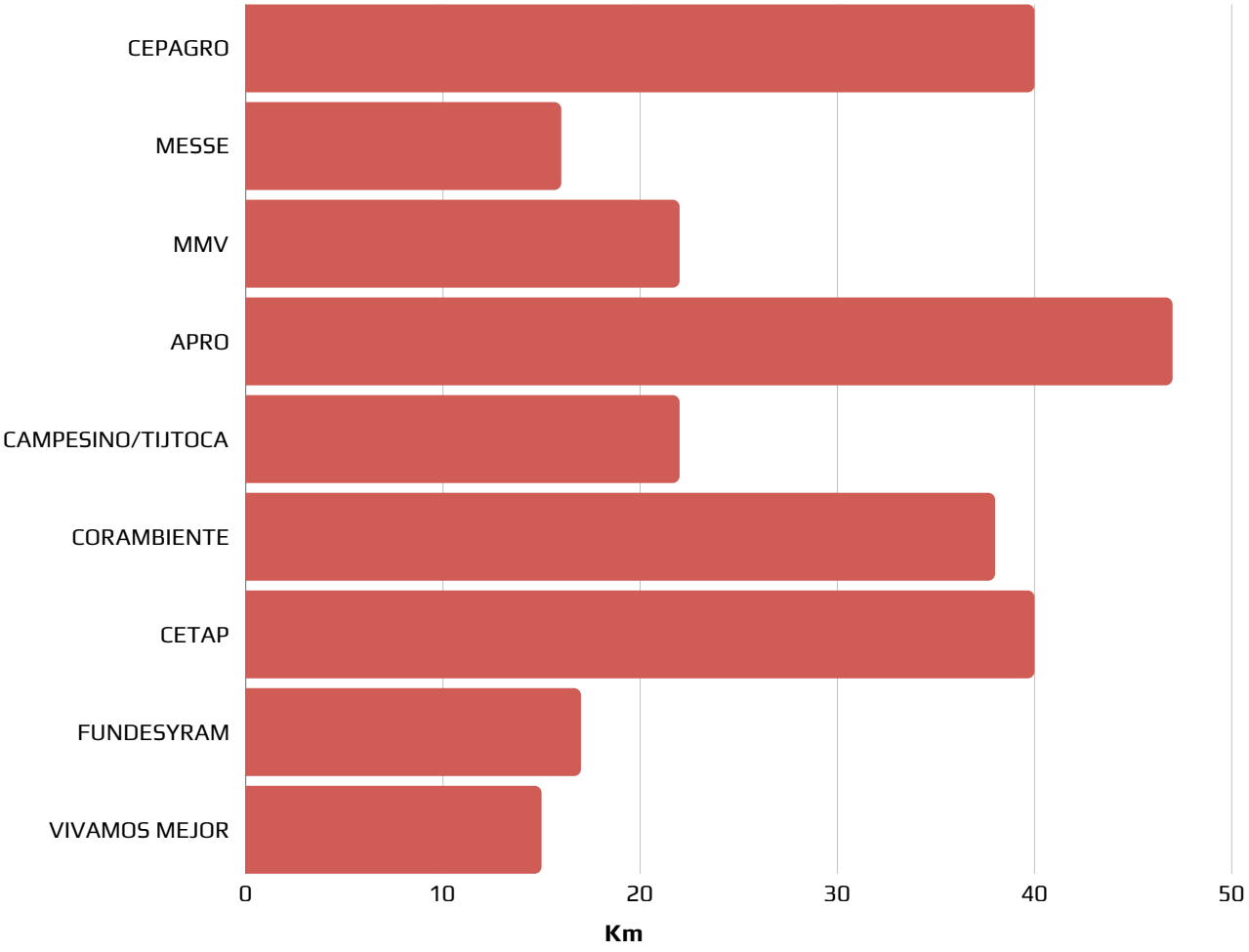
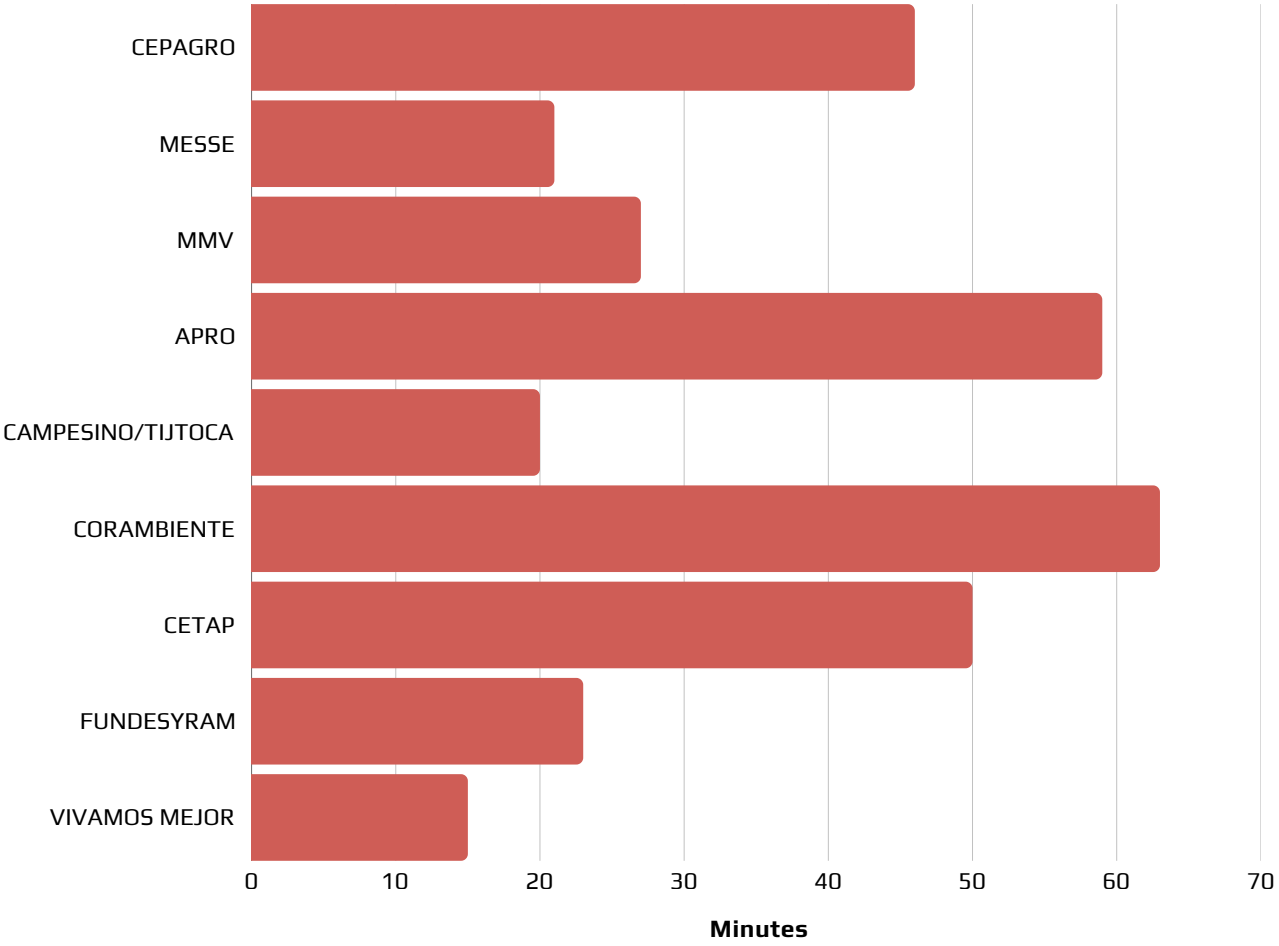


Figure 18: *Average travel time from agricultural units to the closest urban centers, categorized by organization.*



Analyzing data on distance and travel time from family farm units to urban centers is important, as well as whether distance to markets affects production diversity. Research in other contexts indicates that distance to market can correlate with levels of crop diversity. In previous studies, researchers found that when production is oriented to external markets, farm units closer to urban centers tend to have greater crop diversity. However, when the primary purpose of production is for self-consumption, the opposite effect occurs. The farther away farm units are from urban centers, farms tend to have great crop diversity to overcome difficulties in accessing food to ensure a varied diet.

In addition, members of the organization Corambiente make the following reflection: the greater the distance that farmers must travel to market their production, the more difficult it becomes to package the produced food. This may lead families to prioritize the production of certain crops over others.

Production and consumption

265 farming families responded to inquiries about their connection with consumers. Among them, 67% indicated maintaining a direct relationship with consumers through various means such as barter, direct sales (CSAs and farmers market), or other methods. When questioned about the primary advantage of this direct connection, trust, autonomy, and pricing emerged as the predominant responses.

Figure 19: *Families maintaining a direct relationship with consumers (N=265).*

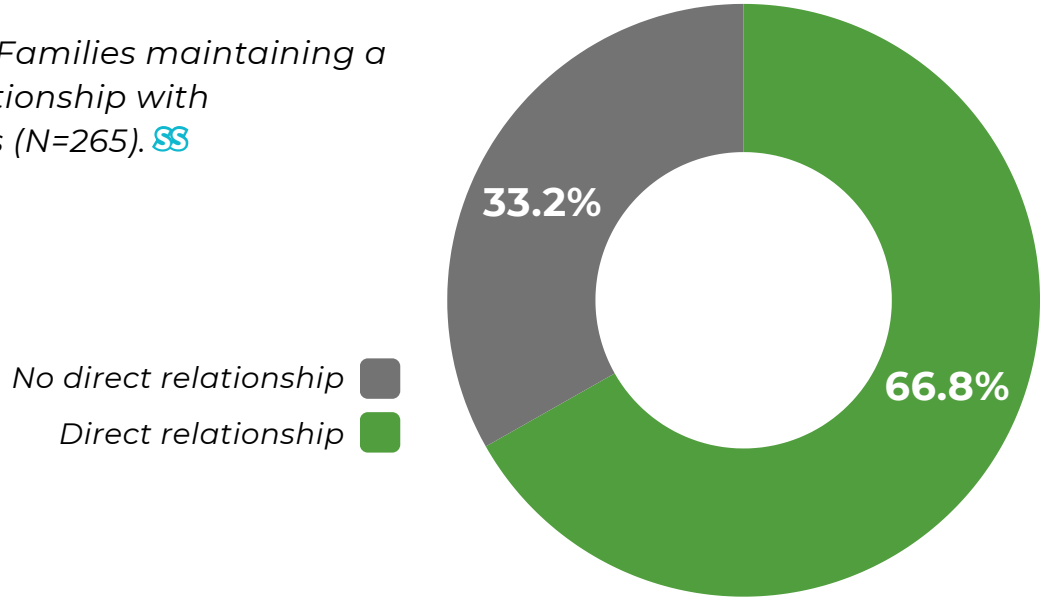


Figure 20: *Primary advantages of the direct relationship (N=265).*

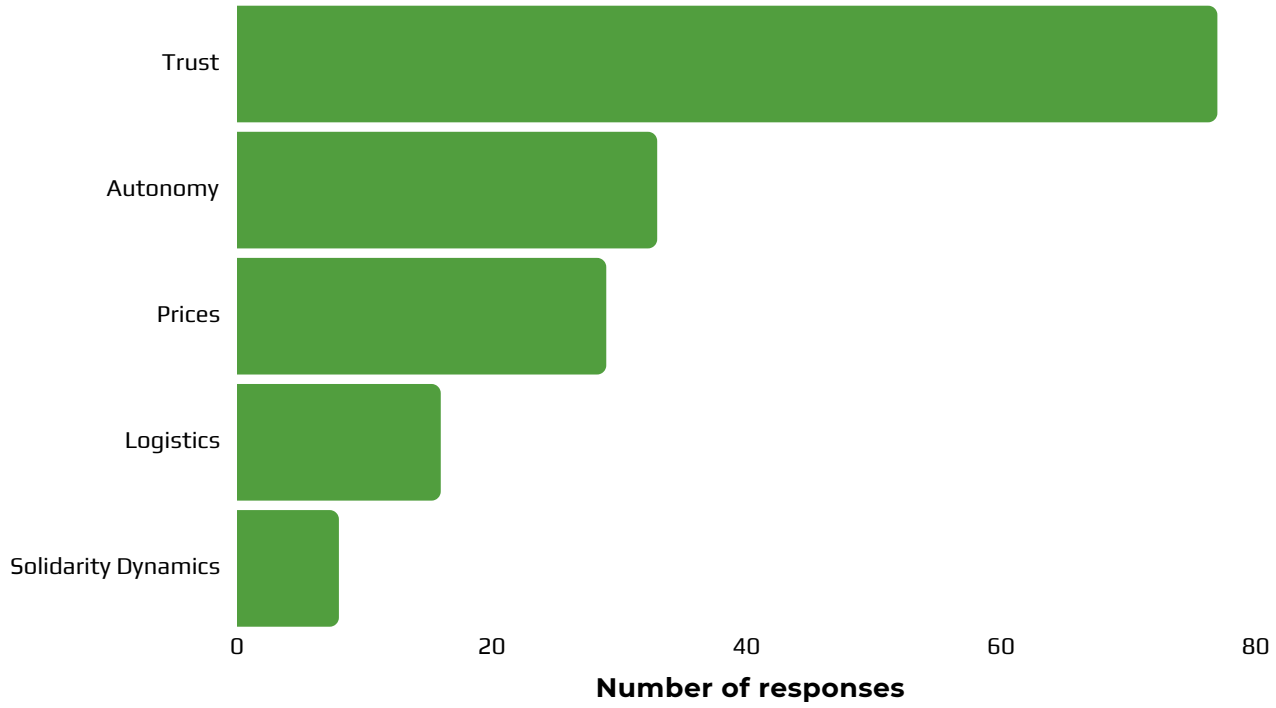
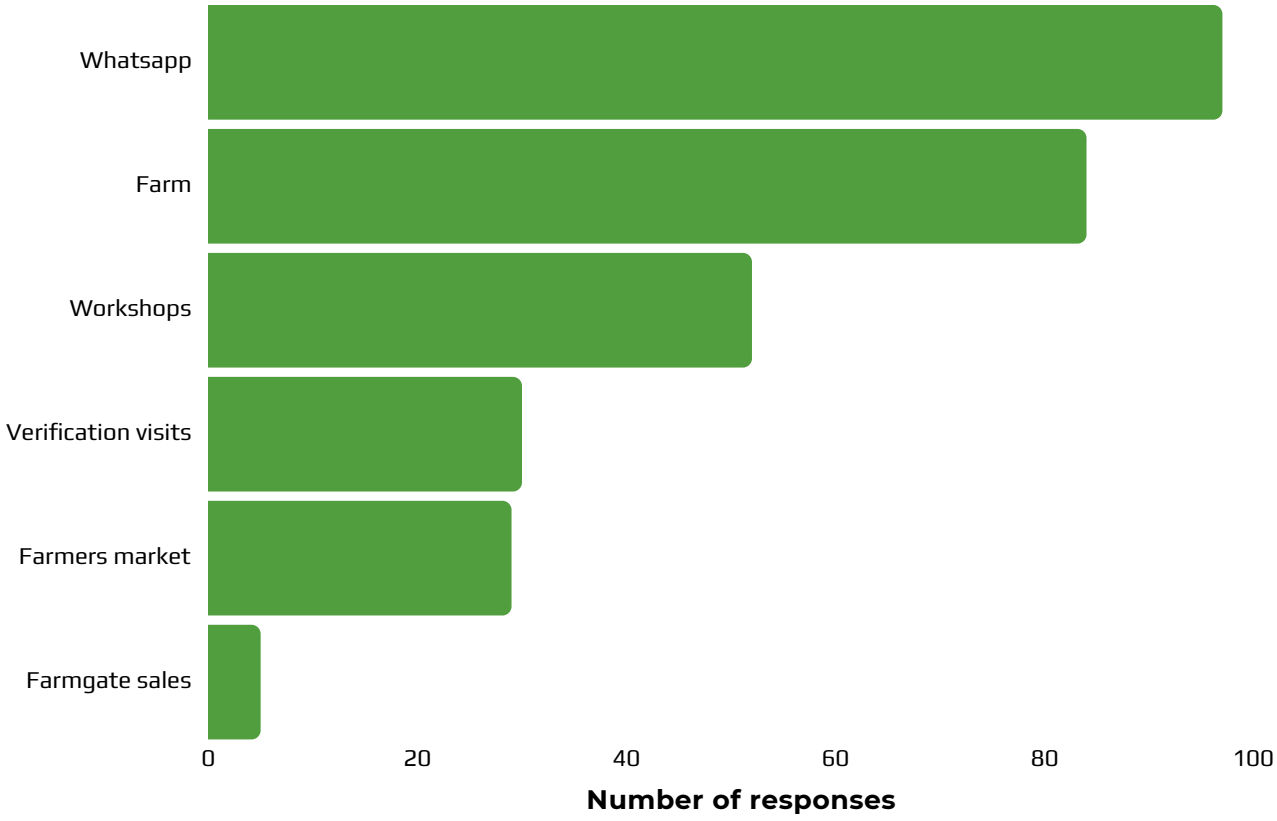


Figure 21: *Location where the direct relationship between producers and consumers takes place (N=265).*



Currently, contact with consumers occurs mainly through WhatsApp. The tool is an open-use software (free to download and use) and represents an important means of creating links between the dimensions of food production and consumption. The use of this technology presents a structuring innovation for socialization between farmers and consumers, as it brings together actors who, at times, were distant (geographically and relationally).

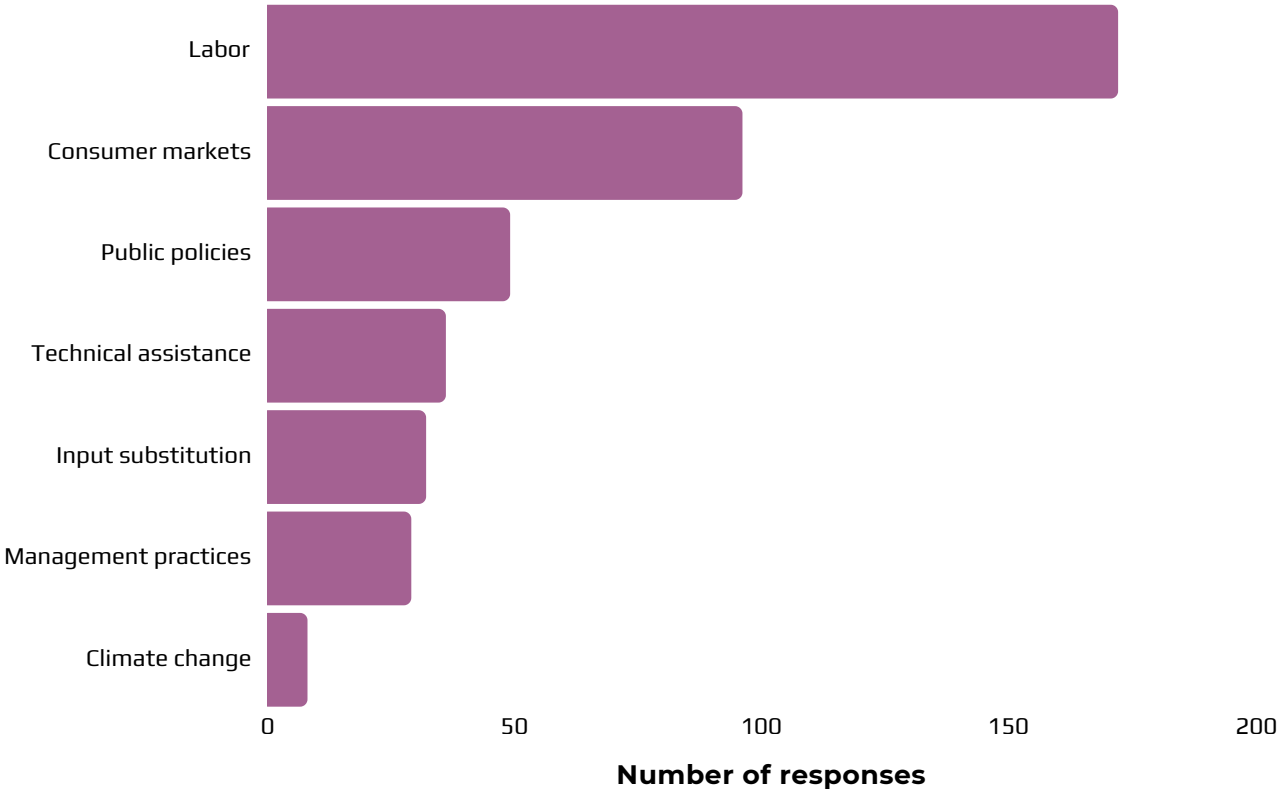
Challenges in agroecological production

Agroecological production, while offering numerous environmental and social benefits, faces several challenges. Understanding them from the perspective of farm families is essential to inform public policies and advance agroecological transition processes.

During the application of the questionnaire in SurveyStack, families answered the following question: “What are the two main constraints your family faces in agroecological production?”. The main limitations highlighted by the families in the project in 2024 were labor,

consumer market and public policies. Compared to previous years, climate change appears for the first time as a limitation to agroecological production.

Figure 22: *Primary constraints for agroecological production (N=286).*



Labor remains a significant challenge for agroecological production. Conversations with families highlight the struggle to find skilled and willing workers. Changes in family sucession patterns, along with the aging population in rural areas, exacerbates this issue. Creating opportunities for rural youth and improving access to specialized machinery for agroecological production are essential steps to alleviate labor demand.

In terms of marketing channels, agroecological production lacks established structures for producers to differentiate their products. They frequently resort to conventional channels, which do not distinguish between agroecological and conventional products, resulting in uniform pricing. Developing alternative marketing channels and promoting institutional procurement of agroecological foods is essential.

The market niche for "alternative and differentiated" foods forms a movement that challenges the hegemonic standards of the global agri-food system. It is based on social collaboration between food production and consumption, the balance of ecosystems, care for nature, and quality of life. These principles extend beyond profitability and the unbridled use of resources. In essence, marketing has the potential to contribute to the redesign of agri-food systems through the social construction of markets for healthy foods at fair prices.

Public policies also stand out as a challenge for agroecological production, meaning they are insufficient or inadequate to meet the needs of agroecological family farming. Considering that agroecological systems bring social, economic and environmental benefits to society as a whole, it is necessary to incorporate agroecology in a cross-cutting manner in policies on access to credit and financing, support for research and innovation, marketing, protection and enhancement of agroecosystems, among others.

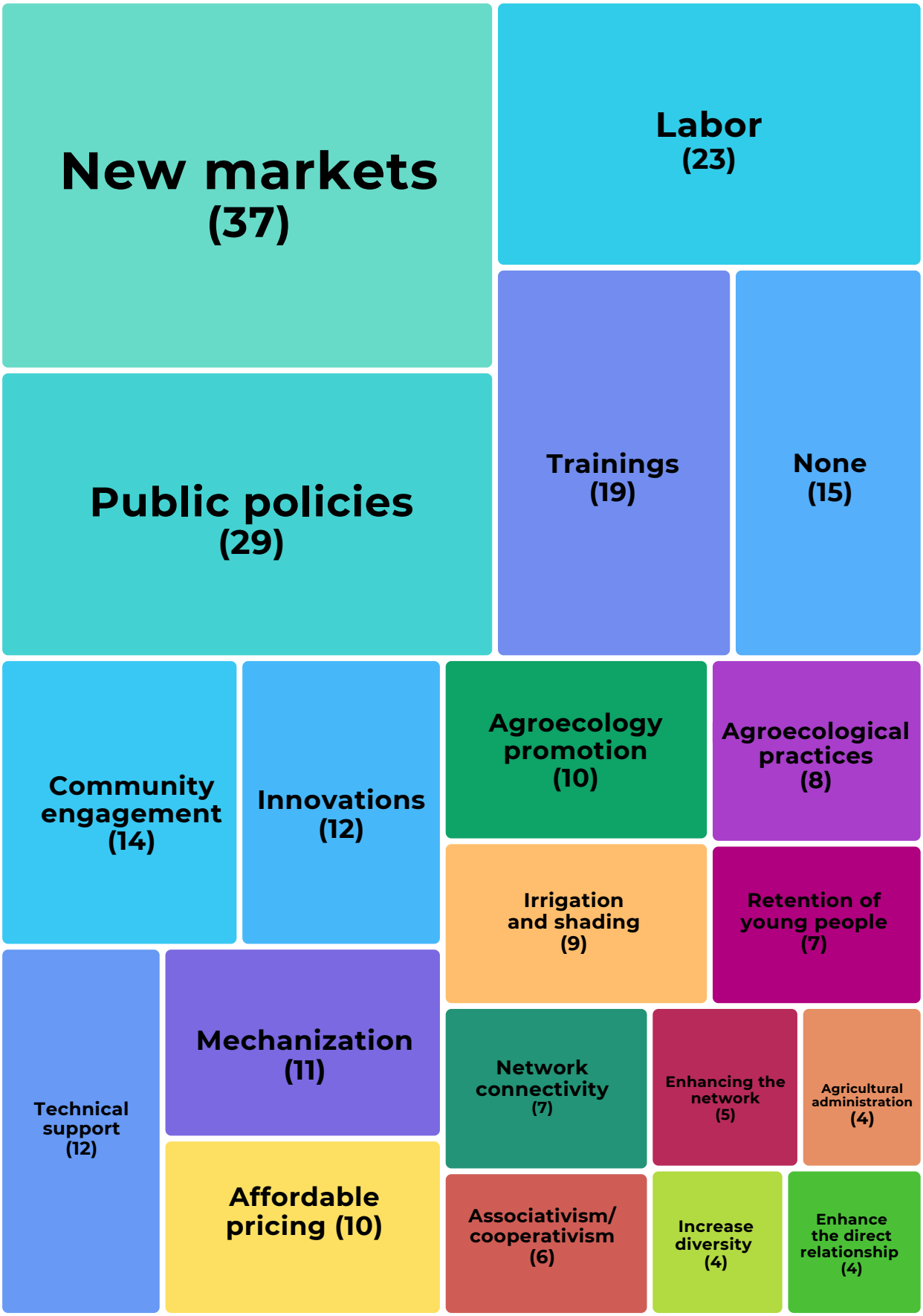
Climate change represents a new and significant challenge for agroecological production. Ecological imbalances, such as an increase in invasive species, changes in crop cycles, water stress, excess rainfall and the occurrence of extreme weather events, are some of the problems resulting from climate change. This highlights the importance of sustainable practices, which can help farm families adapt to the adverse effects of climate change.

Potential solutions

In dialogue with the challenges mentioned in the previous question, the families also responded to the question “What is your suggestion to face and overcome these limitations?”. The main terms used to answer it are presented in Figure 23.

Unsurprisingly, the three main areas of attention - the creation of new markets, the construction of public policies that strengthen agroecology, and the search for skilled labour - are directly linked to the main challenges.

Figure 23: *Key terms utilized to address the query: "What is your recommendation for confronting and surpassing these constraints?" (N=286).*



Gender

The following are some aspects of gender relations in the agricultural units, including decision-making and the division of agricultural and domestic work. It is important to note that all the families participating in this action research are composed of both male and female members. The questionnaires did not identify people with other gender identities, such as non-binary, for example.

Figure 24: *Gender-based Decision-making (N=286).*

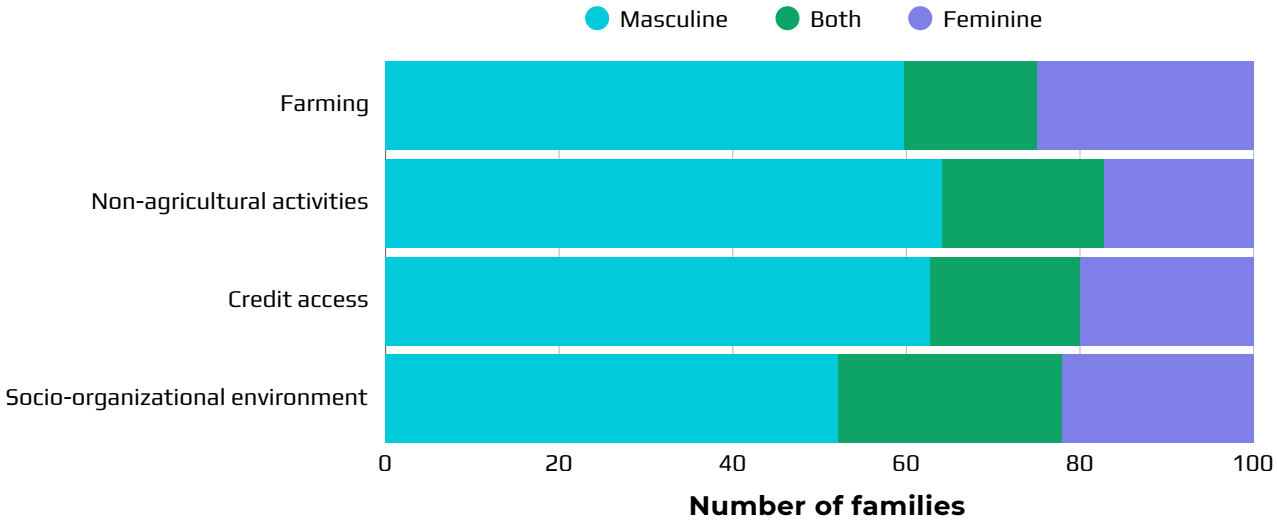
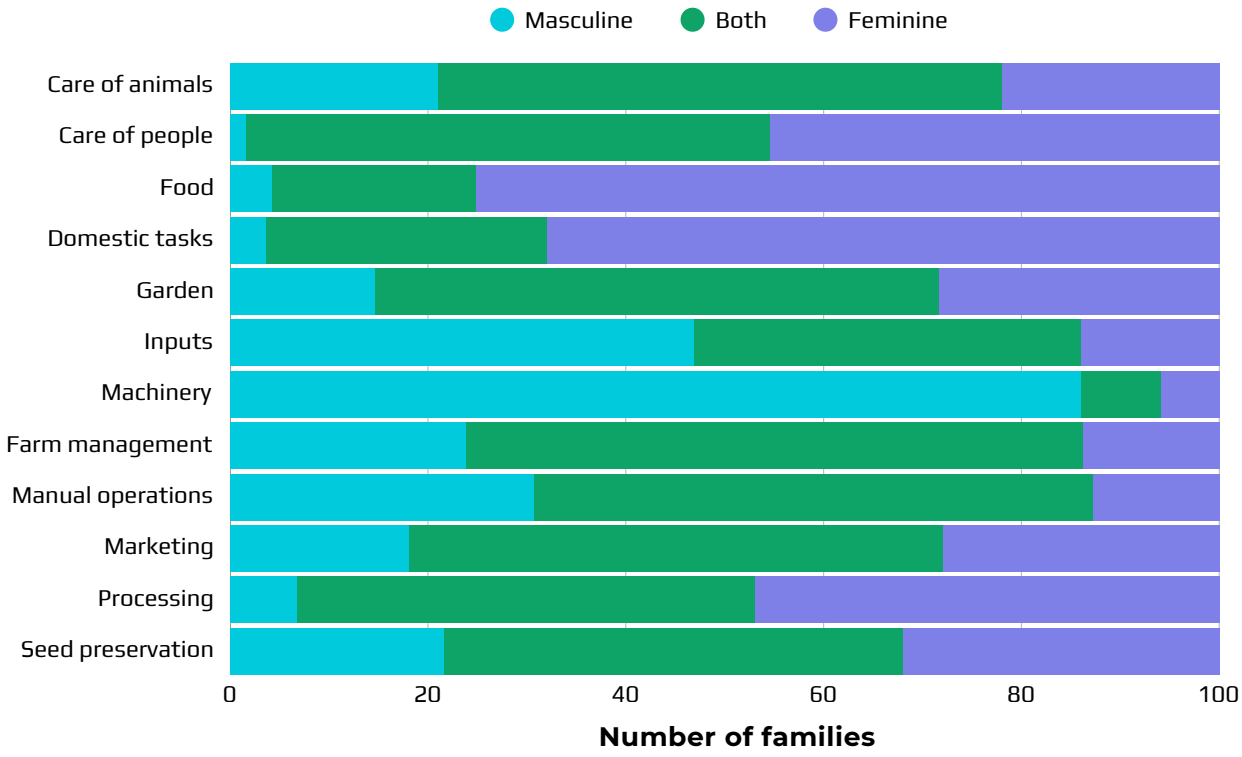


Figure 25: *Task distribution by gender (N=286).*



Retention of youth in agroecology

Rural exodus, or the out-migration of sons and daughters of family farmers, is a recurring concern among the participating organizations. Without generational renewal in the countryside, there is a growing risk of abandonment of traditional agricultural practices and loss of knowledge and techniques essential for family farming. This threatens food and nutritional sovereignty and security in the countryside and the surrounding cities.

In this year's survey, we asked about the activities of young people on participating farms including their degree of participation in socio-organizational spaces, influence on decision-making in the family agricultural unit and their level of empowerment in terms of financing and autonomy in terms of public policies.

Out of the 313 families surveyed, 159 (55.6%) reported the presence of Youth (ages 15-29) in the agricultural unit (Figure 26).

Figure 26: *Presence of youth in agricultural units (N=286).*

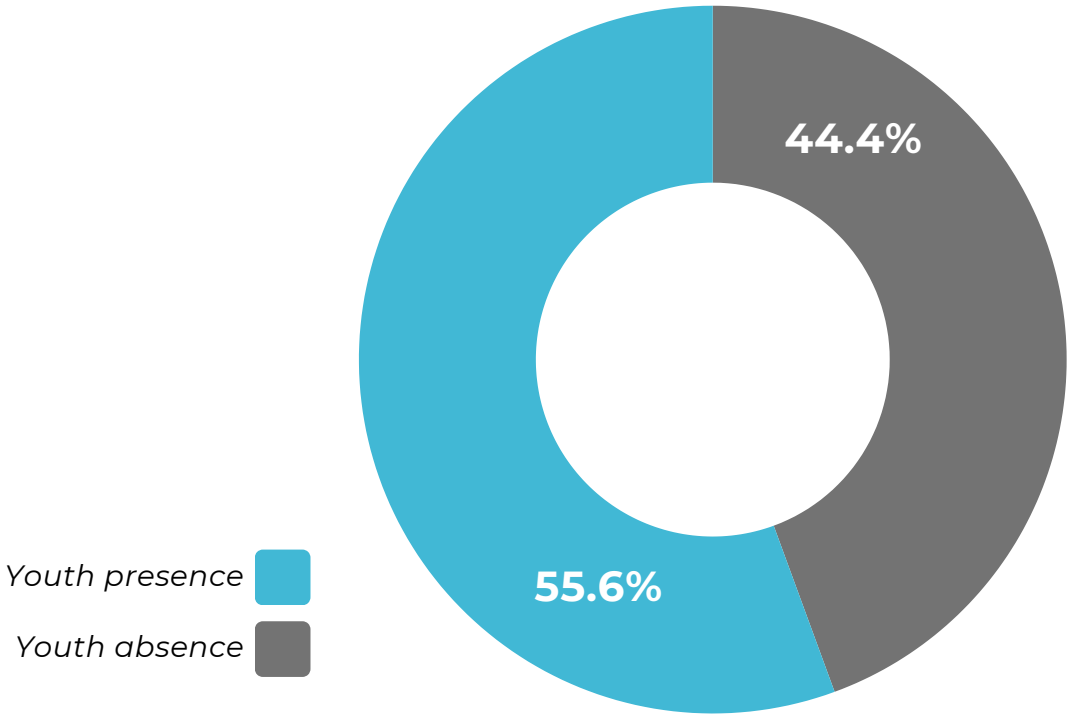
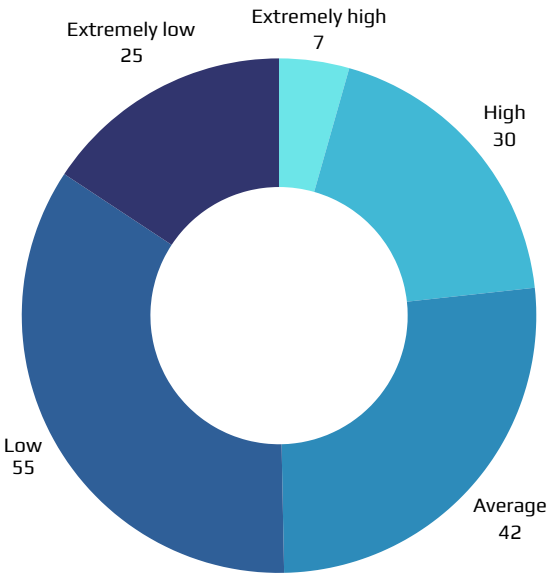
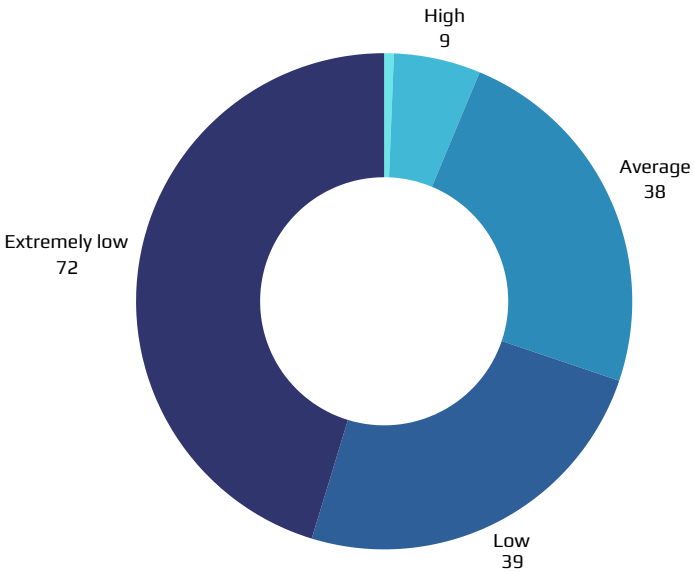


Figure 27: *Youth Participation and Empowerment Levels (N=159).*

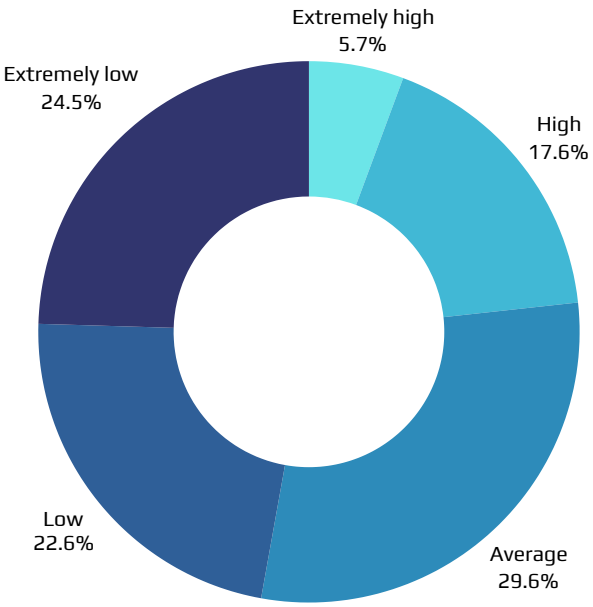
Level of financial independence



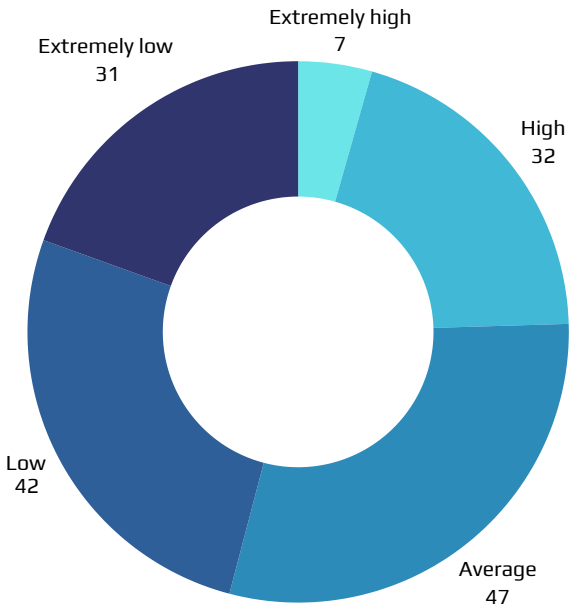
Level of access to public policies



Level of engagement in socio-organizational spheres

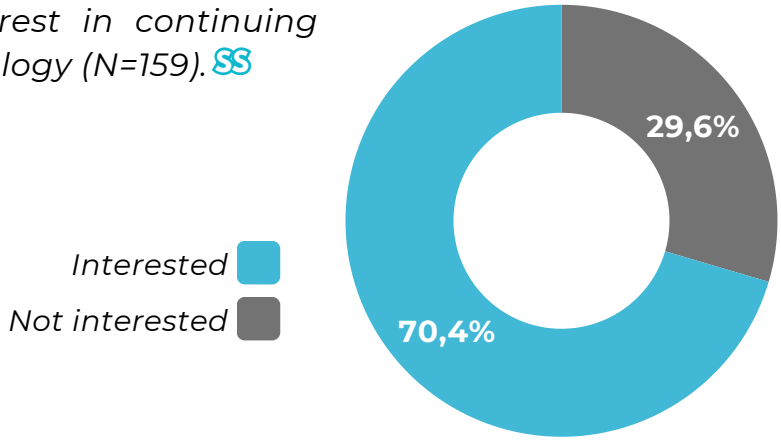


Level of involvement in agricultural unit decision-making



We surveyed the families regarding the intention of their young family members to engage in agroecological farming. The majority (70.4%) expressed interest, whereas 29.6% indicated disinterest in continuing in agriculture (Figure 28).

Figure 28: *Youth interest in continuing involvement in agroecology (N=159).*



We examined the interest of young individuals in persisting with agroecology in agricultural establishments with varying income sources. In both scenarios, the majority of young people expressed a desire to continue in this field.

When analyzing the correlation between the level of financial independence among young individuals and their inclination to pursue a career in agroecology, a pattern emerged: higher financial independence corresponded to increased interest in persisting in the field of agroecology.

Figure 29: *Correlation between the enthusiasm of young individuals to pursue a career in agroecology and their level of financial independence (N=159).*

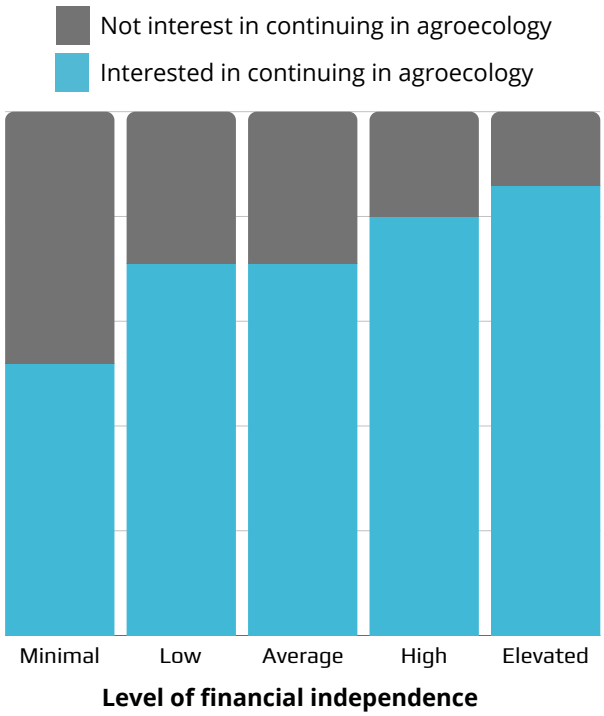
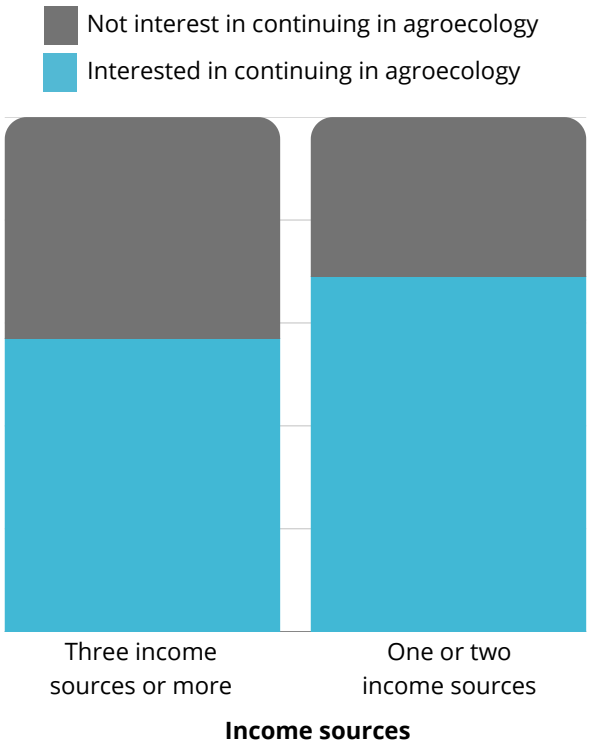
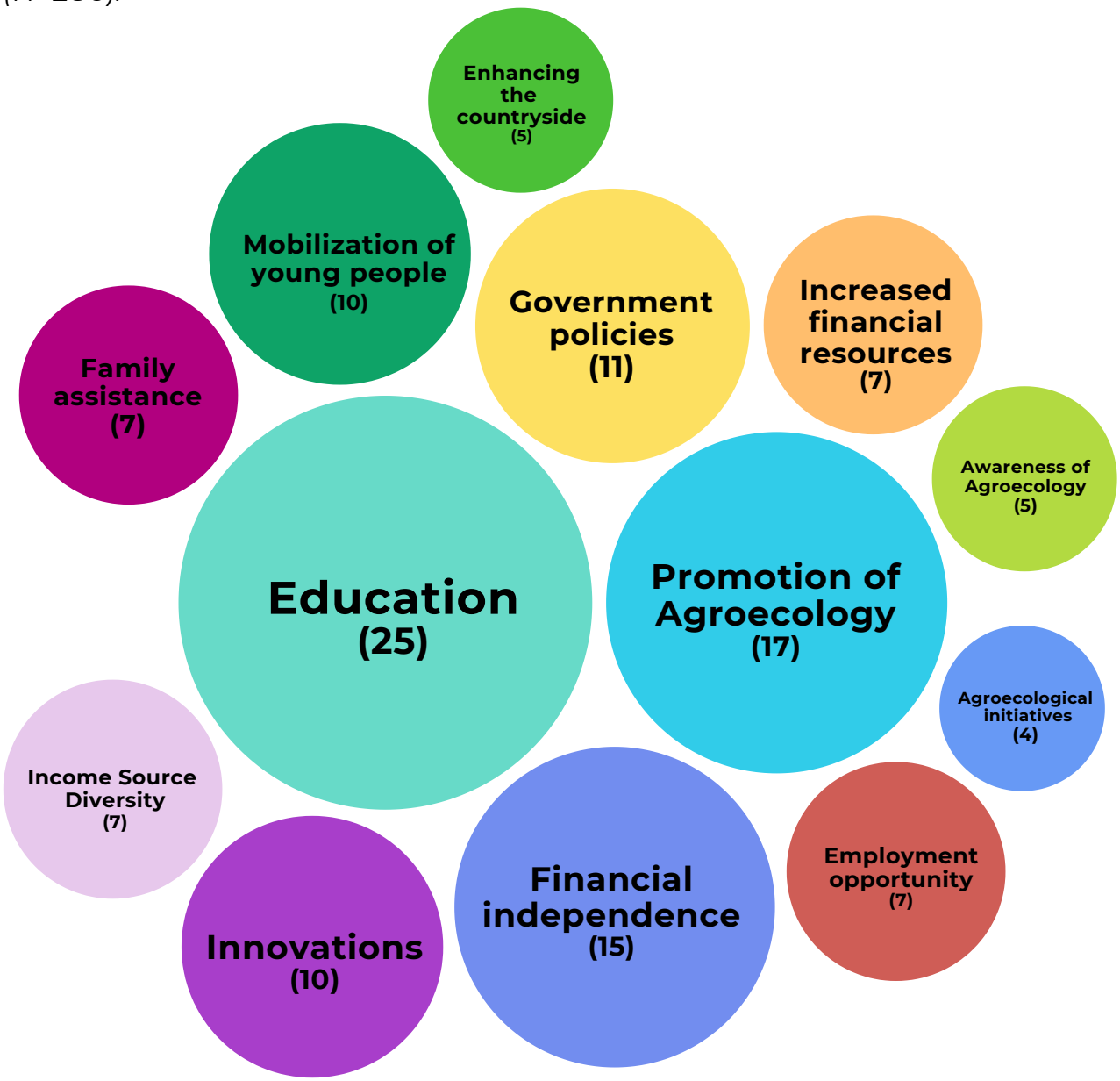


Figure 30: *Correlation between the interest in pursuing a career in agroecology and the variety of family income sources (N=159).*



The mobilization of youth in agroecology in Latin America is recognized by the organizations of the Steering Committee and is influenced by various factors, including the absence of economic incentives and supportive public policies, urban migration pressures, and rural devaluation. Moreover, challenges like inadequate infrastructure, climate change, and insufficient education and training in agroecological practices contribute to pushing young individuals away from rural areas, jeopardizing the sustainability and future of agroecology in the region. In light of this, the question was posed: "How can the retention of young people in rural areas be enhanced?" The responses included the following keywords, categorized based on their frequency.

Figure 31: *Primary terms employed by youth in responding to the query: "How can we boost the retention of young individuals in rural areas?" (N=286).*



Access to Technology

The following figures demonstrate levels of access to various aspects of technology, including internet access and bandwidth type and quality (both wireless and cellular). Over the last three years of the project, there were no significant changes in the form of Internet access, nor the quality and speed of the signal. Among the families interviewed, 84% said they were able to access cellular bandwidth on their farms, 90% said they knew how to use a smartphone.

Figure 32: *Location of internet access (N=286).*

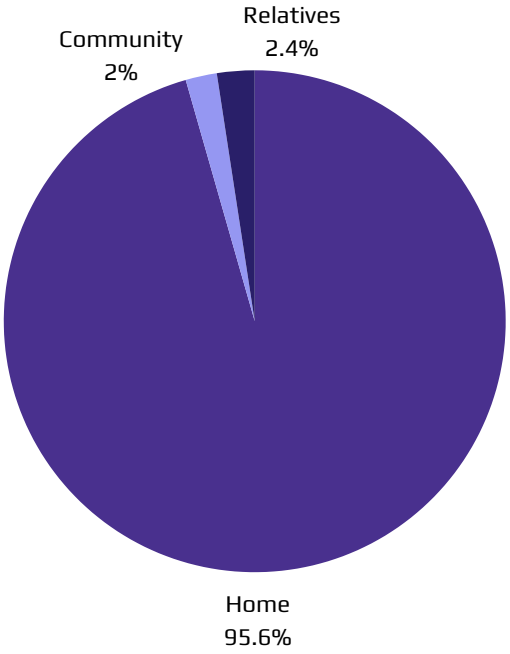


Figure 33: *Internet Network Type (N=283).*

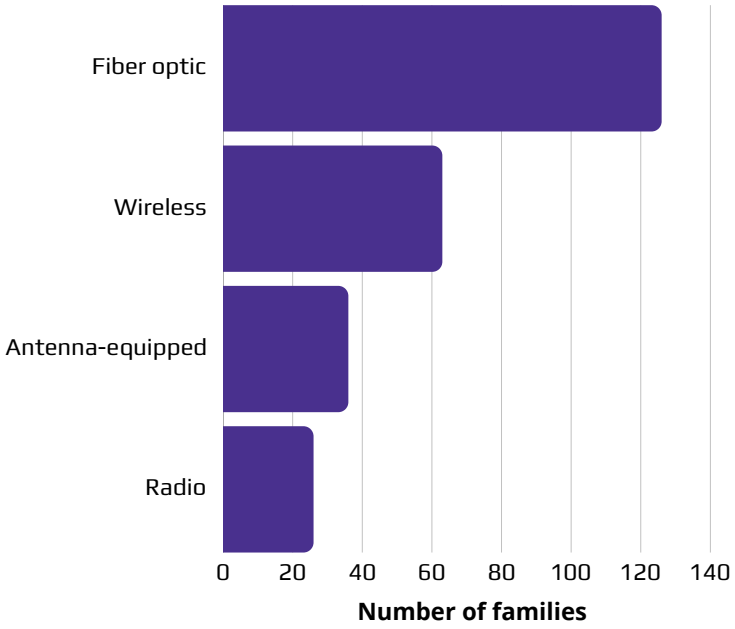


Figure 34: *Cellular Signal Quality (N=286).*

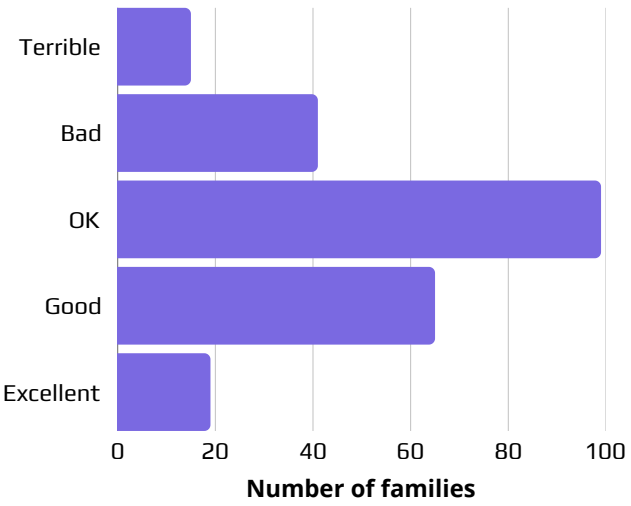
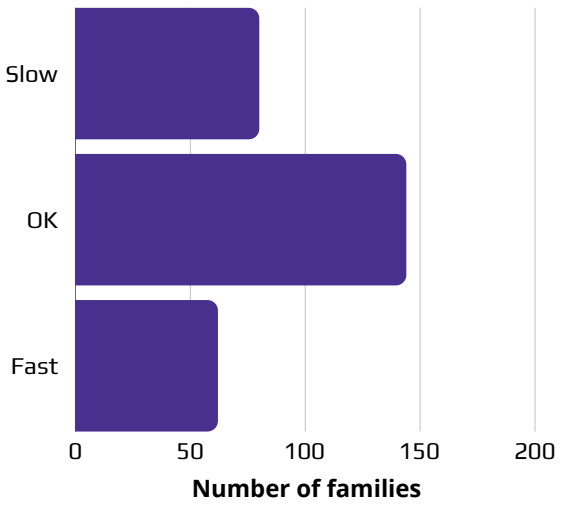


Figure 35: *Internet Speed (N=286).*



Acknowledgements

This project is only possible thanks to the participation of each farmer who has dedicated their precious time to share with us valuable information and practical, agroecological and ancestral knowledge. They are rural workers, mostly organized in networks, movements, and cooperatives such as the Agroecology Network Povos da Mata, Rede Ecovida de Agroecologia, Red Agroecológica de El Salvador (RAES), Movimento Estadual dos Trabalhadores Assentados, Acampados e Quilombolas da Bahia (CETA), Associação Embaúba de Produtores Orgânicos da APA Itacaré-Serra Grande, Asociación Oñoiru, Pastoral Social de San Pedro del Paraná, Asociación de Productores Orgánicos (APRO) from Paraguai, Cooperativa La Colmena Campesina and the Escuelas para el Bienestar en Hueyotlipan, Tlaxcala, Mexico, Asociación de Mujeres Campesinas de Matanza (ASOCIMUCAM), Asociación de Mujeres Emprendedoras del Municipio de Rionegro and Grupo de Jóvenes Minigua. We thank you for the trust and dedication placed in this collective initiative.

We also thank the students and young scholarship holders of the project, who are fundamental for the collection and systematization of the data that supported this report. We highlight the importance of the project in valuing and supporting the work of these young people, integrating the knowledge of generations and indicating technology as a complementary language capable of enhancing the management of agroecological agriculture.











AGRO
ECO
LOGÍA

construyendo caminos