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REPORT ON RESULTS AND IMPACTS

IFAD IN BRAZIL

2022

Report on Results and Impacts – IFAD in Brazil 2022

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Report on Results and Impacts IFAD in Brazil 2022

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Report on Results and Impacts – IFAD in Brazil 2022

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ABBREVIATIONS AND ACRONYMS

EB – Entropy Balancing

IFAD – International Fund for Agricultural Development

MPI – Multidimensional Poverty Index

PDHC – Policy Coordination and Dialogue for Reducing Poverty and Inequalities in Semi-Arid Northeast Brazil

PDT – Rural Business for Small Producers Project

PPF – Productive Development and Capacity-Building Project in the State of Ceará

PROCASE – Cariri and Seridó Sustainable Development Project

PSA – Rural Sustainable Development Project in the Semi-arid Region of Bahia

PSM – Propoensity Score Matching

PVSA – Semi-arid Sustainable Development Project in the State of Piauí

PREFACE

Since 2012, IFAD's activities in Brazil have been divided into six investment projects and four donations. In the investment category, there are: PROCASE (Paraíba); PVSA (Piauí); PPF (Ceará); PDT (Sergipe); PSA (Bahia); and PDHC (several states). Donation projects are the Adapting Knowledge for Sustainable Agriculture and Access to Markets (AKSAAM), Semear Internacional, Innova and Daki – Semiárido Vivo.

In 2021, the AKSAAM Project team developed the publication "Report of Results – IFAD in Brazil 2020". That document presented the results of the work of the International Fund for Agricultural Development (IFAD), highlighting the accumulation of physical and financial assets, the development of human capital, the strengthening of institutions and the use and conservation of natural resources. These are fundamental elements in the search for sustainable development. However, there was a big gap to be filled: the measurement and analysis on the effectiveness and efficacy of these projects.

In 2021/2022, investment projects were carrying out their impact evaluations. In this sense, a great opportunity arose for the AKSAAM team to contribute to the management of knowledge on the Monitoring & Evaluation theme, thus filling the aforementioned gap. The existence of a large primary database in two different time periods made it possible to compare beneficiaries (treated) and non-beneficiaries (control), within each project

This document presents an innovative contribution to the analysis of poverty in rural areas: the development of a Multidimensional Poverty Index (MPI) and the contribution of each of its dimensions. There is already a broad consensus in the literature that poverty is not only associated with lack of income. The poor are subject to other deprivations, associated with a lack of human and social capital, nutrition and food security, housing conditions and sustainability. In general, the results showed a considerable reduction in the multidimensional poverty of the beneficiaries in the period analyzed.

The report is organized into five chapters, in addition to this preface. The first chapter briefly describes IFAD's investment projects in Brazil. After that, some theoretical elements that helped to build the results and analysis of the report are highlighted. The third chapter presents the methodological approaches used in the study. The results and impacts of the projects are presented in the fourth chapter. Finally, the final remarks are listed, with a quick summary of the study. By presenting the results and impacts related to the projects financed by IFAD in Brazil, it is intended that the document gives an account of its performance to society.

Finally, two aspects are extremely relevant to be observed when reading this document. First, it is not appropriate to compare results and impacts across projects. These present different designs, objectives, resources and realities. Second, the absence of impact does not mean lack of result or an undesirable outcome. Part of the expected impacts demand a period of time for the maturation of the actions developed in the projects that extrapolate the analyzed period.

1

INITIAL CONSIDERATIONS

1.1 IFAD IN BRAZIL

Since the 1980s, IFAD has collaborated with the federal and state governments of Brazil, investing in rural development actions conducted on the semi-arid region of the country. Brazil is one of the countries with the highest number of rural development projects carried out in partnership with IFAD.

In Brazil, IFAD-supported operations characteristically provide family farmers with the appropriate tools for their development in the challenging semi-arid environment through the seek for technical innovations and the best agricultural practices. Up to 2022, IFAD has supported

13 PROJECTS,

whose investments total approximately

USD1.18 BILLION,

Of which,

24%

were financed by the IFAD.
More than

615,000

families were or still are benefited by the actions of IFAD-supported projects

Among the operations that have been financed by IFAD in Brazil, it can be highlighted the conduction of:

6 PROJECTS

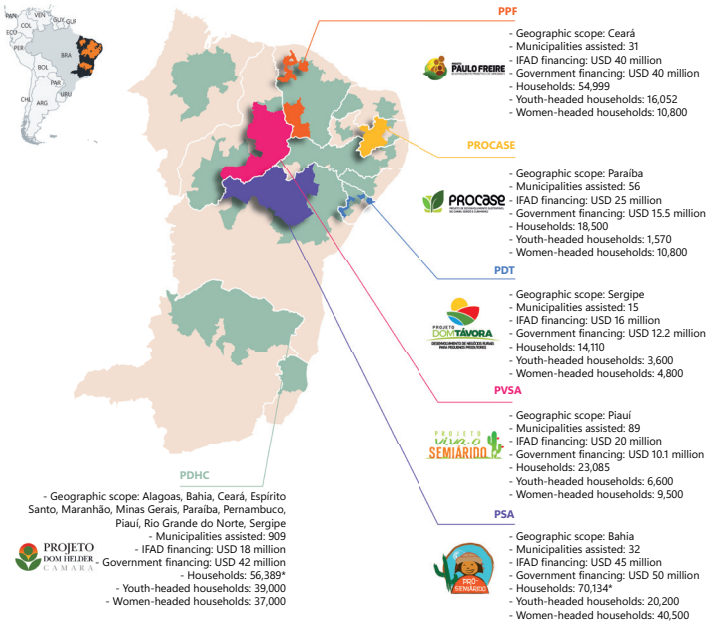
that benefited more than

250,000

families, amounting to an investment greater than

USD 450 MILLION

concentrated in the Northeast region and parts of the states of Minas Gerais and Espírito Santo.



Therefore, IFAD joins efforts with public agencies, civil society organizations, rural social movements, businesses and other international organizations **to achieve a common objective: the promotion of sustainable and inclusive rural development via increased production and income, thus facilitating the access to essential services, strengthening organizations and connecting target audiences to markets** (IFAD, 2017a).

All IFAD-supported projects in the country focus on **supporting and promoting family farming and the most vulnerable groups, such as indigenous and quilombola (Afro- descendent) communities, agrarian reform settlers, women and youth** (IFAD, 2017b).

PROCASE
PROJETO DE DESENVOLVIMENTO SUSTENTÁVEL DO CARIRI, SERIDÓ E CURIMATAÚ

More at:
https://www.procase.pb.gov.br/

PROJETO viva o SEMIÁRIDO

More at:
https://vivaosemiarido.org.br/

PROJETO PAULO FREIRE
DESENVOLVIMENTO PRODUTIVO E DE CAPACIDADES

More at:
https://www.sda.ce.gov.br/ugp-paulo-freire/

PROJETO DOM TÁVORA
DESENVOLVIMENTO DE NEGÓCIOS RURAIS PARA PEQUENOS PRODUTORES

More at:
https://www.seagri.se.gov.br/projeto/2/projeto-dom-tavora

PRÓ-SEMIÁRIDO

More at:
http://www.car.ba.gov.br/projetos/pro-semiarido

PROJETO DOM HELDER CAMARA

More at:
https://www.gov.br/agricultura/pt-br/assuntos/agricultura-familiar/projeto-dom-helder-camara

1.2 OBJECTIVES

Given the importance of IFAD's actions for the development of the semi-arid region of Brazil, this report aims to:

PRESENT, FOR EACH PROJECT SUPPORTED BY THE IFAD IN BRAZIL, THE MAIN RESULTS AND THE ESTIMATED IMPACTS.

It is worth emphasizing that each project has its particularities (such as geographic scope, target audience, local demands, partnerships, etc.). Therefore, this report does not aim at comparing projects. The objective here is to present the impacts and the results achieved by each project.

1.3 OUTCOME EVALUATION VS. IMPACT EVALUATION

In order to analyze the outcome and impact indicators (socioeconomic and agricultural), we present a summary of the changes observed for the main indicators assessed in the impact evaluation report of each project analyzed. Therefore, it is fundamental to emphasize the conceptual differences between outcomes and impacts.

Outcomes

A synonym for performance, the term outcome refers to project's outputs, which are foreseen in the project's goals and are derived from its particular production process. Outcomes are the most direct results of a project.

Therefore, the evaluation of the effectiveness or performance of a project concerns the analysis of its contribution to the achievement of objectives and goals, connecting its activities to the initial, intermediate and final outcomes initially expected.

Impacts

The term impact refers to other consequences of the project, expected or not, that affect the social and institutional environment in which it took place. This results from the fact that impacts do not relate directly to outcomes.

Impacts can vary in time and intensity. They can also spillover, reaching areas other than those where the intervention took place. Therefore, a "impact evaluation" aims to measure the impact of interventions on the outcome variables of interest.

Therefore, it is observed that the outcome and impact evaluations have different aspects, which are addressed in this report.

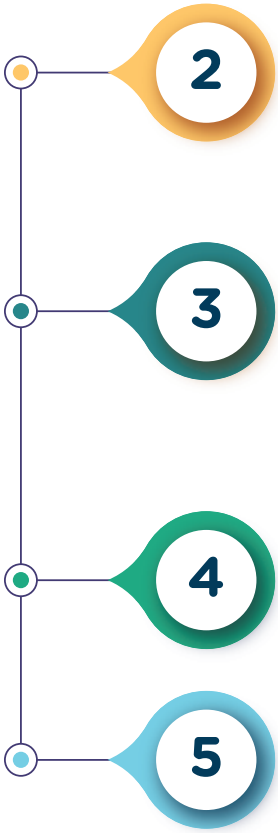
1.4 CONTRIBUTIONS

This report contributes by summarizing information regarding the main projects supported by the IFAD in the poorest region of Brazil. It is provided an understanding of the most relevant characteristics of these projects, considering their specificities in terms of geographic scope, audience and methodology, among others.

The document also contributes by presenting, for each project analyzed, a synthesis of the main outcomes, the lessons learned and the challenges faced, thus making all this knowledge more accessible to the reading audience. The present initiative is important not only for the continuity of this type of policy in the region, but also for the orientation of future actions, which seek to support family farmers and promote rural development in the semi-arid region of Brazil.

1.5 DOCUMENT STRUCTURE

In addition to these initial considerations, this report is divided as follows:



Theoretical Background

The main goal of this section is to objectively and didactically discuss the theories and the main concepts that involve the evaluation of outcomes and socioeconomic impacts, which are directly related to the IFAD projects analyzed in this document.

Methods used to evaluate the outcomes and impacts of IFAD-supported projects in Brazil

In this section, the methods used in the evaluation of projects' impacts are presented in a summarized and schematic way. The evaluation considered data collected through the baseline and endline surveys of each project analyzed.

Outcomes and impacts of IFAD operations in Brazil

In this section, the evaluation of outcomes and impacts of each of the IFAD projects analyzed are detailed.

Final Remarks

The purpose of this section is to finish the document and summarize the main results and general impacts of IFAD projects in Brazil.

2

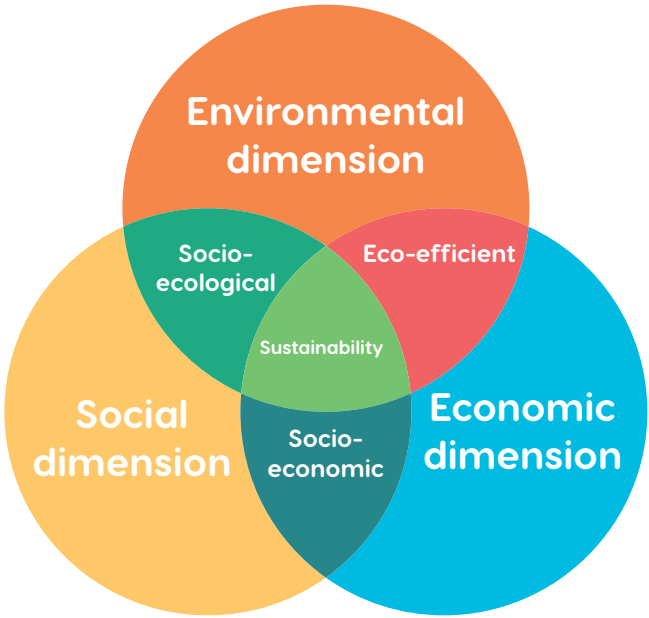
THEORETICAL BACKGROUND

2.1 CHALLENGES FOR DEVELOPMENT AND ITS MULTIPLE DIMENSIONS

Achieving economic progress is clearly a choice made by society, organizations, communities and individuals. As it involves several choices, change is only possible if there is great involvement of society.

Furtado (1984) understand **development as a process of transformation of the world carried out by mankind to meet their needs.** To do so, individuals and societies must **raise their potential to innovate, thus achieving the transformations expected.**

According to Rutherford (1997), the problem of development must be approached from different perspectives. This author defines that development is generally represented by the economic, environmental and social dimensions. When these dimensions are reached, sustainable development is achieved.



Source: Adapted from BCSD-Portugal (2005).

However, as stated by Rutherford (1997), development should not be restricted to these dimensions only, but rather broaden insights to explore other aspects that can also lead to economic growth and development.

Following the idea of multiple dimensions leading to development, Fatás and Mihov (2009) explored, more specifically, the economic and institutional factors that lead to greater economic growth, the so-called 4 I's of development.

Innovation

Fatás and Mihov (2009) state that, in the long term, innovation is the determining factor for the growth of economic well-being. Economic growth is a function of value creation and it is innovation that allows the creation of more value with fewer resources. Economic growth occurs only when goods and services are produced, which add value to people and the community. It is worth highlighting that innovation is one of the main aspects of IFAD-supported operations. By being provided with appropriate tools, through the seek for technical innovations and the best agricultural practices, family farmers are able to improve production, thus generating added value and developing themselves in the challenging environment of northeastern Brazil.

Initial conditions

However, still according to Fatás and Mihov (2009), the poorest communities are further from the technology frontier. Therefore, there are more opportunities to improve production processes, which, in theory, leads to greater growth. Thus, poorer communities tend to grow at higher rates than richer ones, simply because they can benefit from technologies already developed. In this sense, the regions where the IFAD-supported projects operate have the necessary initial conditions for growth at higher rates, as they are far from the technology frontier. However, as will be seen ahead, it is not enough to be far from the frontier. It is also necessary to invest and it is necessary to have strong institutions that increase the security and efficiency of investments.

Investment

Growth must come from increases in productivity or increases in input availability. All this comes from investment in: infrastructure, human capital, knowledge, and equipment, which are the focus of the actions of IFAD-supported projects. If the aim is to develop a poor community, then its citizens and businesses should invest more. If the private sector cannot do this, then the government can step in and directly incentivize or manage the necessary investment. In this context, IFAD, in partnership with the Federal Government of Brazil, has been carrying out large investments in Rural Development Projects in the semi-arid of the Northeast region, with interventions aimed at improving human, social and physical capital.

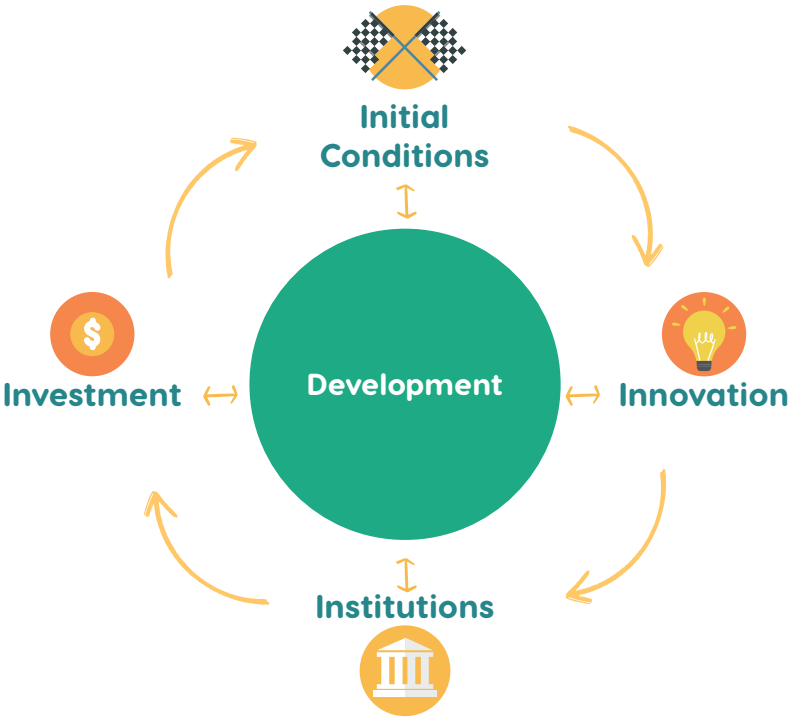
Institutions

According to Fatás and Mihov (2009) it is necessary to mobilize capital - both domestic and foreign - to be invested in actions that will produce changes in the population reality. Investments are made when there are institutions that facilitate them. In poorer regions, governments must aim to create the appropriate business environment. Once such environment exists, individuals and businesses begin to set aside more money for investment, leading to increases in growth. In this sense, IFAD-supported projects play a key role in improving social capital to benefiting communities, which leads to improvements in human capital and in the implicit value of the internal and external connections of a social network, promoting trust and reciprocity in the economy and society. These changes lead to the good functioning of the community, improvements in the business environment, and economic and social development.

The

4 I's

of economic growth are interconnected. The poorest regions, which are further from the technology frontier, have more space for growth and investments as their initial condition generates more opportunities, which allows for greater growth. The investment made in these regions, in turn, incorporates technology into production processes via innovation, generating more value and thus improving the initial condition. Finally, investments are made when there are institutions that facilitate them.



The concept of 4 I's provides a new perspective on development by pointing out different forms to promote it. This perspective is in line with the way IFAD formulates the projects it supports in Brazil. By observing the reality of poor rural communities, identifying the main current needs, as well as the constraints that prevent their development, IFAD seeks to promote actions that lead to improvements in human, social and physical capital. And thereby, possibly generating intergenerational effects that improve the life perspective of future generations.

All this reasoning corroborates a broader approach, developed by Amartya Sen, which became known in the literature as the "capability approach". This approach gained notoriety for considering development as the expansion of freedoms. It is necessary to remove the main sources of deprivation and to take into account multiple dimensions of the human condition. Thus, according to Sen, there are multiple aspects that lead to development.

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DEVELOPMENT

=

ELIMINATION OF FREEDOM DEPRIVATIONS
THAT LIMIT CHOICES AND OPPORTUNITIES

From the perspective of Sen (2000), poverty should be seen as deprivation of basic capabilities, rather than merely as a low level of income. The perspective of poverty as capability deprivation does not involve any denial of the idea that low income is clearly one of the main causes of poverty, since lack of income can be a primary reason for a person's capability deprivation.

However, the expansion of freedoms also depends on other determinants, such as social and economic provisions (e.g., education, health, housing, nutrition and food security, community participation, etc.) and civil rights. Thus, Amartya Sen proposed a way of measuring human development, through a matrix of vectors of capabilities, multiple dimensions, to measure the evolution of the real freedoms of individuals.

ACAPABILITY APPROACH: A COMPREHENSIVE DEVELOPMENT PARADIGM

Human well-being is not limited to economic factors only

Amartya Sen's capability approach offers a comprehensive perspective on development. Based on it everything revolves around improving people's well-being, i.e., development must focus on people.

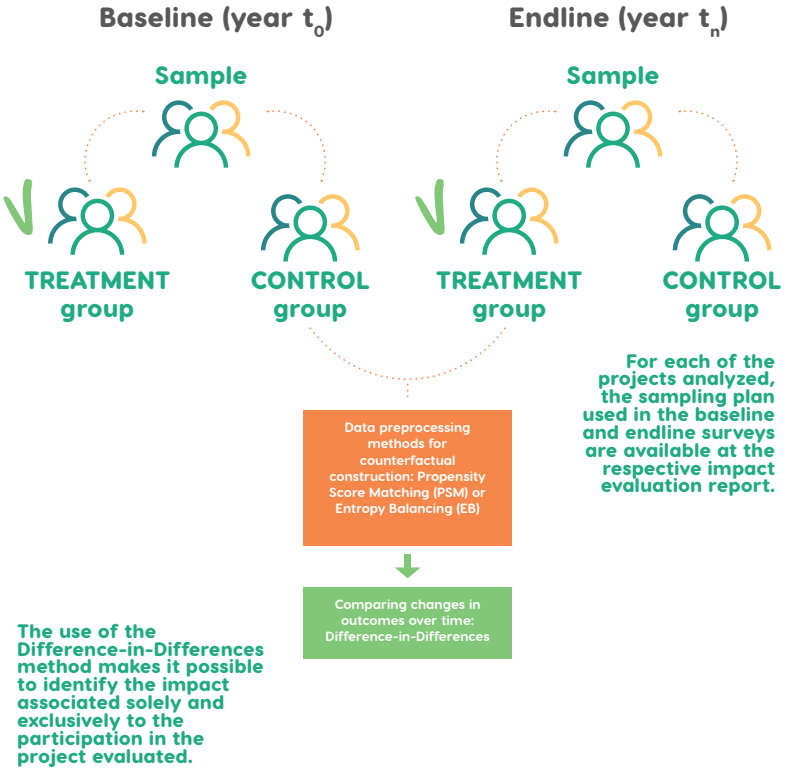
Based on Sen's contributions in the area of multidimensional poverty, relevant possibilities for operationalizing the Multidimensional Poverty Index emerged. The measurement of poverty must include different types of deprivation. In view of this, in addition to income, other dimensions are defined to measure the well-being conditions of households benefiting from IFAD-supported projects, such as human capital, social capital, nutrition and food security, housing, and sustainability.

3

MATERIAL AND METHODS

3.1 IMPACT EVALUATION METHOD

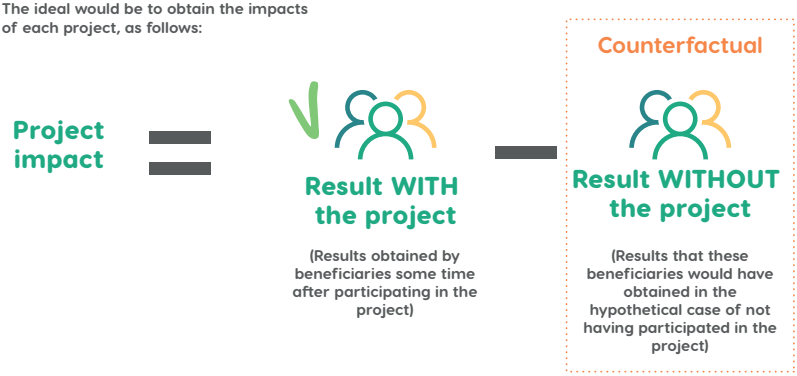
The data used in the impact evaluations comprise two moments in time: before and after the interventions carried out under each of the projects analyzed.



The use of these methods aimed at comparing the changes observed for beneficiaries (treatment group) and non-beneficiaries (control group) in outcome variables over time.Information regarding the years in which the baseline survey and the impact evaluation of each IFAD project in Brazil are presented in the Annex.

Data preprocessing methods for counterfactual construction

The ideal would be to obtain the impacts of each project, as follows:



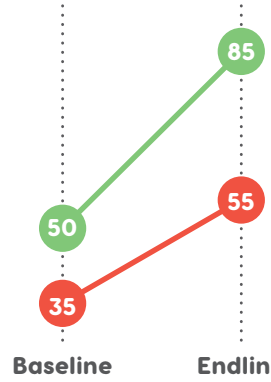
Because the counterfactual cannot be observed, the solution is to "replicate" or construct it. In this sense, the counterfactual can be constructed by using a group that is not affected by the intervention (the so-called control or comparison group). The idea is to select a group of individuals that equals the treatment group except for the exposure to the intervention investigated.

The existing methods for data preprocessing differ in terms of how counterfactuals are estimated. For the purpose of this material, some projects applied EB and others used PSM. These methods for data preprocessing are used to obtain statistically comparable groups for the estimation of projects' impacts through the Difference-in-Differences method.

In order to approximate the counterfactual, one must include a valid control group: individuals with the same characteristics as projects' beneficiaries, which differ only in terms of project participation.

Difference-in-Differences

After preprocessing the data and obtaining statistically comparable groups, the impacts of the projects were obtained by using the Difference-in-Differences method. This method compares the evolution of the outcomes of the treated and controls. Its operationalization and the interpretation of its results can be understood with the following example:



	Before	After	Diff.
Treatment	50	85	35
Control	35	55	20
Difference	15	30	15

In this case, both groups showed a positive evolution in the outcome variable, but since the growth of the treatment group (green) was higher than that of the control group (red), the impact would be positive.

In this specific example, the estimated impact would be equal to 15 units (35 – 20).

In sum, if the evolution is greater (smaller) for the treatment group than for the control group, the estimated impact will be positive (negative).

3.2 INDICATORS ANALYZED

To capture the different dimensions of well-being, nine indicators were used as outcome variables.

i. **Indicator of participation of women and the youth in community actions;**
ii. **Indicator of associativity;**
iii. **Housing indicator;**
iv. **Indicator of access to public policies;**
v. **Indicator of access to agricultural policies;**
vi. **Drought indicator;**
vii. **Poverty indicator;**
viii. **Indicator of agroecological and sustainable practices; and**
ix. **Food safety indicator.**

The impact on agricultural and livestock activities was also evaluated, considering the quantity produced and the value of sales, as well as the value of household self-consumption.

The results of the impact evaluation are presented following a traffic light system

The **red light** shows that the coefficient estimated is less than zero and statistically significant, i.e., the impact is negative.

The **yellow light** shows that the estimated coefficient is statistically equal to zero, i.e., there is no impact

The **green light** shows that the estimated coefficient is greater than zero and statistically significant, i.e., the impact is positive

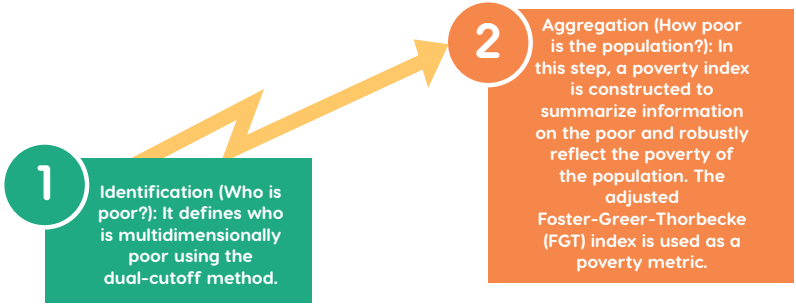
3.3 ALKIRE AND FOSTER'S MULTIDIMENSIONAL POVERTY INDEX

A "true" measure of poverty should not rely only on an income indicator, but also on other indicators.

The poverty of a given population is a manifestation of insufficient well-being and depends on monetary and non-monetary variables. Therefore, the use of income as the sole indicator of well-being is inadequate and must be complemented by other attributes like housing, literacy, life expectancy, provision of public goods, etc. (Bourguignon and Chakravarty, 2003).

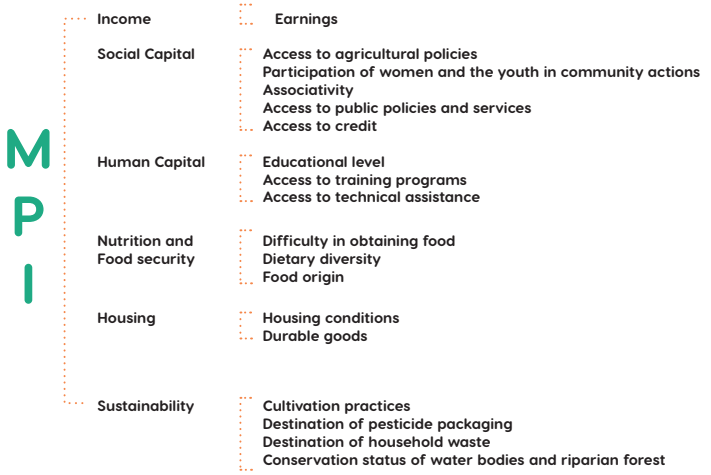
Multidimensional poverty is an alternative to the income approach. In identifying the poor, one may check whether individuals have access to a set of minimum basic needs. Each person is characterized by a vector of characteristics that encapsulate human deprivation, not just by income (Tsui, 2000).

As with the one-dimensional approach (income), measuring multidimensional poverty involves two main steps (Alkire and Foster, 2011):



Fahel, Teles and Caminhas (2016) draw attention to the flexibility and ability of the Multidimensional Poverty Index (MPI) to adapt to different contexts. MPI also make it possible to perform comparative analyses, in which the index can be disaggregated into different regions and/or broken down according to the contribution of each underlying indicator, enabling the identification of the incidence and intensity of poverty.

In this sense, the global MPI measures the poverty phenomenon. Due to the lack of consensus or satisfactory theoretical justification for applying a particular weight structure, the same weight was assigned to the six dimensions considered here, with the indicators of each dimension being equally weighted as well.



Note: The description of the indicators and their respective variables, as well as the cutoff specification, can be found on the Impact Evaluation Report – Productive Development and Capacity-Building Project in the State of Ceará – Paulo Freire Project (PPF).

Still regarding the Multidimensional Poverty Analysis, it is worth noting that the first cutoff is set specifically for each dimension, as follows:

These values were chosen based on the statistical analysis of indicators, as well as on the decision criterion of Alkire and Foster (2011), which predicts that the cutoff should be the point where there is a large discontinuity in the number of dimensionally poor households. Regarding the dual cutoff - i.e., the point that defines in how many dimensions the household must be simultaneously deprived to be considered poor - it is important to analyze different MPI values, for different cutoffs (k)*. The cutoff is set to the point where there is a large drop in the MPI.

The dual cutoff chosen was k=2, except for PDHC (for which the dual cutoff chosen was k=3), as can be seen in Tables 2, 5, 9, 13, 17, and 21. Thus, this will be the MPI result to be considered throughout the text. The different results for k are presented only for illustrative purposes, demonstrating why the given cutoff was chosen.

*Note: The individual (or household) will be poor if the deprivation count (ci) is greater than the cutoff (k), i.e., if ci > k.

4

OUTCOMES AND IMPACTS

OF IFAD PROJECTS IN BRAZIL

In this section, we detail the results of the outcome and impact evaluations of each of the projects analyzed. For each project, the results found by the impact evaluation are placed first. Subsequently, the results of the Multidimensional Poverty Analysis conducted for PROCASE, PVSA, PPF, PDHC, PDT and PSA are presented. Specifically, we display the following: the MPI for the whole sample of each project and by planning regions (territories); the breakdown of MPI to verify the contribution of each dimension to the index; and the MPI per group to enable the comparison between the treated and controls.

4.1 PROCASE

4.1.1 Synthesis of the results obtained by the impact evaluation

Indicator	Impact
Socioeconomic factors	
Participation of women and the youth in Community actions	▼
Associativity	▼
Housing	▼
Access to public policies	▲
Access to agricultural policies	▲
Drought	▲
Monthly per capita income	▲
Adoption of agroecological and sustainable practices	▼
Nutrition and food security	▲
Agriculture and livestock (value of sales)	
Animal production	▼
Products of animal origin	▲
Plant production	▲
Products of plant origin	▼
Self-consumption	▲

Notes: Triangle facing up indicates positive estimate. Triangle facing down indicates negative estimate. Yellow triangle refers to statistically non-significant estimate or null impact. Green triangle (facing up) indicates positive impact. Red triangle (down) indicates negative impact.
Source: Research results.

4.1.2 Multidimensional poverty in municipalities from the regions of Cariri, Seridó and Curimataú, Paraíba State, assisted by PROCASE

For the sample of Paraíba state municipalities, it was identified a drop in multidimensional poverty rates (MPI) between 2015 and 2019.

TABLE 1: MULTIDIMENSIONAL POVERTY INDEX FOR THE WHOLE PROCASE SAMPLE, 2015 AND 2019, K FROM 1 TO 3

	MPI	
K	**2015**	**2019**
k=1	55%	45%
k=2	**54%**	**43%**
k=3	48%	33%

Source: Elaborated by the authors based on research results

For the dual cutoff chosen (k=2), **multidimensional poverty dropped from 54% to 43%.**

MPI was broken down into three* planning regions of the state of Paraíba. The results of such analysis facilitate the understanding of the incidence of poverty in different population groups.

TABLE 2: MULTIDIMENSIONAL POVERTY INDEX FOR THE WHOLE PROCASE SAMPLE, BY PLANNING REGION, 2015 AND 2019, K=2

	MPI	
Region	**2015**	**2019**
1	54%	40%
2	53%	43%
3	58%	45%

Source: Elaborated by the authors based on research results.
Note: The State of Paraíba is divided in three regions, as follows: Region 1 – Seridó, Curimataú, Piemonte da Borborema and Zona da Mata Norte; Region 2 – Borborema, Vale do Paraíba, Cariri Ocidental, Cariri Oriental and Zona da Mata Sul; and Region 3 – Médio Sertão, Vale do Piranhas, Vale do Piancó, Alto Sertão and Vale do Teixeira.

MPI rates are lower in 2019 than in 2015 for all regions. Besides presenting the most significant drop (-14 p.p.), Region 1 was also the one with the lowest multidimensional poverty rate in 2019 (40%).

By breaking down the MPI, it was able to capture the contribution of each dimension to the overall index. Table 3 shows the relative contribution of each dimension for 2015 and 2019.

TABLE 3: RELATIVE CONTRIBUTION OF EACH DIMENSION FOR THE MULTIDIMENSIONAL POVERTY INDEX, WHOLE PROCASE SAMPLE, 2015 AND 2019, K=2

	MPI	
Dimension	**2015**	**2019**
Income	22.92%	21.41%
Social Capital	6.29%	10.61%
Human Capital	18.16%	26.71%
Nutrition and food security	10.54%	7.91%
Housing	17.21%	6.10%
Sustainability	24.89%	27.87%

Source: Elaborated by the authors based on research results.

The relative participation of the Income, Nutrition and food security, and Housing dimensions decreased during the period analyzed. This result possibly indicates an improvement in quality of life of investigated households as they reflect the loss of relevance of such dimensions in 2019, after PROCASE interventions. On the contrary, the relative participation of the Social Capital, Human Capital, and Sustainability dimensions increased from 2015 to 2019. This result denotes a worsening in such dimensions, which should receive greater attention in future interventions.

Sustainability, Human Capital, and Income, in that order, were the dimensions that contributed the most to MPI in 2019. Therefore, the political action must prioritize such dimensions, promoting their strengthening and thus reducing poverty incidence. Greater investment in the best cultivation and environmental practices, in quality education and in income generation, for example, can lead to good future results that promote the sustainable development.

Lastly, Table 4 shows MPI results for the treatment and control groups in 2015 and 2019. For the treated, poverty incidence dropped from 46% to 28%. For controls, in turn, MPI dropped from 60% to 53%.

TABLE 4: MULTIDIMENSIONAL POVERTY INDEX FOR TREATMENT AND CONTROL GROUPS, 2015 AND 2019, K=2

	MPI	
Group	**2015**	**2019**
Treatment	**46%**	28%
Control	**60%**	53%

Source: Elaborated by the authors based on research results

The **drop was more relevant for the treatment group,** indicating that the interventions conducted under **PROCASE has been effective in reducing multidimensional poverty.**

Thus, we emphasize that more and more comparative studies should be carried out. Besides incorporating new available indicators and extending the temporal analysis, such studies must also try to capture the changes that occur in certain groups of the population over time.

4.2 PVSA

4.2.1 Synthesis of the results obtained by the impact evaluation

Indicator	Impact
Socioeconomic factors	
Participation of women and the youth in Community actions	▲
Associativity	▲
Housing	▼
Access to public policies	▲
Access to agricultural policies	▲
Drought	▲
Monthly per capita income	▲
Adoption of agroecological and sustainable practices	▼
Nutrition and food security	▼
Agriculture and livestock (value of sales)	
Animal production	▲
Products of animal origin	▼
Plant production	▲
Products of plant origin	▲
Self-consumption	▲

Source: Research results.
Notes: Triangle facing up indicates positive estimate. Triangle facing down indicates negative estimate. Yellow triangle refers to statistically non-significant estimate or null impact. Green triangle (facing up) indicates positive impact. Red triangle (down) indicates negative impact.

4.2.2 Multidimensional poverty in municipalities from the State of Piauí assisted by PVSA

The results shown in Table 5 indicates that, regardless of the cutoff considered, the MPI is lower in 2020 than in 2015. In fact, when considering the cutoff defined a priori, in which the household is considered poor when it is deprived in at least 1/3 of the analyzed dimensions, the MPI decreased **from 41% to 36%.**

TABLE 5: MULTIDIMENSIONAL POVERTY INDEX FOR THE WHOLE PVSA SAMPLE, 2015 AND 2020, K FROM 1 TO 3

	MPI	
k	**2015**	**2020**
1	43%	39%
2	**41%**	**36%**
3	29%	22%

Source: Elaborated by the authors based on research results.

Table 6 depicts the MPI calculated for each of the five planning territories of Piauí state that had at least one municipality in the sample considered here. Except for the region of Vale do Sambito, all territories registered a decrease in MPI between 2015 and 2020, with emphasis on the region of Vale do Guaribas, whose poverty incidence dropped 8 p.p. during the analyzed period.

TABLE 6: MULTIDIMENSIONAL POVERTY INDEX FOR THE WHOLE PVSA SAMPLE, BY PLANNING REGION, 2015 AND 2020, K=2

	MPI	
Region	**2015**	**2020**
Chapada Vale do Rio Itaim	45%	38%
Serra da Capivara	42%	40%
Vale do Canindé	35%	30%
Vale do Guaribas	42%	34%
Vale do Smabito	37%	47%

Source: Elaborated by the authors based on research data.

Still considering the PVSA sample as a whole, Table 7 shows the contribution of each dimension considered for the construction of the MPI. Regardless of the year considered, Human Capital and Income are the dimensions with the largest weight in the calculation of the MPI. Actions focused on these dimensions, such as greater investment in education and job generation, could facilitate poverty reduction in the study region.

TABLE 7: RELATIVE CONTRIBUTION OF EACH DIMENSION FOR THE MULTIDIMENSIONAL POVERTY INDEX, WHOLE PVSA SAMPLE, 2015 AND 2020, K=2

	MPI	
Dimension	**2015**	**2020**
Income	26.99%	25.06%
Social Capital	14.00%	16.74%
Human Capital	33.74%	35.54%
Nutrition and food security	10.88%	13.10%
Housing	12.19%	7.40%
Sustainability	2.22%	2.16%

Source: Elaborated by the authors based on research results.

Finally, Table 8 presents the MPI values calculated for the treatment and control groups, considering the years of 2015 and 2020.

TABLE 8: MULTIDIMENSIONAL POVERTY INDEX FOR TREATMENT AND CONTROL GROUPS, 2015 AND 2020, K=2

Group	MPI	
	2015	2020
Treatment	39%	29%
Control	**42%**	**43%**

Source: Elaborated by the authors based on research results.

For the control group, the MPI showed a slight increase in the period analyzed. For the treatment group, on the contrary, there was a significant drop in the index, evidencing that **multidimensional poverty clearly decreased during PVSA operating years.**

4.3 PROJETO PAULO FREIRE

4.3.1 Synthesis of the results obtained by the impact evaluation

Indicator	Impact
Socioeconomic factors	
Participation of women and the youth in Community actions	▲
Associativity	▼
Housing	▲
Access to public policies	▲
Access to agricultural policies	▲
Drought	▲
Monthly per capita income	▼
Adoption of agroecological and sustainable practices	▲
Nutrition and food security	▲
Agriculture and livestock	
Poultry (quantity)	▲
Poultry (value of sales)	▲
Eggs (quantity)	▲
Eggs (value of sales)	▲
Sheep (quantity)	▼
Sheep (value of sales)	▼
Goats (quantity)	▲
Goats (value of sales)	▲
Swine (quantity)	▲
Swine (value of sales)	▲
Honey (quantity)	▼
Fruits (production value)	▲
Vegetables (production value)	▲

Source: Research results.
Notes: Triangle facing up indicates positive estimate. Triangle facing down indicates negative estimate. Yellow triangle refers to statistically non-significant estimate or null impact. Green triangle (facing up) indicates positive impact. Red triangle (down) indicates negative impact.

4.3.2 Multidimensional poverty in municipalities from the State of Ceará assisted by PPF

MPI results for the sample of Ceará municipalities show that, for all cutoffs considered, multidimensional poverty rates are lower in 2020 than in 2015.

TABLE 9: MULTIDIMENSIONAL POVERTY INDEX FOR THE WHOLE PPF SAMPLE, 2015 AND 2020, K FROM 1 TO 3

	MPI	
k	**2015**	**2020**
k=1	47%	41%
k=2	**45%**	**37%**
k=3	36%	27%

Source: Elaborated by the authors based on research results.

There **was a decrease in poverty incidence during the period analyzed, from 45% to 37%**.

MPI can contribute to the planning of policies aimed at combating poverty, as it can be decomposed to reveal the incidence of poverty in different population groups.

TABLE 10: MULTIDIMENSIONAL POVERTY INDEX FOR THE WHOLE PPF SAMPLE, BY PLANNING REGION, 2015 AND 2020, K=2

	MPI	
Region	**2015**	**2020**
Litoral Oeste/Vale do Curu	50%	46%
Serra da Ibiapaba	61%	44%
Sertão de Sobral	44%	37%
Sertão dos Crateús	44%	35%
Sertão dos Inhamuns	40%	27%
Cariri	47%	44%

Source: Elaborated by the authors based on research results.

By decomposing by planning region, it is observed that **multidimensional poverty rates are lower in 2020 than in 2015 for all planning regions.**

Complementing the previous analyses, MPI results were broken down by dimensions to observe the contribution of each one to the index. Table 11 shows the relative contribution of each dimension for the years considered. First, it was perceived that four dimensions – Income, Nutrition and food security, Housing, and Sustainability – had their participation in the MPI decreased from 2015 to 2020.

TABLE 11: RELATIVE CONTRIBUTION OF EACH DIMENSION FOR THE MULTIDIMENSIONAL POVERTY INDEX, WHOLE PPF SAMPLE, 2015 AND 2020, K=2

Dimensions	MPI	
	2015	2020
Income	25.17%	23.65%
Social Capital	9.50%	19.15%
Human Capital	26.38%	28.96%
Nutrition and food security	16.13%	13.22%
Housing	13.04%	9.89%
Sustainability	9.80%	5.13%

This result indicates that these dimensions have lost relevance in multidimensional poverty, which may be a good indication of improvements in living conditions as a result of the intervention of the Paulo Freire Project. On the other hand, the decomposition by dimensions shows that the Social Capital and Human Capital dimensions are the ones that had an increase in their contribution to poverty, which may be indicative of a worsening in the conditions of these dimensions.

Still according to Table 11, deprivations in Income, Social Capital and Human Capital are the ones that contribute the most to the MPI in 2020. These results illustrate how the decomposition of the index by dimension/indicators can help to identify priorities and direct the actions aimed at poverty reduction as the most urgent needs of the population are identified.

Therefore, public policy interventions should be aimed at ensuring improvements in these dimensions, which could lead to a lower poverty level. Greater investment in quality education, for example, may have an impact on the reduction of poverty incidence, which will bring good future results, since greater schooling leads to better opportunities for income generation, possibly improving human capital and, consequently, social capital.

Table 12 shows that the poverty rate dropped both for the treatment and control groups from 2015 to 2020. However, this drop was much more expressive for the treated, going from 44% to 34%. This is a good result and may indicate that PPF actions conducted in the State of Ceará have been positive in reducing Multidimensional Poverty.

TABLE 12: MULTIDIMENSIONAL POVERTY INDEX FOR TREATMENT AND CONTROL GROUPS, 2015 AND 2020, K=2

Group	MPI	
	2015	2020
Treatment	44%	34%
Control	**45%**	**42%**

Source: Elaborated by the authors based on research results.

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4.4 PDT

4.3.1 Synthesis of the results obtained by the impact evaluation

Indicator	Impact
Socioeconomic factors	
Participation of women and the youth in Community actions	▲
Associativity	▲
Housing	▲
Access to public policies	▲
Access to agricultural policies	▲
Drought	▲
Monthly per capita income	▼
Adoption of agroecological and sustainable practices	▼
Nutrition and food security	▼
Agriculture and livestock (value of sales)	
Animal production	▼
Products of animal origin	▲
Plant production	▼
Products of plant origin	▼
Self-consumption	▼

Source: Research results.
Notes: Triangle facing up indicates positive estimate. Triangle facing down indicates negative estimate. Yellow triangle refers to statistically non-significant estimate or null impact. Green triangle (facing up) indicates positive impact. Red triangle (down) indicates negative impact.

4.2.3. Multidimensional poverty in municipalities from the State of Sergipe assisted by PDT

From the analysis of MPI results for the municipalities of the State of Sergipe represented in the sample used here, it was verified a decrease in the poverty rate during the analyzed period regardless of the value of *k*.

TABLE 13: MULTIDIMENSIONAL POVERTY INDEX FOR THE WHOLE PDT SAMPLE, 2015 AND 2019, K FROM 1 TO 3

k	MPI	
	2015	2019
1	52%	49%
2	**51%**	**47%**
3	44%	39%

Source: Elaborated by the authors based on researchresults.

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Multidimensional poverty rates were lower for 2019 compared to 2015. For the chosen cutoff (k=2), the index dropped from 51% to 47%.

The segregation of MPI by planning region (Table 14) reveals that poverty incidence in population groups tends to be lower in 2020 than in 2015. The exception were the regions of Agreste and Sertão. The region that showed the greatest drop from one period to the other was Centro Sul, with a drop of 15 p.p. In 2019, the Médio Sertão region had the highest rate of multidimensional poverty (55%), while the region of Centro Sul had the lowest rate (31%).

TABLE 14: MULTIDIMENSIONAL POVERTY INDEX FOR THE WHOLE PDT SAMPLE, BY PLANNING REGION, 2015 AND 2019, K=2

Region	MPI	
	2015	2019
Médio Sertão	57%	55%
Baixo São Francisco	49%	41%
Agreste	51%	53%
Sertão	54%	54%
Centro Sul	46%	31%

Source: Elaborated by the authors based on research results.

Through Table 15, it can be seen that most of the dimensions decreased their contribution to the MPI from 2015 to 2019. The sole exception was Social Capital. The remaining dimensions lost relevance in the MPI, which can be a good indication of improvements in living conditions and good agroecological practices, due to PDT interventions. On the other hand, the Social Capital dimension showed an increase in its relative contribution to multidimensional poverty, which may be indicative of worsening conditions in this dimension, thus deserving greater attention from policymakers.

TABLE 15: RELATIVE CONTRIBUTION OF EACH DIMENSION FOR THE MULTIDIMENSIONAL POVERTY INDEX, WHOLE PDT SAMPLE, 2015 AND 2019, K=2

	MPI	
Dimension	**2015**	**2019**
Income	21.49%	20.33%
Social Capital	6.20%	16.58%
Human Capital	26.68%	23.55%
Nutrition and food security	13.25%	11.97%
Housing	10.22%	7.76%
Sustainability	22.18%	19.80%

Source: Elaborated by the authors based on research results..

Deprivations in Income, Human Capital and Sustainability are the ones with the greatest weight in the Multidimensional Poverty Index in 2019. This result is important to identify the most urgent needs of the population and direct actions to reduce poverty. Thus, the results suggest that public policy interventions should be directed to ensure improvements in these dimensions.

Last but not least, Table 16 presents the Multidimensional Poverty Index for both the treatment and control groups in 2015 and 2019. It is observed that the poverty rate dropped between the treated, from 46% to 37%, and increased for controls, from 56% to 57%.

TABLE 16: MULTIDIMENSIONAL POVERTY INDEX FOR TREATMENT AND CONTROL GROUPS, 2015 AND 2019, K=2

Group	MPI	
	2015	2019
Treatment	46%	37%
Control	**56%**	**57%**

Source: Elaborated by the authors based on research results.

PDT actions have been positive on the reduction of Multidimensional Poverty, showing **a very expressive drop (9 p.p.) in the treatment group.**

4.5 PSA

4.5.1 Synthesis of the results obtained by the impact evaluation

Indicator	Impact
Socioeconomic factors	
Participation of women and the youth in Community actions	▲
Associativity	▲
Housing	▲
Access to public policies	▲
Access to agricultural policies	▲
Drought	▼
Monthly per capita income	▲
Adoption of agroecological and sustainable practices	▲
Nutrition and food security	▲
Agriculture and livestock (value of sales)	
Animal production	▼
Products of animal origin	▼
Plant production	▲
Products of plant origin	▼
Self-consumption	▲

Source: Research results.

Notes: Triangle facing up indicates positive estimate. Triangle facing down indicates negative estimate. Yellow triangle refers to statistically non-significant estimate or null impact. Green triangle (facing up) indicates positive impact. Red triangle (down) indicates negative impact.

4.5.2. Multidimensional poverty in municipalities from the State of Bahia assisted by PSA

From the analysis of the results of the MPI for the municipalities of the State of Bahia, which were represented in the sample used in this research, it could be seen that the incidence of poverty is lower in 2022, for all values of k.

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TABLE 17: MULTIDIMENSIONAL POVERTY INDEX FOR THE WHOLE PSA SAMPLE, 2016 AND 2021, K FROM 1 TO 3

k	MPI	
	2016	2021
1	59%	48%
2	**58%**	**46%**
3	53%	37%

Source: Elaborated by the authors based on research results.

Multidimensional poverty rates were lower for 2021 compared to 2016. For the chosen cutoff (k=2), the index dropped from 58% to 46%.

By analyzing the MPI by planning region (Table 18), it can be observed that multidimensional poverty rates dropped in the investigated period, in all regions. The biggest fall was observed in Piemonte da Diamantina. The region of Sertão do São Francisco had the highest MPI. The regions of Piemonte da Diamantina, and Sisal e Bacia do Jacuípe had the lowest rates.

TABLE 18: MULTIDIMENSIONAL POVERTY INDEX FOR THE WHOLE PSA SAMPLE, BY PLANNING REGION, 2016 AND 2021, K=2

	MPI	
Region	**2015**	**2021**
Piemonte Norte do Itapicuru	57%	43%
Piemonte da Diamantina	53%	38%
Sertão do São Francisco	64%	52%
Sisal e Bacia do Jacuípe	49%	35%

Source: Elaborated by the authors based on research results.

Table 19 shows the MPI broken down by dimensions in the two years surveyed. First, it can be seen that only two dimensions - Income and Human Capital - have lost relevance in multidimensional poverty. This is a good result, but it can not be an indication of improvements in living conditions as important dimensions - e.g., Housing and Nutrition and food security - that affect population well-being did not show a drop in their participation in the MPI. On the contrary, along with Social Capital and Sustainability, these dimensions started to have a greater contribution to the poverty rate in 2021.

TABLE 19: RELATIVE CONTRIBUTION OF EACH DIMENSION FOR THE MULTIDIMENSIONAL POVERTY INDEX, WHOLE PSA SAMPLE, 2016 AND 2021, K=2

	MPI	
Dimension	**2016**	**2021**
Income	17.47%	15.83%
Social Capital	12.35%	20.90%
Human Capital	23.36%	6.51%
Nutrition and food security	10.27%	10.83%
Housing	13.39%	18.92%
Sustainability	23.15%	27.01%

Source: Elaborated by the authors based on research results.

In 2021, it is clear that deprivations in Sustainability and Social Capital are the ones that contribute the most to the MPI. These results help to identify priorities and direct poverty reduction actions. Public policy interventions aimed at these dimensions could lead to a lower level of poverty incidence.

Lastly, we analyze the behavior of IPM, from 2016 to 2021, for the two groups analyzed, treatment and control. It is noted that poverty rates fell in both groups during the period investigated, with this fall being a little more expressive for controls.

TABLE 20: MULTIDIMENSIONAL POVERTY INDEX FOR TREATMENT AND CONTROL GROUPS, 2016 AND 2021, K=2

Group	MPI	
	2016	2021
Treatment	55%	43%
Control	**62%**	**47%**

Source: Elaborated by the authors based on research results.

PSA actions have been positive on the reduction of Multidimensional Poverty in the benefiting regions of the State of Bahia, considering that in the endline year, the poverty rate remained lower for the treated

4.6 PDHC

Before starting the analysis of MPI results for the sample of municipalities benefited by the PDHC in different states, it is important to make some considerations about the dual cutoff. Unlike the other projects considered in this report, for which we used k=2, in the PDHC the dual cutoff was defined as k=3. Following Alkire and Foster (2011), when observing the MPI for different values of k, the decision on the choice of k will be made where there is a large drop in relation to the MPI. From Table 21, it can be seen that there is great discontinuity in the IPM when k changes from 3 to 4. Considering k=3, the household must simultaneously suffer deprivation in 3 dimensions to be considered poor.

By analyzing Table 21, it is perceived a reduction in the incidence of Multidimensional Poverty for all values of k from 2017 to 2021. Considering the cutoff chosen for this analysis (k=3), the MPI dropped from 69% to 52%. These numbers call attention not only because of the high value of Multidimensional Poverty in the States analyzed, but also because of the expressive drop (17 p.p.) registered from 2017 to 2021.

TABLE 21: MULTIDIMENSIONAL POVERTY INDEX FOR THE WHOLE PDHC SAMPLE, 2017 AND 2021, K FROM 1 TO 4

K	**MPI**	
	2017	**2021**
1	71%	58%
2	71%	58%
3	***69%***	***52%***
4	60%	37%

Source: Elaborated by the authors based on research results.

Table 22 shows MPI results broken down by dimensions for the two years surveyed. Income and Housing dimensions were the only ones that lost relevance in the Multidimensional Poverty Index, which is a good indication of improvements in living conditions, since family income has improved considerably in the period, as well as the structure of households and the possession of durable goods by families. However, other important dimensions, which affect the well-being of families, did not show a drop in their participation in the MPI. On the contrary, they increased their relevance in poverty, such as Nutrition and food security. The other dimensions also started to have a greater contribution to the poverty rate in 2021.

Deprivations in Human Capital and Sustainability significantly affect the MPI, being the most relevant for the composition of the index. Therefore, public policy interventions should be directed to these dimensions, which could lead to a lower level of poverty.

TABLE 22: RELATIVE CONTRIBUTION OF EACH DIMENSION FOR THE MULTIDIMENSIONAL POVERTY INDEX, WHOLE PDHC SAMPLE, 2017 AND 2021, K=3

	2015	2021
Dimension	**M0**	**M0**
Income	17.47%	15.83%
Social Capital	12.35%	20.90%
Human Capital	23.36%	6.51%
Nutrition and food security	10.27%	10.83%
Housing	13.39%	18.92%
Sustainability	23.15%	27.01%

Source: Elaborated by the authors based on research results.

Finally, it is important to compare the behavior of the IPM for the two groups surveyed: treatment and control (Table 23). From one period to another, it is observed that poverty rates dropped in both groups, and this drop was very expressive for the treated, by 22 p.p., versus 14 p.p. for controls. In 2021, the poverty rate became much lower for the treatment group, which is a very different result from 2017 as the MPI was practically equal for both groups. These results allow us to conclude that PDHC actions have been effective in reducing Multidimensional Poverty in the states covered by the Project.

TABLE 23: MULTIDIMENSIONAL POVERTY INDEX FOR TREATMENT AND CONTROL GROUPS, 2017 AND 2021, K=3

Group	**MPI**	
	2017	**2021**
Treatment	69%	47%
Control	70%	56%

Source: Elaborated by the authors based on research results.

5

FINAL REMARKS

This report sought to present evaluations of the outcomes and impacts of IFAD projects in Brazil. It is important to emphasize that the data and information presented here show that the projects have different intervention strategies, which are adapted to the social and physical conditions and to the local institutional environment. Therefore, comparisons should not be made between projects in terms of their impacts and achieved outcomes.

Considering that poverty is a phenomenon capable of impacting households in different ways, this report presents an innovation by calculating the Multidimensional Poverty Index for the sample of households analyzed in each project. Thus, the measurement of poverty includes different types of deprivation other than the lack of income. In this sense, social capital, human capital, nutrition and food security, housing and sustainability dimensions were incorporated. In addition, an analysis of the impact of each project on socioeconomic and productive indicators was carried out.

Overall, the results presented reinforce IFAD's commitment to promoting sustainable, inclusive rural development and to the country's poverty reduction agenda, especially in the poorest regions and the most vulnerable groups. However, it is still a great challenge to reach the different dimensions of poverty and to totally eliminate the restrictions faced by the beneficiaries of projects in the Brazilian poorest region that prevent them from entering the production process. Part of the expected impacts demand a time of maturation of the actions implemented by the projects that extrapolate the analyzed period.

Additionally, in the midst of the evolution of IFAD projects, an atypical scenario surged: the COVID 19 pandemic arose in 2020 and adverse climatic events (e.g., drought) hit the Northeast region of Brazil. Thus, it is worth emphasizing that these adverse shocks may have contributed to the modest or non-existent impacts on some indicators.

However, the impacts of the projects transcend the idea of an increase, solely and exclusively in income, as they reach issues such as: sustainability, food security, improvement of the social and human capital of the beneficiaries. In addition, the evaluation time is relatively short to measure the effect on income, given that it is intuitive that projects generate effects primarily on components related to social and human capital, food security, and sustainability, among others. That is, there is an intuitive order of chaining of effects in which the positive ones on base factors are initially achieved and then a positive effect on income is achieved.

In this sense, it is suggested that the impact evaluation and monitoring take place again considering a longer period so that, in fact, the positive effects on the income of the beneficiaries of each project can actually be observed. It is also suggested to improve the sustainability and exit strategy of the projects together with the beneficiaries, working ways to smooth the end of the actions, ensuring the sustainability of impact initiatives, and guaranteeing the constancy and chain of positive results in the long term.

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