Backlash of policy dismantling in the production of invisibility: when pesticides cease to be a public problem

Repercussão do desmantelamento de políticas na produção de invisibilidade: quando os agrotóxicos deixam de ser um problema público

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doi:10.18472/SustDeb.v14n1.2023.45495

Received: 21/10/2022
Accepted: 13/04/2023

ARTICLE-DOSSIER

ABSTRACT

Brazil is one of the world's largest consumers of pesticides, but their impacts on the population are still rarely recognised as a public problem. During the governments of Lula and Dilma, several social participation spaces were created to discuss this issue. In this article, we discuss how dismantling these spaces has contributed to producing invisibility regarding the impacts of pesticides. We were confronted with this issue when building a citizen observatory in the metropolitan region of Santarém, Pará, in partnership with family farmer unions. Based on interviews, participant observation, and focus groups, we analyse how the dismantling of pesticide regulation has occurred nationally and how it influenced the territorial level. Despite research showing the impacts of pesticides, the progressive dismantling of social participation spaces, such as the Regional Forum to Combat the Impacts of Pesticides in Santarém, has led to the invisibility of the impacts caused by their use.

Keywords: Family Agriculture. Social Participation. Brazil. Amazon. Citizen Observatory.

RESUMO

O Brasil é um dos maiores consumidores mundiais de agrotóxicos, mas seus impactos sobre a população ainda são pouco reconhecidos como um problema público. Durante os governos trabalhistas (2003-2016), vários espaços de participação social foram criados para debater esse tema. Neste artigo, discutimos como o desmantelamento desses espaços vem contribuindo para uma produção de invisibilidade dos impactos dos agrotóxicos. Fomos confrontados com essa questão ao construir um observatório cidadão na região metropolitana de Santarém, Pará, em parceria com sindicatos de agricultores familiares. A partir de entrevistas, observação participante e grupos de reflexão, analisamos como o desmantelamento da regulação de agrotóxicos aconteceu em nível nacional e como repercutiu em âmbito territorial. Mostramos que, apesar de pesquisas evidenciarem os impactos dos agrotóxicos, a desarticulação progressiva dos espaços de participação social, como a do Fórum Regional de Combate aos Impactos de Agrotóxicos em Santarém, leva à invisibilização dos impactos causados por seu uso.

Palavras-chave: Agricultura Familiar. Participação social. Brasil. Amazônia. Observatório cidadão.

1 INTRODUCTION

While at the international level the health risks of pesticides for farmers and rural populations are increasingly highlighted in the scientific literature (FLEMING *et al*., 2003; SARKAR *et al*., 2021), leading decision-makers to consider the withdrawal from the market of molecules widely used in agriculture such as glyphosate (MAHÉ *et al*., 2020), these warnings are obscured in conservative policy contexts.

In Brazil, pesticide spraying levels are among the highest in the world, with approximately 6 litres per hectare compared to 2 litres per hectare in Europe, reaching 19 litres per hectare for soy in the Amazon (PIGNATI *et al*., 2017)[1]. In addition, current regulatory limits for environmental contamination and human exposure are much more permissive than in Europe[2], and little research has measured the health impact of this exposure on Brazilian rural and urban populations (PIGNATI *et al*., 2017; SCHWAMBORN, 2019). This is favoured mainly by a context strongly dominated by an agribusiness based on agrochemicals.

Although several spaces for social participation emerged during the governments of Lula and Dilma, these spaces have not been without tensions between actors advocating different models of agriculture. These tensions were exacerbated during the Bolsonaro government, as it promoted an ultraliberal development and dismantled all policies supporting family farming and the environment, with the unconditional support of agribusiness (NIEDERLE *et al*., 2019). In this article, we focus on the relationship between dismantling public policies, disrupting social participation spaces and the effect on the public debate about pesticides.

Bauer and Knill (2012, p. 35) define policy dismantling as "a change of direct, indirect, hidden, or symbolic nature that may decrease the number of policies in a particular area, reduce the number of instruments used, or reduce their intensity." Grisa and Niederle (2021) point out that new governments generally avoid extinguishing policies, as this strategy can generate great opposition and potentially high political costs. Instead, they prefer to opt for replacement, change in objectives, or ineffectiveness. When extinction is the chosen path, there is usually a prior process of delegitimisation.

Niederle *et al*. (2022) point out that dismantling affects not only the policy instruments - which are generally more analysed - but also the networks and social relations between state and non-state actors. However, the debate on dismantling (BAUER; KNILL, 2012) has paid little attention to the various strategies that can disrupt these relations or limit social participation and the consequences of such disruption.

Dedieu and Jouzel studied in France the effects of the institutional lack of coordination in the case of pesticides, showing how it contributed to maintaining a public "ignorance" (DEDIEU; JOUZEL, 2015), that is, of invisibility regarding the harmfulness of products within the public sphere. While invisibility can be defined as a simple absence of knowledge, studies increasingly consider it a social construction (DEDIEU; JOUZEL, 2015; SANTOS; ARAÚJO; BAUMGARTEN, 2016). Some studies even highlight conscious strategies, such as those of the tobacco industry's "doubt merchants" (ORESKES; CONWAY, 2010), who keep tobacco consumption controversies open to fuel doubt. Other works focus on the unintended dimension of invisibility production, inscribed in disciplinary and fragmented systems of knowledge production that prevent a problem from becoming visible (DEDIEU; JOUZEL, 2015).

Faced with this production of invisibility, social actors have developed various strategies to build evidence and set political agendas. Fillion and Torny (2015) report how victims of destilbene brought together their cases, creating a collective, and show how the three successive operations of claiming - "naming" the harm suffered, "blaming" those responsible, and "claiming" for a compensation - enabled the collectivisation and publicising of a problem. Gudowsky (2021) shows how establishing participatory research agendas can support policymaking by engaging contrasted opinions, improving the effectiveness of decisions in controversial situations, and ensuring engagement on issues of public interest. Thus, in the field of pesticides, several participatory initiatives have sought to empower farmers, such as farmer field schools (VAN DEN BERG; JIGGINS, 2007) or actor-schools (TONNEAU *et al*., 2021) to discuss the effects of pesticides and develop alternative practices to their use.

As part of the project named Observatory of the Dynamics of Societies and their Environments in the Amazon - Odisseia[3], we initiated, in 2016, a research process in the region of Santarém, in western Pará state, to collaborate to strengthen family farming in a region faced with rapid change (COUDEL *et al*., 2022). Socioecological observatories are framed as platforms that engage diverse researchers, decision-makers, and social actors to bring together various types of academic and non-academic knowledge related to socioecological systems and inform public policymaking (BOURGERON *et al*., 2018). The Odisseia observatory was inspired by a new generation of observatories that promotes a more active role of citizens in knowledge coproduction processes to encourage environmental governance involving society (LIU *et al*., 2014). As Liu *et al*. (2014) state, raising awareness of a problem should not be limited to alerting the public about it but requires involving citizens in understanding it so that they can make informed decisions for themselves.

Thus, since the beginning of the Odisseia Observatory, we established a partnership with the Family Farmers and Rural Workers Unions (*Sindicato dos Trabalhadores e Trabalhadoras Rurais* - STTR) of the municipalities of Santarém, Belterra and Mojuí dos Campos to co-construct the themes to be investigated. Contamination by pesticides emerged as one of the priority research axes. In 2019, the observatory launched a data collection campaign on Family Farming in the region, encompassing, among other questions, questions regarding respondents' perception of the impact of soy advance on their families and the use of pesticides by family farmers (COUDEL *et al*., 2022). Parallel to conducting interviews through questionnaires, researchers associated with the project investigated environmental and human exposure to pesticides in the Santarem Plateau region. Both research processes raised worrying data regarding the impacts of pesticides on the environment and family farmer communities.

Given the scope of the research, we were invited to present the results at the Regional Forum to Combat the Impacts Caused by Pesticides. When this forum was created in 2017, its promoters wanted to transform it into a space for debate and action proposals. However, in a territory where agribusiness is predominant, the discussion about the impact of pesticides faces many obstacles. This experience made us question how the political dismantling and disarticulation of social participation spaces have contributed to the production of invisibility regarding pesticides. In order to understand this question, we conducted an analysis at two levels: we examined the emergence of pesticides as a public issue and the dismantling of public policies and participation spaces regarding this issue in Brazil; and in the territory of the metropolitan region of Santarém (which also includes the municipalities of Belterra

and Mojuí dos Campos), we studied the creation and then the dismantlement of the Regional Forum to Combat the Impacts Caused by Pesticides in the Lower Amazon.

Our analyses and reflections were based on the process of co-construction of the Odisseia Observatory (see COUDEL *et al*., 2022). During this process, we mobilised different research methods and several materials in this engaged reflection (MARTINEZ-ALIER *et al*., 2011), such as organising workshops with researchers and local actors to interpret the results of the data collection campaign and identify the factors that influenced the (in)visibility of pesticides in the Santarém region. We also interviewed actors in the territory, such as farmers, union representatives and public institutions, to understand their involvement in the debates about pesticides in the territory of Santarém. Finally, we conducted participant observation through the involvement of some authors in local institutions, participating in meetings, in particular, the Regional Forum to Combat the Impacts of Pesticides.

2 EMERGENCE, INSTITUTIONALISATION AND INVISIBILIZATION OF PESTICIDES AS A PUBLIC PROBLEM

2.1 THE EMERGENCE OF PESTICIDES AS A PUBLIC PROBLEM

Pesticides were first mentioned in Brazilian legislation in 1934, through the decree 24.114/1934, in the first government of Getúlio Vargas (1930-1945). However, this presidential decree did not include any classification for toxicological inspection of these products. This decree remained in force until 1980 and encouraged multinationals such as Bayer or Ciba-Geigy, through reduced taxation, to import and manufacture pesticides in Brazil, including molecules that were already controversial and obsolete in other countries (FRANCO; PELAEZ, 2016; TERRA; PELAEZ, 2008).

From the 1960s, the agricultural sector in Brazil underwent significant changes due to the adoption of technological packages of the Green Revolution (TERRA; PELAEZ, 2008); the industry and government were presenting agrochemicals as beneficial "medicines" for rural populations and crops (FIRPO PORTO *et al*., 2015). This greatly favoured large-scale industrial agriculture, promoted by the government and the agrarian elites as a synonym of development, while peasant family farming was considered a backward movement (BERTRAND, 1973).

As a counterpoint, since the 1980s, different social movements, in particular the Pastoral Land Commission (CPT), have been warning against the problems of environmental pollution and risks of exposure of workers and residents of rural areas to agrochemicals, framing the issue of pesticides for the first time as a public health problem (FIRPO PORTO; ROCHA; PACHECO, 2015). They also denounced the strategies of large landowners, who use pesticides as a "*weapon of chemical and criminal warfare*" to expel rural populations from their lands (FIRPO PORTO; ROCHA; PACHECO, 2015, p. 136). Thus, along with the struggle for agrarian reform, social movements have gradually integrated actions to eliminate pesticides as an integral part of their demands in land defence (FIRPO PORTO; ROCHA; PACHECO, 2015).

However, this new agenda of social movements found little echo in the scientific community at the time. The literature on the subject often attributes the possible problems related to pesticides to the misuse of these products by rural workers and ignores their broader impacts on rural populations caused by spraying in large-scale agriculture. Only a few researchers from Fiocruz, the Brazilian health research centre (GURGEL; FRIEDRICH, 2020; PERES; MOREIRA; DUBOIS, 2003), and some faculty members from public universities (BOMBARDI, 2017; MORGADO; PASSOS, 2018; PIGNATI *et al*., 2017; PIRES *et al*., 2020; SOUSA PASSOS, 2006) conduct work on this topic but find little funding for their research, besides running the risk of being subjected to harsh criticism (and even threats[4]) from the scientific community and agribusiness.

In the case of the Amazon region, this theme has been gradually included in research agendas associated mainly with the advance of soy. This highly mechanised crop pressures family farmers to sell their land to more capitalised owners (BARBOSA; FERRER, 2015; FEARNSIDE, 2006). Although several studies have highlighted the impoverishment of populations and land exclusion (FAVARETO *et al*., 2019; SAUER, 2018), the impact of pesticide spraying on populations around soybean fields still receives little attention.

2.2 CONSOLIDATION OF PESTICIDES AS A POLITICAL AGENDA

With Brazil's democratic transition after the military regime (1964-1984), the public space opened up to different social movements, and family farming became an important category within Brazil's food security and nutrition policy (PINTON; SENCÉBÉ, 2019). However, at the same time, the latifundia system was being transformed into an increasingly organised agribusiness (LACERDA, 2011; POMPEIA, 2021), receiving significant support from the state in order to secure Brazil's position as a leader in the international commodities market.

With the rapid expansion of grain monoculture, especially soy[5], Brazil became the world's largest consumer of pesticides in 2008 (FROTA; SIQUEIRA, 2021). Soon after, it became the world's largest importer of pesticides, while China became the largest exporter. In 2015, soybean crops alone accounted for 63% of pesticides used in the country (PIGNATI *et al*., 2017).

The 1988 Constitution, which emerged from a constituent assembly involving a wide diversity of sectors of society, represented a milestone for Brazilian politics, affirming environmental protection as a national value and institutionalising social participation. This allowed social movements to rapidly approve the "Law of Pesticides" (n° 7.802/ 1989) (FRANCO; PELAEZ, 2016; PELAEZ *et al*., 2015; PERES; MOREIRA; DUBOIS, 2003). At the time, this legislation was considered cutting edge compared to European legislation[6], as it was based on the concept of "evidence of dangerousness," allowing the prohibition of the sale of considered dangerous products.

Gradually, several institutions were created to support family farming. In 1999, under Fernando Henrique Cardoso's government (1998-2002), the Ministry of Agrarian Development (MDA) was established and became responsible for formulating specific policies for family farming. As the Workers' Party came to govern (2003-2016), different channels of participation set the issue of pesticide impacts on the political agenda. However, these advances continue to coexist in unequal terms, regarding the capacity of political influence and funding, with agribusiness, which also has its ministry (Ministry of Agriculture, Livestock and Supply - Mapa). The agribusiness sector promotes itself as a guarantor of food security in Brazil and the world, despite data showing that family farming is responsible for providing most of the food consumed by the Brazilian population. In this sense, movements supporting family farming defend food sovereignty and the recognition of the right of people to define their food policies and practices and to enjoy healthy and pesticide-free food (PINTON; SENCÉBÉ, 2019).

Although three successive governments of the Workers' Party have been insufficient to reverse the power asymmetries between agribusiness and family farming, important advances were made to strengthen the latter, particularly around the concept of agroecology (FLEXOR; GRISA, 2016). The "Permanent Campaign Against Pesticides and for Life", launched in 2011, is a good example of the mobilisation of social movements (TYGEL *et al*., 2014). From 2011 to 2015, 278 demonstrations against pesticides were registered, with the participation of more than 150,000 people (FIRPO PORTO; ROCHA; PACHECO, 2015).

In the context of increased consumption of pesticides, this political articulation of civil society received new impetus with the promulgation, in 2012, of the National Policy on Agroecology and Organic

Production (Pnapo), intending to integrate, articulate and adapt public policies that contribute to the sustainable production of healthy food free of chemical contaminants. In 2013, the National Commission on Agroecology and Organic Production (Cnapo), created to bring Pnapo to life, promoted social participation in elaborating the National Plan to Reduce Pesticide Use (Pronara). However, the policy instruments needed to implement Pnapo, including Pronara, were never implemented due to the impeachment of President Dilma Rousseff in 2016 (SABOURIN *et al*., 2020).

2.3 BRUTAL DISMANTLING AND RETURN TO INVISIBILITY OF THE EFFECTS OF PESTICIDES

After 2015, with the political and economic crisis that shook Brazil, resulting in the impeachment of President Dilma Roussef, the advocates of industrial agriculture and chemical industry lobbies returned with more force. This led to the gradual dismantling of public policies supporting family farming and agroecology (NIEDERLE *et al*., 2019, 2022) and the removal from the agenda of issues related to the socio-environmental impacts of pesticides (SOUZA *et al*., 2020). This deconstruction is accompanied by a rhetorical shift: using a neoliberal argument in favour of large private groups, agribusiness representatives support the use of pesticides in the name of progress and modernisation of agriculture (VOLLMER; TONDATO, 2020), blaming social movements for opposing the country's development (CARNEIRO, 2015).

The influence of agribusiness was particularly exacerbated during Jair Bolsonaro's government after the sector played an important role in the 2018 presidential elections (POMPEIA, 2021; VOLLMER; TONDATO, 2020). The Parliamentary Front for Agriculture and Livestock (FPA), which brings together representatives of the agribusiness agendas also present in other governments, represented almost half of the National Congress (parliament and senate). This new power structure established a series of measures favouring large-scale monoculture, pesticide use, land concentration, and the predatory exploitation of natural resources while dismantling the advances of the previous decade in favour of family farming and agroecological transitions (NIEDERLE *et al*., 2022). The most symbolic example was the extinction of the Ministry of Agrarian Development and several of its policies and management instruments. The spaces for social participation in policymaking were completely closed (SABOURIN *et al*., 2020).

Environmental regulation has been progressively aligned with agribusiness interests, and the Bolsonaro government promoted, through an alliance between the Ministries of Environment and Agriculture, an invisibilisation of the effects of pesticides. The annual average of new commercial formulations of pesticides approved by the government increased from 140 to 443 between 2017 and 2019 thanks to the simplification of the registration process of these compounds (SOUZA *et al*., 2020). In parallel, the toxicological classification of products already on the market was simplified, reclassifying 90% of products previously considered as "extremely toxic" into classes of "slightly toxic" or "unlikely to cause acute harm." The requirement to have the pictogram of a skull as a symbol of a threat to life is excluded from Class 4 and 5 labels (GURGEL; FRIEDRICH, 2020), which severely limits the knowledge of the dangerousness of these products by a significant portion of rural workers who have a low level of education (SOUZA *et al*., 2020).

Since 2002, a bill proposed by then Deputy Blairo Maggi, who served as Minister of Agriculture from 2016 to 2019, has been moving through the legislative institutions. Called by pesticide advocates as the "Safer Food Law" and by critics as the "Poison Package," this bill aims to institutionalise these simplifications in the registration, circulation, inspection, and storage of pesticides, among others. At the end of 2022, an important mobilisation of social movements prevented this bill from being included in the last legislative session of the Bolsonaro government (GREENPEACE, 2022). However, the vote in the congress's plenary should take place during 2023, where the rural caucus is still very strong.

3. PROGRESSIVE CONSTRUCTION OF EVIDENCE IN THE SANTARÉM REGION

3.1 SANTARÉM, A FRONT FOR SOY AND AGROCHEMICAL EXPANSION

Due to its location at the intersection between the Amazon River and the federal highway BR-163, the Santarém region has become, since the early 2000s, a strategic front for soybean monoculture expansion (SAUER, 2018). After the construction of a grain export port in 2003 by Cargill[7], in less than 20 years, 80,000 hectares of monocultures (soy, corn, sorghum) were established, now representing 60% of the territory's non-forest areas (CORTES *et al*., 2020), as represented in figure 1.

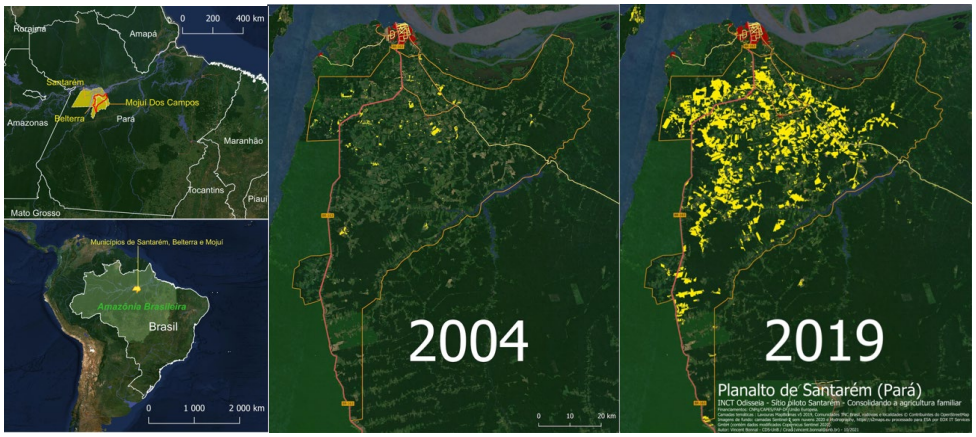

Figure 1| Soybean expansion in the territory of the Santarém Plateau (including part of the municipalities of Santarém, Mojuí dos Campos and Belterra) between 2004 and 2019.

Source: Vincent Bonnal (INCT Odisseia)

Violent conflicts arose, caused by land speculation and the progressive concentration of land, leading to the expropriation of traditional populations and family farmers who had been present in the territory for several generations, pressuring them to migrate from rural areas to urban centres (CÔRTES; D'ANTONA, 2016), even causing the extinction of entire communities (SAUER, 2018), see figure 2. These effects, along with a rapid growth in the use of pesticides in soybean plantations, have been ignored by public authorities, lured by the progress that agribusiness promised to bring to the region (GAYOSO DA COSTA, 2012).

Figure 2| Cemetery in the middle of the soybean fields in Belterra, illustrating the extinction of rural communities

Source: Image by Vincent Bonnal, November, 2021

Since the 1970s, the STTRs have been organising collective actions to defend the territorial rights of the populations. However, only since 2010 has the issue of pesticides become the object of strategic actions, based on the observation of the increase in cancer cases in communities surrounded by soybean cultivation. A working group was created to address this issue, involving municipal health authorities, the Regional Hospital of Western Pará, the Municipal Department of Agriculture, and the association of residents of the most affected community. At the time, of the 200 families living in this community, at least 12 people were oncology patients being treated at the regional hospital. However, the residents' association ended its participation in the working group in 2014. The union representatives cite pressure exerted on the residents by soybean farmers in the community. No clinical effects studies have been conducted since then, although several research groups have begun exploratory investigations, often with little or no funding.

3.2 PRODUCING SOME FIRST DATA ON THE IMPACT OF PESTICIDES

Given the difficulties in quantifying the impacts of pesticides on family farmers, the STTRs raised this issue when we started the Odisseia Project activities. The data we collected with the unions show that 76 per cent of the family farmers interviewed consider soybean expansion negatively impacting them and their families (for more detailed results, see COUDEL *et al*., 2021; COUDEL; PASSOS; SCHWAMBORN, 2020). They do not produce soybeans, but they have farms near soybean fields. About 6,000 family farming families still live in the rural communities of the Planalto Santareno, compared to 89 soybean entrepreneurs identified in 2017 (IBGE, 2018).

According to the families interviewed, several health problems arose after the arrival of soy. Of the farmers who live within 100 meters of a soybean field, 60% report discomfort when neighbouring crops are sprayed. Chronic illnesses appear gradually, and their effects persist over the long term. One hundred and three (103) families out of 544 report suffering from serious health problems (19%), and of these, 70% of families report suffering from acute and constant headaches, 23% report having chronic lung diseases (asthma, tuberculosis, bronchitis, pneumonia) and 6% report having had a case of cancer in the family.

Other effects concern the production of family farmers. Among farmers who live less than 500 m from a soybean field, 47% report having lost production, mainly because of pests (e.g., locusts, whiteflies) that take refuge on their plots due to pesticide spraying in their surroundings. Faced with the loss of production due to pests, farmers report that they have also started using pesticides. Almost half (48%) of the farmers interviewed use pesticides, and the proximity of soybeans significantly influences this use. Farmers speak of a "vicious circle of poison". The sprayings of pesticides on soybean plantations affect family farmers in such a way that it practically makes it impossible for them to stay in the area, leading them to sell their land to the soybean growers. These, in turn, expand the borders of their properties to other farmers, who suffer the same impacts as their former neighbours and eventually sell their land.

The productive dimensions of pesticide impacts, little discussed in the scientific literature, are emphasised by family farmers not so much for economic reasons but because they affect their survival as farmers in the short term. The loss of production challenges their food sovereignty, both the ability to produce enough food to feed their families and to sell and also the ability to have access to healthy food.

A study conducted by biologists of the team confirmed the presence of glyphosate residues in 72% of water and sediment samples taken from different streams in Santarém and Mojuí dos Campos (MORGADO, 2019). The values were below the limits of Brazilian legislation and above other countries' legislation, such as Canada and the European Union. Another study detected glyphosate presence, at high limits, in all 27 human urine samples from residents of rural communities (SCHWAMBORN, 2019). These studies reinforce the credibility of farmers' perceptions.

Epidemiological studies of clinical effects have not been conducted, as these are particularly difficult and especially financially costly to conduct, and community health units are unaware of the diversity of symptoms that can occur due to pesticide spraying. Furthermore, political pressure constraints, and it ends up preventing and silencing the reporting of poisoning cases; according to several interviewees, a nurse at a health unit was dismissed by the municipality of Belterra in 2019 because she reported a case of pesticide contamination. The regional hospitals, enquired by some fellow researchers to provide data on chronic respiratory diseases or cancers, did not respond to these requests.

The community researchers who collected the data reported that they were taken aback by the number of people who, although probably affected by the pesticides, did not dare to say that they perceived a negative impact. The community researchers observed families who had to close the windows of their homes and did not go outside when spraying occurred, yet responded negatively to the question about whether they felt affected by soybean crops. The community researchers could not tell if this was because of fear of opposing soy, presented by local governments as "progress," or because they lacked information about the dangers of pesticides. Many families have little access to information and do not necessarily understand the symptoms when they occur, and feel unaffected. It is very likely, therefore, that the survey results underestimate the problem. As pointed out by Dedieu and Jouzel (2015) and Fillion and Torny (2015), when a society does not recognise a public health problem, victims tend to minimise the problem or consider it "inevitable".

Even so, the interviews and the biophysical analyses confirm the experiences the farmers' unions reported, validating that they are not "isolated cases" (FILLION; TORNY, 2015). During the meetings held to present the research results in the communities, this result was one of the most commented on by the community participants. Seeing that this is a reality shared by most farmers, they begin to understand that they are not the only ones with these difficulties.

3.3 THE FORUM TO COMBAT THE USE AND LIMIT THE IMPACTS OF PESTICIDES, A SPACE FOR VISIBILITY?

Impulsed by the STTR of Santarém and with the coordination of the Public Prosecutor's Office of the State of Pará, a Regional Forum to Combat the Use and Limit the Impacts of Pesticides in the Lower Amazon was created in 2017, motivated by national initiatives such as the national Permanent Campaign mentioned earlier and other regional initiatives[8]. In the Santarém region, the Forum has 29 members, including civil society, research and extension institutions, and public agencies. The objective of the Forum is to build a public agenda on the issue of pesticides, still marginal in the region, and to raise awareness around these products' risks and impacts.

Through regular meetings and events, this Forum has become a space for debate and inter-institutional relations to promote research and collective action to address the impacts of pesticide use. For example, the Forum promotes debates on various topics, such as human exposure to pesticides, the impact of pesticides on bee populations, and the illegal sales of pesticides. Through the Forum, negotiations have been initiated between institutions and pesticide salespeople for the construction of a deposit to collect used containers (required by law) since many farmers reuse pesticide containers for water storage, for the sale of food, or discard them in nature.

Faced with several complaints from rural community residents and leaders about the possible impacts and indiscriminate use of pesticides on the Santarém plateau, the public prosecutor who chaired the Forum in the first years insisted on the importance of having scientific information in order to qualify the court cases better. This request led to the signing of a technical cooperation agreement between Forum member institutions and local research institutions, particularly the Federal University of Western Pará (Ufopa).

In 2019, as Odisseia, we were invited by the Forum to present some first results of our studies on pesticides, and the participants underlined the importance of making the results available. In the seminar for the official presentation of the results, organised by the STTRs together with the Odisseia project team in December 2020, one of the public prosecutors present stressed: "this data should be in the hands of the communities, to put people in the social control of public power.

In August 2021, the Forum organised an extraordinary meeting to discuss the previously published results. Approximately twenty people attended this meeting, which was divided into two sessions. After a general presentation of the results during the first session, the participants agreed to continue the discussions with a second session two weeks later to define, by working groups, the concrete actions to be taken. Different proposals were made, such as presenting the results to policymakers, preparing pedagogical material for schools, and seeking international media for dissemination. One of the main ideas that emerged during the debates was to draft a bill to be presented at the municipal level to establish a pesticide-free zone, inspired by other experiences in Brazil or the world[9]. At the end of the second event, one of the actors said: "Finally, we have hope that things will change". However, this dynamic did not follow, and the Forum was progressively dismantled.

3.4 DISMANTLING, DISARTICULATION AND INVISIBILISATION OF THE PESTICIDE AGENDA

During 2019, before the presentation of our results, political friction arose within the Forum. The representatives of the soy producers[10], together with the representatives of the pesticide trade, defended a position in favour of controlling spraying and residue treatment and stated that the indiscriminate use of pesticides is not the fault of large producers who follow the recommendations, but of family farmers who do not know the application protocols. These actors repeated this narrative in another Forum meeting in 2022. This discrediting strategy, often used by companies selling

pesticides (DEDIEU; JOUZEL, 2015; FILLION; TORNY, 2015), seeks to individualise and blame the victims, thus rejecting their responsibility.

In contrast, the actors representing social movements, including the Pastoral Land Commission, are against any pesticide use, including by family farmers themselves, because they consider it an illusion to think that pesticides can be used in a controlled way. In addition, they relate the use of pesticides in soy farming to cancer cases and waterways pollution throughout the territory. They defend an agroecological agenda and the implementation of alternatives to agrochemicals, using research results to support their arguments.

Gradually, groups of soy producers and traders began to oppose the Forum systematically, sending letters to the Public Prosecutor's Office, questioning the data presented and disrupting the Forum's plenary meetings. Both the public prosecutor's office and the STTR of Santarém consider dialogue with agribusiness about pesticides necessary, but they have noticed that in the Forum, the debate has become a "war of narratives" (a term used in an interview), where the parties no longer want to hear each other.

In addition, the dismantling of national family farming policies as of 2019 impacted the local level. Technical assistance institutions (e.g., Emater, the agricultural extension agency) and agencies linked to the Ministry of Agriculture, which supported the implementation of alternatives to pesticides, saw their funding reduced. National support to combat the impacts of pesticides and promote agroecology was drastically reduced as the National Campaign against Pesticides ran out of resources. The Santarém Regional Forum had no means to continue its activities except for the motivation of its members. With the Covid-19 pandemic, it ceased to function. Its activities resumed with the extraordinary meeting held to discuss the results of the Odisseia Project (with selected guests, we learned later).

In October 2021, the public prosecutor in charge of the Forum was removed and transferred to another agrarian court in Pará. In 2022, a few meetings were held with the Forum members to reorganise their actions and define their strategies for action, but tensions remained visible. With the change of the person responsible for the Forum in the Public Prosecutor's Office, and considering the increase in political tension, a strategic shift was taken, from a focus on combating pesticides to a reflection more focused on agro-ecology and organic production, aiming at actions to strengthen these forms of production without pesticides.

Farmers in the communities we work with also reported that, in the Bolsonaro political context, tension and fear of confronting soy farmers increased, as they felt they would no longer have support from the state in case of disputes. The new president of the Santarém family farmer union, elected in October 2021, received death threats soon after her election[11]. This situation raises questions about the risks related to the information we co-produced, potentially increasing conflicts between farmers, union leaders and local elites in a context of invisibilisation and discrediting of science by the Bolsonaro government and society.

With the change of federal government in the elections of 2022, the previous articulations are progressively being resumed, and the federal actors can defend public rights again. In March 2023, a soy producer was fined more than 1 million reais by Ibama, the National Institution for the Environment, for having caused the intoxication of students and teachers of a public school in the municipality of Belterra. This case had been notorious for years, with repeated reports of intoxication of students, and the population had complained many times without receiving any response from the public authorities. They finally received the visibility they deserved.

Faced with the failure of public authorities to guarantee the rights of rural populations, organised civil society has been developing its own strategies to defend territories in the face of concrete advances in sectors linked to agribusiness, illegal logging and mining, among other threats. The NGO

Terra de Direitos[12] compiled a report based on evidence collected in the territory of Santarém to demonstrate how Cargill, a multinational company that owns the Santarém soy export port, is directly responsible for the negative impacts caused by soy in the Santarém region, especially those linked to pesticides (TERRA DE DIREITOS, 2021). Thus, in a strategy of *claiming* collective reparation (FILLION; TORNY, 2015), the responsibility of industries is being questioned, in this case, that of Cargill as the representative and main promoter of the soy production sector.

4 CONCLUSION

In Brazil, the issue of pesticide impacts became a public issue thanks to the social participation spaces that emerged in the 2000s. However, with the return of conservative elites to power and the dismantling of public policies favouring family farming, they became invisibilised from the national political agenda. In a context open to collaboration, we started the construction of a citizen observatory in the region of Santarém, together with the STTRs, to investigate, among other issues, the effects of pesticides on family farmers.

Institutional recognition of the social and environmental impacts of pesticides in the Santarém region is almost non-existent, although family farmers have reported being affected by them since the arrival of soy in the region in the late 1990s. This recognition has faced many obstacles due to pressure from soy producers and their political allies. To this end, they use several methods, such as intimidating family farmers in their communities, using discursive elements to convince society that large-scale agriculture is synonymous with progress, and protesting in the spaces created to discuss limiting the impacts of pesticides, among others.

Although the results of the Odisseia observatory are preliminary, some articulation processes are emerging to bring visibility to the issue of pesticides. Using Pillon and Torny's (2015) concepts, the results presented at community and union meetings have allowed the region's farmers to perform a *naming* action, beginning to recognise themselves as common victims of a phenomenon that goes beyond isolated testimonies. However, although soy farming is generally largely responsible, family farmers do not wish to create direct conflicts with neighbouring soybean farmers and instead propose conciliatory solutions, for example, discussing spraying hours. Some NGOs are proposing to support *collective claiming* actions holding Cargill accountable, blaming the company for expanding the soy industry in the Santarém region. However, the outcome of such action in a context dominated by a strong agribusiness lobby remains unlikely.

Faced with the dismantling of democratic spaces, in which social organisations had the strength and articulated proposals, social movements are reorganising to prepare new strategies and modes of political action. In this context, the defence of food sovereignty and agroecology prove particularly aggregative and promising (PINTON; SENCÉBÉ, 2019), allowing the promotion of positive alternatives, as shown in France by Aulagnier and Goulet (2017). Thus, the family farmer unions argue that while it is critical to continue awareness-raising work to reduce pesticide use, having a positive agenda is more mobilising with decision-makers who, for the most part, consider soy to bring development. The unions wish to evidence that the consolidation of family farming is also fundamental for the future of the region, whether to ensure food sovereignty, preserve the environment, empower women, or guarantee decent work in rural communities, as many authors have shown (ALTIERI; TOLEDO, 2011; PRÉVOST; ESMERALDO; GUETAT-BERNARD, 2014). This opens important avenues of collaboration for us within the Odisseia observatory to better understand ongoing agroecological experiments (PIVA *et al.*, 2022) and what conditions would allow farming communities to consolidate from these initiatives.

NOTES

1| Since 2008 Brazil has been among the top three pesticide consumers per capita, ahead of China and the United States (FAO, 2021).

2| For example, the maximum residue limit of glyphosate in drinking water is 5000 times higher (500 µg/L) in Brazil than allowed in the European Union (0.1 µg/L). Regarding the effects on human health, studies point out that between 2007 and 2014 there were approximately 18,000 acute poisoning by pesticides; however, it is estimated that for every recorded case of poisoning, there would be approximately 50 unreported cases (BOMBARDI, 2017).

3|Although in this article we refer to Odisseia, it is actually a double project, combining the European H2020 Odyssea project and the Brazilian INCT Odisseia project. Both stand for: Observatory of the Dynamics of Interactions between Societies and their Environments. The institutions coordinating the project are the University of Brasília (UNB), the Research Institute for Development (IRD) and the International Center for Agricultural Research for Development (Cirad), with the collaboration of many other Brazilian and European institutions, including the Federal University of Pará (based in Belém) and the Federal University of West Pará (based in Santarém). These projects are presented on the following websites: https://www.odyssea-amazonia.org/ and http://odisseia.unb.br/ .

4| We will return to this point when we discuss the dismantling of policies under the Bolsonaro government. Researcher Larissa Bombardi, for example, had to go into exile in 2021 after receiving death threats (REDE BRASIL ATUAL, 2021).

5| Soy is the large-area crop for which the most pesticides are used, reaching 19 kilograms per hectare in the Amazon, where heat and humidity favor fungi, while in the rest of Brazil it is 8 kilograms per hectare and in Europe 2 kilograms per hectare (PIGNATI *et al.*, 2017).

6| In Europe, this “evidence of dangerousness” criterion was incorporated into the regulation in 2009 and implemented in 2011 (FRANCO; PELAEZ, 2016).

7| A multinational company specializing in the trade of raw materials, particularly soybeans, Cargill is the world's largest agribusiness in terms of capital, with $113.5 billion (AGROMEDIA, 2020).

8| Other Forums exist in Brazil, such as the Tocantinense Forum to Combat the Impacts of Pesticides, the Bahia Forum to Combat the Impacts of Pesticides (FBCA), the Goiás Forum to Combat the Impacts of Pesticides, the Espírito Santo Forum, the Rio Grande do Sul Forum.

9| In particular the experience of Florianópolis, capital of the state of Santa Catarina in southern Brazil.

10| Represented by SIRSAN, Sindicato dos Produtores Rurais de Santarém.

11| This type of threat is not insignificant in Brazil, which is one of the countries with the highest levels of rural violence. The state of Pará is the one where the most murders of peasant leaders occur, with more than 1,200 death threats and 320 murders since 1996. This violence has increased since the return to power of the land elites in 2016 (REDE BRASIL ATUAL, 2021).

12| Founded in 2002 in Curitiba, this Brazilian organization of "popular defense (...) works with collective and community demands, in partnership with popular social movements, recognizing them as active subjects of the social process and of the fights for rights.”

ACKNOWLEDGEMENTS

We are so grateful to the farmer leaders for their trust and partnership, to the young community researchers for their enthusiasm and to all the farmer families for their warm welcoming. Many academic researchers contributed in this project, we thank all our colleagues for the rich debates with them, with special credit to Vincent Bonnal for the map elaboration. The project leading to this article has received funding from the European Union’ s Horizon 2020 Research and Innovation programme ODYSSEA under the Marie Skł odowska– Curie grant agreement N° 691053 and the project INCT n° 16-2014 ODISSEIA, with funding from CNPq/Capes/FAPDF. The research was validated by the Research Ethics Committee (CEP) of the University of Brasília onOctober 25, 2018, with the certificate n. 95385318.7.0000.5540.

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