



IT IS WHAT IT IS

LOCAL RESISTANCES AND LIFE-SUSTAINING STRATEGIES IN WESTERN ALMERÍA'S AGRO-INDUSTRIAL PLASTIC SEA

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Abstract

It Is What It Is: Local Resistances and Life-Sustaining Strategies in Western Almería's Agro-Industrial Plastic Sea.

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This thesis is centred on a group of agricultural workers and farmers in western Almería's Plastic Sea. It proposes a shift in the conception of sustainability within the agro-industrial cluster that includes workers' experiences of resistance and their life-sustaining strategies maintained across generations through the family farming model. I suggest that the knowledge of 'el modelo familiar' (the local family farming model) is comprised of a set of specific relationships that farmers have with their environment, which differentiate them from other farmers and help them cope with the pressures of price, time and quality control coming from the agriculture industry. Central to my approach is the assertion that sustainability knowledge is enacted in a socio-ecological system that encompasses a non-dualistic individual and their environment - in its human and non-human aspects. I have looked at all these dimensions through a methodology that includes apprenticeship, participant observation and participatory filmmaking, and with the objective of giving voice to local feelings of misrepresentation.

The film *Esto es lo que hay* (It Is What It Is), which accompanies and constitutes part of this thesis, narrates a story of farmers' resistances, providing an overview of the multifaceted knowledge of sustainable living and life-sustaining strategies upheld by some agroecological farmers who were previously part of the intensive agriculture industry. I recommend watching the film when suggested in the middle of chapter 3.

Declaration

This work has not been submitted in support of an application to any other degree or qualification at this or any other university or other institute of learning. Chapter 5 has already been published in the Journal of Visual Ethnography, as a first publication of this thesis. However, the original research stems from the work of this thesis.

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Introduction

Research focus

This thesis explores forms of sustainable living at the margins of industrial agriculture. The thesis aims to make visible diverse and localised ways of addressing sustainability in an increasingly industrial and globalised agricultural region. Aligning with local activist groups seeking eco-social change, the thesis argues that local sustainability strategies can provide practical examples of how we can re-value the “biosphere as the total system and the economy as the subsystem” (George, 2004:50). These should not be seen as strategies to fix or patch current industrial structures, but as methods of downscaling and restoring value to the central contribution of small farmers and labourers in shaping labour structures for sustainable production. Agricultural production is dependent on the energy invested by workers and nature, a mutually beneficial energy exchange that Podolinski termed the *ecoenergetics* of production. Following his research, this thesis argues for a sustainability analysis, wherein the social and environmental aspects of agricultural production and the human relationships within the industry are placed at the core of the analysis.

The study focuses on intensive agro-industry in western Almería, southern Spain. Cultivating over 1,700,000 tons of vegetables a year to be distributed across Europe, it is considered the largest concentration of plastic greenhouses in the world. Furthermore, the technification of agriculture in the region has displaced the autochthonous flora and fauna, polluted its two subsurface aquifers, eroded the soil, and dispossessed farmers of their right to a sustainable agricultural livelihood through seed patenting and hybridization (Shiva & Mies, 2014; Escobar, 2016). Through processes of intensification and technification, the agro-industrial cluster has created a dynamic of subordination of small farmers and labourers.

As anthropologist Yayo Herrero defines it, sustenance of life requires the acknowledgement that humans are both interdependent and eco-dependent (2013:281). From this angle, sustainability is understood as the endeavour to nourish, support and care for nature and other humans in order to continue generating life. Western Almería's 'Plastic Sea', sustained on fossil fuel derivatives, external inputs and cheap labour, reveals an inherently unsustainable system, despite the marketized image of sustainability presented to supermarkets and consumers. In a hierarchical structure resulting from the imbalance between natural and economic cycles, commercialising agents oppress farmers and the farmers in turn oppress labourers, while all suppress and become alienated from nature. The paradox is that within the industry, workers and nature are continuously engaged in the sustainable activities that constitute strategies of adaptation to the persistent forces and demands of the industry. Whether by intention or not, sustainability emerges from the bottom up, with the aim not of changing the system, but of sustaining life in the region. This research pays attention to these types of sustainabilities by exploring how regional agricultural workers and nature interact with each other as active entities, redefining and transforming workers' agency.

I conducted my research in Spain, west of the city of Almería, predominantly in and around the towns of *El Campo de Dalías* (The fields of Dalías), including the districts of El Ejido, Adra, Balanegra, Balerma, Almerimar, Santa María del Ágila, Las Norias de Daza, La Mojonera, San Agustín and Dalías. I also worked in nearby towns including Berja, Almócita, Vícar, Las Hortichuelas, Nijar, Campohermoso, and Almería city. Over these territories the agricultural industry is conceived as a unitary entity, constituted of local businesses, such as family farms; middle size companies who buy the produce from farmers and package and distribute it from centralised warehouses, such as local cooperatives and commercialising houses; and transnational corporations providing inputs in the productive structure. The types of labour examined are varied according to the different echelons of the industry, including labour at the farm, involving farmers and paid labourers; labour at the commercialising houses, involving packaging, distribution, sales and administrative workers; and scientific labour,

involving research institute workers and field agronomists (D'Eusanio et al. 2017). Within the different types of labour, it includes autochthonous and migrant workers, as well as temporary and stable workers adjusted to the seasonality of horticultural production within the industry.

The industry's activity per se does not guarantee a single status of labour. Becoming an industry worker requires advanced university training at the higher echelons, such as field agronomists, and manual training at other echelons, such as paid labourers at the farm. Labour stability is also contingent to the different echelons. Maintaining the stability of one's job at the lower echelons requires acquiring practical experience, obtaining training in food handling and maintaining a healthy network of contacts to be re-hired from one harvest to the next. This is especially the case for day labourers and packaging workers, where temporary contracts are the norm.

For these workers knowledge is articulated socially, through person-to-person exchanges. In the case of migrant workers, these exchanges take place on the evenings at the town squares and main roads, where they meet after the labour journey. Often grouping by nationalities, with a predominant presence of Moroccan males, the largest migrant group, their concerns relate to labour and housing opportunities, labour rights, union support and labour dynamics, among others. Autochthonous workers also rely on socially articulated knowledge through relatives and networks of relatives' friends. In this case, the exchanges are made by phone, through social media, or outdoors in the town bars and cafés and concern available work positions, labour conditions at the different companies, and the internal recommendations active workers can make for those looking for work.

Farmers have a special position within the chain, because while being non-qualified workers in charge of small family farms, they are also business owners, whose activity is fundamental for the industry to function. As such, their knowledge is derived from a combination of the scientific advice of the field agronomists visiting their farms, the commercial advice of the sales agents at the commercialising houses, and their social

exchanges with other farmers and industry workers in the town space. By contrast, in administrative, commercial and scientific positions that require university training, knowledge is locally articulated through corporate reports, scientific articles and formal jobs postings. Social exchanges also take place with other members of the corporate sector and the scientific community at national and international horticulture sale fairs and scientific conferences. Local scientists and commercial agents also exchange with farmers and workers on the lower echelons of the chain, but this to present business opportunities and scientific findings, rather than to maintain long-term dialogue with farmers.

The most basic question that gave rise to this thesis emerges from the contrast between co-existing realities within the local industry, characterised as it is both by a strong defence of the sustainability of the local agricultural model, and by a continued dependence on precarious forms of labour, accepting and in some cases enforcing semi-slavery working and living conditions. As a result of this contrast, in the field I developed a need to analyse both the media failure to fairly represent local labour, and the workers' efforts to reshape and improve labour conditions and modes of production within the industry. I found a political motivation, shared by my informants, to re-set the focus on how local workers generate local forms of knowledge and how these shape the sustainability configuration of local family farms and industrial agricultural labour. I came to ask myself two simple questions to which I could not find an answer in the existing literature on the regional agricultural industry: How do workers define agricultural labour when coping with and at the same time resisting existing labour tensions generated by the industry? And, how may visibility be given to workers' localised life-sustaining strategies?

The research seeks to understand how agricultural labour and workers' resistances are configured locally and how they are affected and reformulated through internal and external forms of representation. Posing these questions, I want to investigate the conflicts that arise from the lack of recognition for workers' agency. These include their everyday resistances, forms of survival and social articulations of knowledge

which subtly reshape the structure of the agro-industry, especially in its lower echelons. I make the point that workers' agency and its forms of representation across time have redefined local forms of knowledge, often overlooked by previous studies, which are crucial to understanding the constraints to the long term sustainability of the industry as a corporate structure.

Anthropological studies on western Almería's agro-industry have focused on the 'intensive' and 'extensive' exploitation of migrant workers, which is carried out due to the need to both constantly increase production margins and keep cutting labour costs to balance the agricultural budget at the farms, cooperatives and commercialising houses (Martínez Veiga, 2001:92; Checa, 1995; Entrena-Durán & Jiménez Díaz, 2016). A proliferation of these studies occurred after the year 2000, to try and explain the violent riots and street-fights which took place on the 6-8th of February 2000 in protest against a series of racist acts by local fascist groups, and against overall semi-slavery conditions that included social, labour and housing injustices experienced by migrant workers. These events have been explained employing the endogenous factors of ethnic relations in the region, involving labour exploitation, exclusion, urban segregation, social isolation, ethnic prejudice and xenophobic policies affecting immigrant communities (Checa, 2001:13; SOS Racismo, 2001:11; Calvo Buenzas, 2000:49).

Other more critical studies, following American feminist sociologists, have argued that segregation is not based on endogenous ethnic relations but rather on the dominant autochthonous population's strategies to maintain their racial advantage over local resources and the labour and production structures of the agricultural industry (Río Ruiz, 2002:84; Olzak et. al. 1996). Segregation in relation to racial competition for resources has been studied in the region through the lens of the local labour market (Pumares, 2003; Roquero García, 1996; Aznar Sánchez, 2014), demographic development (Jiménez Díaz, 2011), urban ecology (Martínez Veiga, 1999; Checa Olmos and Arjona Garrido, 2001, 2005), and everyday interactions (Castaño Madroñal, 2000; Checa Olmos et al. 2010). These studies argue that the oppression of the immigrant

population in urban and industrial spaces renders foreigners increasingly vulnerable while maintaining the system of exploitation.

A second group of regional studies have investigated the transformation of the western Almería agro-industrial cluster through structural processes of globalisation, deterritorialisation and reterritorialisation (Molina Herrera, 2003; Mora & San Juan, 2001; Villanueva Pérez, 2002; Jiménez Díaz, 2005). Using political economy as a theoretical framework, they argue that there has been a displacement of local agents and modes of production by global production networks and international regulation, accompanied by local forms of reorganisation designed to sustain local development, autonomy and identity (Jiménez Díaz, 2008:88). These studies have focused on the cluster's infrastructure design and its competition (Valenciano & Pérez Mesa, 2004; Ferraro García & Aznar Sánchez 2008; Aznar Sánchez, 2011), its technological transformation, risk analysis and the influence of multinational corporations (Galdeano-Gómez & Rodríguez, 2000; Pérez Mesa, 2009; Valenciano et al. 2019), the concerns of overexploitation of resources for rural development and the challenges it poses for the long term sustainability of the industry (Pérez Parra et al. 2002; Gascó et al. 2002; Galdeano-Gómez et al. 2011), the processes of intensification on the labour market and its effects on female and migrant workers (Reigada et al. 2017; Arjona Garrido, 2004; Arjona Garrido & Checa Olmos, 2006, 2008; Ruiz Sánchez, 1995; Roux, 1995), and the difficulties with governability and the lack of social sustainability within the industry to the detriment of both its labour force and the local social and ecological capital (Silva Pérez, 2004; Arnalte Alegre et al. 2013). The structural tensions of the industry have also been addressed through a political ecology lens by several studies concerning the industry's ecological footprint and water management (Caparrós Martínez et al. 2020; Cabello Villarejo, 2016; Moragues-Faus, 2016; Cano Orellana, 2009; Wolosin, 2008; Izcara, 2000).

In this thesis I want to make the point that the different groups of studies are leaving out an important component in the constitution of labour within the industry: the actions and processes of change of the labour structure from the point of view of the

local actors involved. These are the forms of social interactions creating empathy and resistance to the processes of marginalisation, competition and segregation; the actual events, modes of production, conflicts, disputes, solutions and adjustments that go on in everyday local agricultural labour processes. The ways in which workers procure work, negotiate their salaries, attend and perform their labour duties, engage in social interactions at work and manage their family and personal relations after work, are all intricacies that still lack description and analysis if the aim is to understand the socio-cultural configurations of labour and its social sustainability with the agricultural cluster.

The absence of a worker-led characterisation of how the activities and logistics of regional agricultural labour impact its workers emotionally has left unanswered three essential questions: 1) What role does the embodied experience of agricultural labour, with its hardships, points of conversion, corporal sensorialities and modes of representation, play in the sense of identity of this group? 2) Are these forms of sensing, interpreting and representing localised labour a ubiquitous form of knowledge across the chain, or a combination of distinct worldviews undergoing subtle transformations at the different echelons of the chain? 3) What relevance does acknowledging these embodied forms of experience have for an understanding of the social sustainability of the industry?

Concept of knowledge: on social sustainability and labour structures

Despite the rapid adoption in the last few years of sustainability protocols in the corporate sector, the concrete meaning of sustainability and its implication for the transformation of global production networks (GPNs), remains diffuse. The social sustainability of labour cannot simply be identified with the management of practices, aptitudes, actors and resources “to address human potential and welfare both within and outside the communities of the supply chain” (Nakamba et al. 2017:527). These categories are used in sustainability studies to set the guidelines for assessing the role

of structures and social elements in industrial systems, to reframe existing protocols and valuation systems in search of system-based frameworks (Janker et al. 2019:34). Even if we bracket problematic terms such as human potential, productivity imbalances, negative externalities and conflicts of valuation, these categories and the agenda of drawing connections between the social, ecological and economic systems in sustainability guidelines come with significant issues.

The search for standardisation leads sustainability specialists to adopt static and easily quantifiable interpretations of the connections between systems. This view conflicts with critical conceptions of sustainability, which define it as a way of being part of an environment that pervades the socio-economic system. In this sense, the very idea of separating economic, environmental and social knowledge becomes the central problem of sustainability assessments, as these are intrinsically interlinked. Within an interconnected sustainability framework, companies are not to act or compete as independent agents but as responsible members of the entire supply chain (Hutchins & Sutherland, 2008; Vachon & Mao, 2008). This makes it crucial to underline how the categories ascribed to labour structures by current sustainability assessments influence how social sustainability might manifest within western corporate conventions, as well as who takes responsibility for its implementation.

In Almería, sustainability certification companies such as Global GAP have risen as the quality mediators between farms and companies. Based on GFSI Benchmarking Requirements created in 2001 by a group of North American and European retailers to harmonise food safety standards, Global GAP implements the Integrated Farm Assurance Standard certificate. This is a set of self-assessment questions audited on a yearly basis by the company. Within their assessment, social and environmental concerns are summarised in three categories: 1) hygiene procedures for the productive infrastructure and for the workers within it, 2) health and safety risk assessments for workers' exposure to toxic or logistic hazards within the productive structure, and 3) action plans for waste production and pollution (Global GAP, 2018:17-40). Given that the certifying body only visits once a year, the daily

implementation of risk assessments is filled out by farmers on paper, without additional monitoring or supervision.

The increasing disconnection between actors across the productive process has confined interpersonal accountability to the moment of exchange, when farmers bring the produce to commercialising houses and cooperatives to be sold, making the liability associated with sustainability protocols inherently negligible both at the farms and at the packaging and distribution stages. This is particularly true when considering social repercussions, which unlike food security issues, are not revealed by the outcome of production. Scientific analyses allow us to know whether production processes respect the use of pesticides by measuring the produce residues, yet labour conditions are not imprinted on the vegetable produced, nor recorded by traceability documents, and thus they become intangible to the production process. Such disregard for the social and environmental production of knowledge as a discrete intellectual product that exists separately from sustainability protocols and corporate accountability is characteristic of corporate compliance schemes. It is also frequent in academic publications from supply chain and management studies, which have been unable to create an informed methodology that allows for a holistic evaluation of social sustainability across supply chains, as D'Eusanio et al. (2019) argue in their systematic review of sustainability literature.

This work aims not only to look at how categorical social knowledge is assessed or quantified to create sustainable business strategies, but to analyse the relationships between retailers and producers, their dynamic transformational capabilities, and how these affect the commodity chain in terms of what they define as socially sustainable (Chkanikova, 2016). The objective is to analyse how workers perceive and sustain eco-social relationships and how these are gradually transformed, or not, towards a socially sustainable agroecological mode of production. The intention is to detail the decision-making process and how different forms of workers' survival and resistance strategies are negotiated, specifically looking at what motivates them and what alternatives to the existing labour system the workers themselves propose

(Saunders et al. 2015).

The project differs from an ethnoscience approach to sustainability because it does not simply aim to classify or categorise how agronomy is reformulated and reconstituted locally (Slikkerveer, 2019; Haverkort et al. 2006; Scoones et al. 2008; Anderson, 2016; Casagrande, 2016). It rejects a vision of the social relations of labour and its environment as isolated, self-contained units that translate local “actions in ways that generify them and that fail to show them to be aesthetic, poetic, and deeply social” (West 2005:639). Instead, it uses a “relational” approach that involves real people and their relationships across overlapping cultures, interaction at the different stages of industrial production and immersion in the urban spaces shared and inhabited by the industry’s workers (Eloheimo, 2013). Such an approach will consider local paradigms, scientific interpretations, social positioning, political determinism and their modes of representation. The study locates social knowledge as emerging from marginalised subjects, including women, migrants and nature, embedded in a local environment that is in constant interaction with global flows and modes of exchange.

This will be achieved by observing and analysing the constructive resistances that question the status quo beyond individual survival strategies and existing justifications of the industry’s actors. The importance of researching these practices lies in the strategies workers use to improve or alleviate the existing inequalities that arise through eco-social relations at work, and whether these could serve as a guiding path to evaluate and inform a participatory form of social sustainability that is locally defined and adjusted to the specificities of local dynamics. By generative everyday resistances I refer to the dynamic, disorganised and often disguised conscious acts of protest that workers perform in order to reconfigure the labour experience to their collective advantage, sustain a long-term continuation of their activities and “minimize domination” (Sivaramakrishnan, 2005:351).

The main generative resistances analysed across the thesis chapters will be, in order

of appearance: 1) The localised efforts to restore the autonomy of the family farm as a contestation of the industrial regulatory push towards corporatism and centralisation; 2) The internal workers' negotiations, overt union resistances and hidden discourses of dignity employed at the farms and packaging warehouses to assert workers' rights and subtly redress existing vulnerabilities; 3) The workers' opposition to the industry's internal and external forms of representation, and our collective local participatory film-making exercise that produced the accompanying documentary film *Esto es lo que hay*, highlighting the complexity of local resistances and meaningful sustainability. 4) The adoption of and community cooperation around soil conservation practices, agroecological methods and nature-based solutions like biological control, implemented to oppose the intensive, chemical-based and degenerative human to non-human relations within the greenhouse environment.

To analyse these local examples, I create a narrative based on the testimonies of workers through which I acquired knowledge about their multiple forms of resistance and critiques of the industrial structure during my stay on the field. My informants claimed not only a misrepresentation of their activities, but also an active effort by national and international institutions and media outlets to minimise and even invisibilise workers' struggles. As such, this research addresses workers' claims to make manifest their complex analyses of the relative autonomy and unsustainable environmental and labour systems they inhabit. The argument follows a particular political agenda, influenced by different local ideologies that seek a restructuring of the regional agricultural industry and a recognition of how patterns of segregation and oppression manifest at the lower echelons of the chain. It recognises existing inequalities as a direct responsibility of the intermediaries, distributors, supermarkets and consumers that comprise and consume from the regional production chain.

These claims are based on the geographically broad and historically deep "experience-near" approach outlined by Paul Farmer's applied anthropology framework, whereby factual and symbolic local forms of knowledge are combined and treated as central to the construction of a social theory (2010:31, 59). As such, this research includes an

extensive description of the arguments and feelings of the workers who directly participate in the production structure. Like Stuart Kirsch's work on pollution and dislocation in Papua New Guinea, my intention is to use "reserve anthropology" to examine how local workers' analysis of the social ecoenergetics of production reshape contemporary agro-industrial interactions with the state and the market (2006:3). I am particularly interested in the "recognition of indigenous critique and the articulation of political alternatives" outlined by Kirsch in his understanding of reverse anthropology (Ibid).

Methodology, informants and positionality

Research on western Almería's agriculture is not uncommon. Since the 1970s, scientific institutes, public institutions and local companies have been producing a range of biological and technological studies to assess the performance of regional agriculture. As such, farmers and warehouse labourers are accustomed to internal and external forms of quantitative data collection in their workspaces to measure plant growth, irrigation, output quantity, and vegetable acidity among other issues. In parallel, numerous social science studies have been carried out to assess labour conditions and the political economy structure of the agriculture industry. However, unlike with biological studies, local workers have not become accustomed to social science research techniques, nor the long-term assessment of their work from a social science perspective. This has been the case especially as the work of social scientists has been associated with the work of journalists, who have adopted extreme positions, either denouncing or praising the activities of the agricultural industry. Consequently, my informants expressed a common feeling of misrepresentation over the dramatic and simplistic portrayals of regional social problems in the news and on TV outlets. This understanding guided the methodological orientation of the research and the deployment of methods in the field, as the forms of past and future representation became central to the study, with the methodology being adapted to

prevent the participants' feelings of misrepresentation and to manifest alternative forms of workers' representation through different visual formats.

The research methods consisted of a combination of semi-structured filmed interviews, professional apprenticeship, participant observation and participatory ethnographic filmmaking. The different methods were used according to the availability and willingness to participate of each informant, as defined with the participant after recruitment. The recruitment process was also varied. Most scientists, input producers and commercialising house administrators were contacted via their company phone or email for the purpose of carrying out a filmed interview. In these cases, they organised a time slot when they would be available in their work environment to carry out the interview, so that I could film the company's activity and their statement in a brief tour. Only on a few occasions was I able to meet these informants a second time to carry out a follow-up interview or participant observation of their work activity. This was mostly due to lack of time or some suspicion about how I might portray the industry, despite the consent form that granted each participant the right to cease his or her participation and recover the filmed material we had shot together.

These individual interviews were used to obtain narratives, descriptions and comments; people's knowledge and practices. Acknowledging the broadness of the industry and the difficulty of understanding all its practices, from planting seeds to exporting the loaded trucks, semi-structured interviews were used to create a map of the different echelons of the industry, including the workers' opinions and descriptions of their activities within each sector. As Flick puts it: "Practices are only accessible through observation; interviews and narratives merely make the accounts of practices accessible" (1998:222). As such, the themes and topics discussed provided the key concepts to be explored in the ethnographic research. In other words, this research technique was used for idea generation (Fern, 1982), "as a source of insight" to define what to tell (Leech, 2002:665) and a means to understand people's "perceptions and experiences" (Blandford, 2013:23). They were also used to

determine the informant's position within the industry, creating a safe space that invited them to engage in self-disclosure.

As in Humberstone & Cutler-Riddick's research, the interview questions were approached "from a 'lived experience perspective'" (2015:8), whereby informants were not asked directly about the problems of the industry, but about how they feel in their professional careers and what they think about the lived experiences of others in the industry. Evoking local stories of workers' precarity, racism, price manipulation and forms of direct oppression gathered from low wage labourers, I discussed with participants their insider perspective, "soaking and poking" (Leech, 2002:665), while showing myself "slightly dim and agreeable" to avoid threatening the informants (McCracken, 1988:38). Throughout this process, special attention was paid to the frequent intervals of pause and clarification in the form of "ya sabes" (you know) and "um" for example, as well as the nonverbal cues that might bring to light the points of moral and social subtlety in their arguments (Lende & Lachiondo, 2009; Elizabeth, 2008). Filming the interviews was especially relevant for this purpose, as it allowed me to return to the footage to look for those moments of non-verbal expression, as well as highlight the different moments of irony, distress, pride and secrecy that arose with each informant. Semi-structured interviews were carried out with participants from the beginning of the fieldwork, first to gain acquaintance and where possible, to deepen the discussion of relevant subjects. Over the fieldwork period, 40 semi-structured interviews took place, with follow-up rounds carried out with 10 of the informants.

Other informants not associated with big companies, who work as farmers, seasonal labourers or packaging workers, were contacted more informally, by following the indications of bar customers, shop workers, friends or neighbours, after an often brief and informal presentation of the research. I approached these informants by phone first, indicating the person that had given me their number and expressing my interest in understanding their work in practice. Often this phone call was followed by an informal encounter at their greenhouse, or at a café if meeting at their workplace was

impossible or sensitive, as was the case for seasonal labourers and packaging workers.

If such encounters allowed for further meetings, with the informant's availability and motivation to participate in the research established, I conducted participant observation of their everyday activities and relationships. This classical form of anthropological research consisted of a prolonged immersion in the field site over a 12-month period from September 2017 to September 2018, accompanying 12 participants during their everyday activities at their homes, farms and in other places where they spend much of their time – the street, warehouses, greenhouses, bars, cafés and parks. This yielded data on participants' life stories, their knowledge and understanding, their descriptions, narratives and comments. During the research we created a routine of weekly encounters where I familiarised myself with their home routines, social relationships and outdoor activities, including walking, shopping, family relations, physical exercise and community engagement.

The research used participant observation as a way of identifying which parts of the story of family farming in the region had not been told. Attention was paid to the rules and norms normally taken for granted, “routine actions and social calculations that happen below the level of conscious thought and actions and thoughts that are not generally recognized as part of the “story”” (Guest et al. 2013:77). This was done with the objective of accessing “experiential worlds” (Vidich 1955:354), “interior experiences” (Irving 2011:25), “variations of selves” (Sharma et al. 2009:1648), as well as the discrepancies and “systematic distortions” made by the participants (Becker & Geer, 1957:31), although not without acknowledging the limitations of proof and the risk of making generalisations through this method, as Fine argues: “While the observations and the interpretations of those observations may be compelling, a reader can reasonably wonder whether any set of conclusions is definitive” (Fine, 2015:531). However, despite the existing limitations, as Bernard suggests, only through participant observation can one gain “intuitive understanding of what is going on in a culture” and “act like any other local person” in the field site,

accessing the more intangible meanings of living, growing and interacting with others (2017:283).

The process of participant observation was accompanied by semi-structured interviews, informal conversations and written field notes (see e.g., Kontos, 2004:832; Marcus, 1998; Desmond, 2014; Ingold, 2017). I also engaged in a period of apprenticeship on two of the farms where I was carrying out participant observation. These farms had opposing production models, one using a conventional intensive production model and the other an agroecological permaculture model. During this period from October to December, I learned the everyday dynamics of labour, experienced the effect of labour first hand through my body and engaged in closed interaction with the family members, neighbours, workers and agronomists associated with the farms. As Guest et al. argue when talking about participants' heterogeneous practices and ways of being: "We learn these things by doing them, and if you want to learn about them, there is often no substitute for doing them yourself" (Guest et al. 2013:81).

Moreover, in order to create an embodied description of the ethnographic encounters with the participants, the research used ethnographic film to highlight the sensory dimension of the participant's corporeal experiences at work. This film work was used as a source for video elicitation, to define the key research themes and as a testimony to, or approximation of, what embodying sustainability in the industry could look like (on filming embodiment and video elicitation see Pink, 2008; Sjöberg & D'Onofrio, 2020; Paterson & Glass, 2020). The outcome of the visual ethnography is a 35-minute ethnographic documentary focusing on the life of Antonia, Matías, one of the family farms participating in the study. The documentary seeks to provide a visual entry into the industry and into the embodied, locally defined forms of sustainable labour and agriculture.

I used collaborative filmmaking to explore the ongoing process of adaptation and transformation towards sustainable agriculture this family farm was engaged with.

Through the film process we did not only focus on the material facts that have made their transition possible, but on the life changes and contingencies triggering transformations in their agricultural production model, as well as in the social and existential needs. This included the filming their goodbye ritual as they left El Ejido's agricultural industry to start a new permaculture farm in the Alpujarras mountains. By focusing on the moment of departure and change, we wanted to show the different types of farmers they could have been, as well as the futures they seek to inhabit outside of the agricultural industry. By thinking collaboratively through the methodological and ethical challenges of representing how Antonia, Matías lived the process of change, we identified areas of mutual interest to bring out and make publicly observable, and hence filmable, the thoughts, emotions, memories and imaginaries of their search for a sustainable livelihood. They actively contributed to the research as subjects of their own existential inquiry rather than as objects of study. The documentary film process served as a practical, ethically empowering way of engaging Antonia and Matías in thinking through the representation of their lived experiences. The audiovisual medium served as a tool to generate shared ethnographic content and as a vehicle to engage in deep conversations with Antonia and Matías about the life-transforming events and social relations that have shaped their current vision of sustainability.

The use of film served to establish a context for the expression of transformational experience, challenging the values, assumptions and preconceptions, affecting how we perceive each other through the process of change. As Andrew Irving suggests, "the camera establishes a new awareness of and relationship between people, their bodies and their surroundings, in which thoughts, representations and understandings of life are brought into the public domain, enacted and reflected on for a recorded medium" (2018: 394). The engagement with the camera, creates a context for showing what matters to participants, while generating collaboratively designed visual content that serves to stimulate critical analysis of their modes of representation. When taken as a vehicle to engage participants, film can serve as a creative catalyst that generates speech, creative action and knowledge. A detailed description of the making the

documentary film that accompanies this research, titled *Esto Es Lo Que Hay*, is provided in chapter 3. The visual research also to the production of several protest videos that were featured on the local news, creating a counter narrative of the workers movement that had gone undocumented in the media up to that point and are discussed in chapter 2.

A desert transformed into intensive farming land

The Spanish National Colonisation Institute (NCI) was created in 1939 as an instrument of agrarian reform during Franco's regime. The institute aimed "to establish as many economically independent family estates as possible, to solve the social problems raised in the field" (Min. Agricultura, 1962:4). The NCI had a similar structure to the Tennessee Valley Authority (TVA) created in 1933 as part of Roosevelt's New Deal. It aimed to implement an integrated management plan for a social and regional development policy that would put an end to the serious problems of soil erosion and poverty caused by traditional farming techniques (Barrow, 2005:223). However, like the Soviet *agrorod* or Mussolini's *bonifica integrale* in Italy, Franco's NCI had strong social and institutional elements that envisioned an end to rural poverty under the regime's control (Mazzochi, 1951). The state gradually renounced the trust invested in private initiative and developed the plan with the Law of colonisation and distribution of the ownership of irrigated areas in April 1949 (BOE, 1962).

The 1949 Spanish law was influenced by the American Columbian Basin Project Act of 1943, which was witnessed by spokesman Ángel Martínez Borque, deputy director of the NCI, after a trip to the United States (Tordesillas, 2010:192). The 1939 Reclamation Project Act Law and the Columbia Basin Project Act in Washington decreed among other things that family units, plot sizes, the execution of works, the benefit and relationship between State and landowners, the 'reserve lands' and the 'lands in excess', would all be defined. This was considered useful as it indicated the

conditions required of the settlers within the NCI's strategic intentions, and led to the introduction of the administration-sponsored 'agricultural engineer', who supervised and provided technical support to farmers (Ibid.). Two years after the law was passed, the construction of El Ejido's agricultural infrastructure and town began. It is considered one of the NCI's most innovative projects and can be referred to as a product of strategic infrastructure, both in terms of planning and deployment of technology over time.



Photo 1: Design models, aerial photograph and main buildings of the first agricultural settlement of the National Colonisation Institute in *El Campo de Dalías*, 1958. The settlement was called Las Norias in reference to the water well, and is now a neighbourhood of El Ejido (Photo in Centellas Soler et al. 2009).

The NCI brought modern agriculture to El Ejido in the 1950s, first through sanding methods and later with greenhouse structures. It had a similar role to the Soviet and

Italian states in lending state assets – land, tools and technology – to poor peasants in order to develop the barren coastal land (Humphrey, 2005). However, the initiatives of the NCI in the region were not only aimed at developing new agricultural techniques, they also aimed at enforcing post civil war ideological depuration. With the intention of breaking up conflictive areas of republican resistance, like the Mountain region of the Alpujarras, the NCI created attractive development incentives in nearby regions, including El Ejido, where communities of scattered emigrant families worked under the direct control of the institute.

The development phase of the agro-city, from 1956 to 1982, was characterised by a social spirit and accompanied by a strong local administration and institutions controlling the city's development. The second phase, from 1982 to 1991, is characterised by El Ejido's establishment as a global production network, marked by Spain's entry to the European Common Market in 1986. This period is notable for the high level of experimentation with new fertilizers and pesticides with severe chronic health problems for farmers, pollution and drainage of aquifers, and high influx of immigrant to supply the extra low skilled labour farmers needed to meet increased demand.

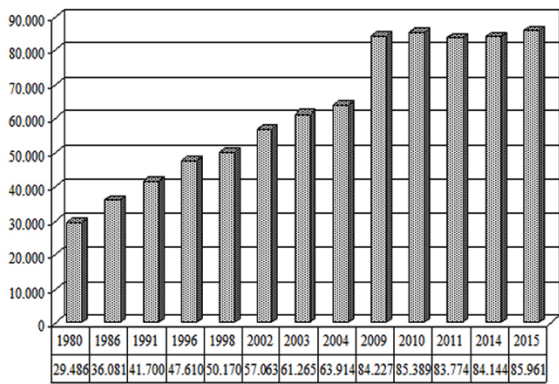
The third phase (1991-2011), referred to as aggressive industrialisation, is characterised by its economic orientation in response to market competition. This was the period with highest number of technical innovations in agriculture, higher number of building licenses offered and companies registered. It is also the period of highest corruption, extreme right policies and opacity in the local public administration and institutions, encompassing substantial labour budget cuts, increasing levels of precarity and exploitation across the chain and higher numbers of migrant workers. The lack of planning and infrastructural investment towards the migrant community since their arrival, led to the creation of shantytowns. This demarked the migrant community, which together with an anti-immigration media campaign pushed by the local administration, coincided with an increase in racist groups and ethnic violence (Checa 2001:13; SOS Racismo 2001:11; Calvo Buenzas

2000:49; Río Ruiz 2002:84).

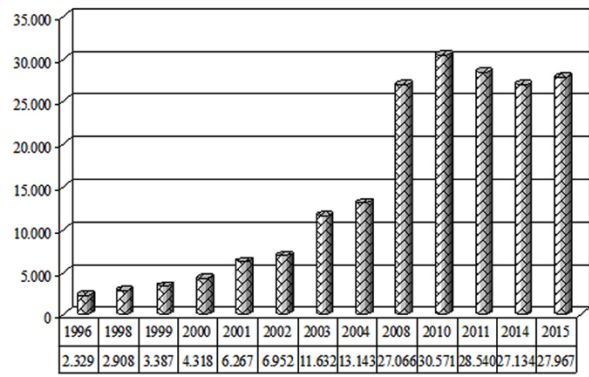
Finally, the fourth phase, referred to as the period of stability and growth (2011 to present), is characterised by an infrastructural reorientation towards sustainable production. Although levels of corruption remain high, there is an increased tendency towards reduced waste, sustainable agricultural methods, as well as some efforts to decrease labour exploitation of migrant workers. The following images and table unpack the four development phases, exploring the different aspects of agricultural intensification in El Ejido.



SATELITE VIEW OF EL EJIDO
© PHOTOS IN NEWS



INCREASE OF RESIDENTS IN EL EJIDO SINCE 1980
(ENTRENA-DURÁN & JIMÉNEZ-DÍAZ 2000)



INCREASE OF IMMIGRANTS IN EL EJIDO SINCE 1980
(ENTRENA-DURÁN & JIMÉNEZ-DÍAZ 2000)

GOATS EATING DUMPED VEGETABLES
© JULIAN ROJAS



IMMIGRANT SHANTY TOWNS
© REVELADOS DE ALMERIA



FUMIGATION ON THE FIELDS
© COEXAL

SOILLESS CULTIVATION
© COEXAL

EL PAIS

El subleigado del Gobierno fue golpeado en el funeral de la mujer asesinada por un inmigrante
Cientos de vecinos de El Ejido atacan a los inmigrantes y destroran sus locales

¿Háder gobernar investigar a los líderes "traidores" que alientan la protesta exterior?

DÍA DO INDEPENDENTE DE LA MAÑANA

LAJIDA 1 DE FEBRERO DE 2000

El subleigado del Gobierno fue golpeado en el funeral de la mujer asesinada por un inmigrante. Cientos de vecinos de El Ejido atacan a los inmigrantes y destroran sus locales. ¿Háder gobernar investigar a los líderes "traidores" que alientan la protesta exterior?

CLIPPING OF 2000 RACIST RIOTS

Table 1: Phases of agricultural development in Western Almería

	Phase 1 (1950-1982) Development	Phase 2 (1982-1991) Integration in the international market	1-2011) Industrialization	Phase 4 (2011-present) Stability and growth
Population*	1980 - 29.486	1991 - 41.700	2011 - 83.774	2015 - 85.961
Level of agricultural intensification**	1956 - Grape fields in the mountains and small subsistence crops in the coast 1975 - 3.000 hec. of greenhouses	Gradual increase of greenhouses and turn to horticulture production	2009 - 8.194 hec. of horticulture greenhouses	More than 32.000 hec. of horticulture greenhouses
Technological development***	NCI introduced: 1950 - water wells 1953 - plots of 3.5 hec. to low-income family units 1956 - sanding methods Input companies introduced: 1963 - greenhouse technology 1977 - Drip irrigation system 1980 - Hybrid seeds	1982 - Chemical pest control 1984 - Thermic plastic 1986 - Pipes with integrated drip system 1990 Desalination plant, water reservoir and start of reutilization techniques 1990 - Soil-less plantations 1991 - Pollinizing bees (Lavandera and Checa, 1981).	1992 - New seed varieties 1997 - Biological pest control 1999 - Automatic irrigation system 2000 - Automatic climate control system 2001 - Change to less productive species like Daniela and Cherry tomatoes and preventive measures 2007 - Integrated pest control	Acclimatisation and energy efficiency. Emergence of circular economy and biodiversity islands. Growth and expansion of agricultural apps for price monitoring and technical advice. Use of sensors and agricultural robots in nursery houses. Use of biotechnology and engineering for insect and seed modification.
Labour composition	Small farmers Low-income family units Migrants from the Alpujarras Mountains in Northern Almeria. NCI technical and administrative workers.	1 st generation of settlers - producers 2 nd generation of settlers - technical workers and specialised jobs (sale agents, chemists, ag. engineers, packaging workers, greenhouse builders and drivers) Emergence of plastic producers and engineers Emergence of low wage labour offer for low skilled immigrant	12.000 immigrants per year from Morocco and West Africa employed as day labourers, mainly men (Martínez Veiga 2001:83). 3.000 producers. Average of 1 technician for every 12 producers Increase in specialised greenhouse service providers (energy, seed and soil providers, technological assistance and consultancy) 2008 - steady increase in unemployment	New population of immigrant workers from Eastern Europe for packaging work, mainly women. Increase in large infrastructure projects work demand, especially in relation to energy projects Steady increase of specialised labour. Decrease of immigrant workers after the crisis and steady increase since 2014.
Labour Conditions	Hard due to strong wind and arid land. Collective and cooperative under a family growth spirit, reliant on the tornapeon system (exchange of labour between families during harvest) with high levels of self-exploitation. Women's work largely conceived	Reduced exposure to climate due to greenhouse structures Increased rate of toxicity due to use of chemicals Increased pressure on family units to increase production due to rise in market demand and need to adapt to technology Productive units started hiring immigrant labourers	Organized system whereby low skill immigrants were hired without contract for short periods jumbling around productive units, doing heavy tasks and long shifts for a revenue of 3 Euros the hour. This created 'intensive' and 'extensive' exploitation (Martínez Veiga 2001:92). Intensive, mechanic labour, paid below minimum wage with	Labour exploitation of immigrants continues although regularisation has increased and they have more option for social support. Subcontracting and outsourcing have become common practices. Unions and cooperatives have lost political strength and workers' support. Production work is

	as help.	informally.	temporary contracts also became dominant in the packaging companies.	increasingly mechanised and digitalised
Social cohesion	Strong cohesion as the families shared a common traditional agricultural knowledge, as well as, a post-war migrant identity, and common yearning for a better future for their families. Commercialisation in <i>Alhóndigas</i> , the producers would bring the produce and sell it through a Dutch auction with fixed price	Process of 'encapsulation' of producers as the state cut subsidy support. This led to the strong cohesion and isolation of producers contributing to later segregation of newcomers (García 2002). Associative spirit: development of unions and cooperatives Immigrant community started occupying empty <i>cortijos</i> (farmhouses).	Segregation of the migrant communities in <i>chabolas</i> (shanty towns) built around the greenhouses (Roquero 1996). Increased xenophobia by local population this led to the 3-day street riot in February 2000 by racist local groups in opposition to the immigrant workers. Commercialisation in production markets (origin) or retail sales (to consumers).	Improved social cohesion between immigrants and local as with a decrease in explicit violence and confrontation although these still take place in a private manner. Stronger cooperation between producers, technical supervisors and ecological groups to improve soil erosion, filtrations and water consumption. Overall discursive turn towards modes of sustainable production (Garrido 2016).
Political scenario	NCI became the ruling authority in the colonial settlements, enforcing ideological depuration through a social development spirit (Tordesillas 2010:185) In 1975 the social spirit of the NCI was highly criticized by the World Bank and turned into and economic growth spirit (Ibid.).	First democratic administration in El Ejido led by Major Juan Callejón from PSOE (Socialist Party). 117/1984 decree of the Junta de Andalucía suspended all subsidies and state credits to producers due to the severe exploitation of aquifers (Martínez Veiga 2001:26). 1986 Spain joined Europe's Common Market	Rise of xenophobic discourse, speculation and extreme right populism through the rule of Major Juan Antonio Enciso Ruiz from PP (Right Wing Party) and later from his self-built party Partido de Almería. 1996 EU and Morocco trade treaty, leading increasing ethnic tensions and market pressure. Law 8/2000 denies the right to association and the right to work for irregular workers (Martínez Veiga 2001:26).	Francisco Góngora, previously the urbanism councilman during Enciso's term, becomes the mayor of El Ejido, ruling for the past two years in coalition with VOX and with the socialist party PSOE since February 2021, after VOX broke the governability agreement. Increased mistrust toward unions, especially the Andalusian Workers Union (SAT).
Corruption	No data	Callejón and the city councilman Balaguer (closely linked with the research institute Cajamar) made 56 fraudulent contracts with the Provincial Council of Almeria, backed by a political pact between PP and PSOE. The subcontracting company Policlínica del Poniente SL led by Callejón and part of the fraud case 'Tela de Araña' of the PSOE in Almeria produced 50 fraudulent contracts.	In 2009 Juan Antonio Enciso was accused of leading a fraudulent network that stole 150 million from public treasury (Tena, 2010). For 20 years, over 65 political representatives from El Ejido obtained large benefits contracting works and services through the subcontracting company 'Elsur'. Enciso was arrested in 2009 and released on a 300 thousand Euros bail in 2010.	Francisco Góngora, was accused of the same corruptive practices of his predecessor using 'Elsur' to get commissions through subcontracts in urban construction (López 2014). But he was absolved with 74 thousand Euro fine in 2021. In 2014 the union SAT was accused of money embezzlement and declaring fake formation courses, this has not been proven.

Relation to migration	Welcoming and integration oriented as most settlers where migrant families (Tordesillas 2010).	Unequal relation to immigrants although with some social cohesion (Martínez Veiga, 1999b)	Drastic increase in immigrant population, exploitative modes of production and xenophobic discourses (Martínez Veiga 2006). After the February 2000 three-day racist riot businessmen and the local administration advocated against the Pimentel Law, preventing migrants from voting at the municipal level. Agricultural associations (ASAJA and UAGA) started to search strategically foreign workers who did not come from the Maghreb area. Leading more than 3000 Moroccan immigrants leaving El Ejido in 2000 after the violent February riots.	Between 2010-2014 more than 25.000 people were given deportation notices in Spain, taking the European lead in immigrant expulsion (INE 2011). Poor economic conditions, negative migration discourse in the political and media agendas, segregation and precarity, continue to create xenophobic environments, but now discriminatory practices and aggressions take place at an individual level, not reaching the wider public and audiences (Checa, Garrido and Olmos 2010:129).
Health and environmental risks	Low potability of water. Harsh meteorological conditions.	High risks due to pesticides with cases of chronic illnesses and death by chemical exposure. Insect mutations, aerosol emissions chemical filtration and aquifer pollution from fertilisers. Soil erosion and pollution. Water scarcity	Salinization of areas close to the sea and decrease of the piezometric level. A non-disclosed report dated year 98/99, documented the risk of high accumulation of pesticides and fertilizers, producing chronic respiratory and skin diseases that affected young and old alike, with a high rate of workers having to leave the labour market altogether due to their illness. (Castaño Madroñal 2002).	Demand for recognition of work-related conditions among packaging workers and labourers. Increased modification and mutation of insects, with increased resistances. Natural gas carbon fertilization to increase plant productivity can produce risk of respiratory illness (Fernández 2017; Horrigan et al. 2002).

Data has been gathered from * Entrena-Durán, and Jiménez-Díaz (2016), Ruiz (1999), Río Ruiz (2002) Jiménez-Díaz (2005), Instituto de Estadística de Andalucía (IEA) y Ayuntamiento de El Ejido. ** Censo Agrario de España. (2009). *** Cajamar (2006). All other data: (Martínez Veiga, 1999a, 2001, 2006; Olivares and Rodríguez, 1983; M. Agricultura, 1962; Jiménez-Díaz 2010; García Castaño and Granados 1998; Checa 1995; Checa Olmos and Arjona Garrido 2001; Checa and Frenández Soto 2001).

Types of family farms

There are different types of farms in the region that have developed as the agricultural model progressed. Most practice intensive agriculture, consider themselves small scale farmers, with an average of two hectares of land and are generally related to the original family unit working the plot of land. The first two types of family farms, those selling to cooperatives and *alhóndigas*, emerged as these companies started appearing

in late 60s in the region. Test-run farms emerged in the 90s as seed companies started taking advantage of the concentration of greenhouses, to move their headquarters to the region and test their varieties. Agroecological farms emerged in early 2000s as a counter appropriation of the productive space by politically engaged farmers who define themselves as peasants. The majority of farmers access land through inheritance from long term farmers in the region, or from rural labourers who in the 80s and 90s bought a plot of land. There is a portion of these that rent the land and hire it for periods of time, or who sell it, allowing for a degree of land transfer, including to migrant farmers. There are also a few well-off family farms acquire land and build new greenhouses with the profits of the greenhouse units they already have. While the average farmer has two hectares, the larger farms can have up to 300-400 hectares.

The different types of family farms have developed diverse relations of production according to their level of capital accumulation, their associations and their financial situation. Family farms who are members of a cooperative or a SAT tend to have both the financial support to buy inputs (greenhouse structures, seeds, insects and fertilizers) and the production advice of the cooperative agronomists. This is not the case for family farmers selling to *alhóndigas* (auction centres where produce is commercialised), who must seek independent production inputs and advice. Although those who join cooperatives, are subject to price contracts signed between the farmers and cooperative, which can entail lower prices than set by the market, the cooperative model is seen as assuring the family's long-term financial stability. This stability is accompanied by the professionalization of the farm as a business and the farmer as a businessperson, and the concomitant distantiation of other family members from the productive unit. This has allowed the children of these families to pursue other careers, including being employed in the chain in better off and more influential positions, such as agronomists, biologists, engineers and business managers. Cooperatives also tend to create a monitoring environment for farmers, led by the cooperative agronomists, who determine and manage the use of specific production techniques, like biological control, which requires careful observation and

modification of the insect populations. This is not to say all cooperatives use biological control, but those that do are more likely to engage all its members in the production technique and to monitor its correct implementation.

Alternatively, when family farms sell directly to *alhóndigas* they tend to check the prices of each *alhóndiga* and sell wherever they get a better price in any given moment. This gives them an apparent freedom but can also hamper them in times of low prices, which can be below production costs when there is an accumulation of produce. Also, the *alhóndigas* do not grant farmers access to agronomists' advice or financial help with greenhouse renovations and production inputs. Farmers selling to *alhóndigas* need to seek these services independently and often delay asking for help until their production is at risk. This makes their crops more vulnerable and can lead to farmers switching from biological control to the use of pesticides. The various risks and the lack of support from the *alhóndigas* often leads a portion of the family members, predominantly the women of this kind of farms, to take alternative jobs in the industry, often in low skilled positions in the packaging centres or as labourers for other farms. Young farmers can request subsidies up to 90000 Euros to start their business, however only 232 farmers in Almería received help in 2021, making a combined total of 13 million. Also, temporary labourers have access to the agriculture unemployment subsidy of less than 500 Euros for 6 months. Given the low number of young farmers benefiting from the subsidies and the low unemployment benefits for labourers, subsidies have a marginal influence in the economy of family farms and are not generally considered a viable option to attain financial stability.

This is not to say there are not well-off farmers selling to the *alhóndigas*, or farmers that struggle in cooperatives. But the focus of cooperatives on niche varieties, integrated pest management and ecological production, makes it more likely that those family farms who are members of cooperatives engage with those production techniques. The focus of *alhóndigas* on volume, classification and stock, makes farmers selling there to concentrate on the number of kilos and appearance of the produce they bring as that will determine how the *alhóndiga* classifies the produce (1st, 2nd and

3rd class) and its price. The focus on lowering production costs also leads family farms selling to *alhóndigas* to engage in high levels of self-exploitation and the exploitation of migrant labourers working seasonally at the farms. While those selling at cooperatives, tend to have fixed workers with precarious temporary contracts for the season, those selling to *alhóndigas*, especially those in a situation of vulnerability, tend to hire migrants (often undocumented) on a daily basis and often without contracts.

Sometimes, farmers with select varieties can negotiate special packaging with *alhóndigas* to help their produce achieve higher sales. Others have a small warehouse in their farm where they package the produce on their own to market to the *alhóndiga* and specific buyers. Despite, the better economic returns, the working conditions in these individual warehouses is considered the most exploitative by packaging workers in the region due to the rhythm imposed by farmers. This is also consistent with those farmers seeking to become middle size and large-scale farmers, who tend to acquire more land, expanding and intensifying production while maintaining precarious working conditions for workers. The farm BioSabor, with 300 hectares and its own branded packaging, is an example of this dual practice of professionalization and expansion by exploiting workers and cutting labour costs, a practice against which the Andalusian Workers Union have recently taken legal action in the past years.

Other family farms produce directly for seed companies, serving as test-run farms for commercial trials. In this case they follow strict protocols set and monitored by the seed companies, but the farmers tend to receive in exchange contracts above the standard. Depending on the rigidity of the seed companies', farmers are sometimes also obliged to comply with ecological production standards and social sustainability protocols by offering formal contracts to their labourers. There are also family farms that when confronting extreme vulnerability have chosen to practice non-intensive agriculture for their own sustenance, including some that have engaged in agroecological practices, biodynamic agriculture and permaculture. These are no more than five farms in the region, but collectively they have managed to build a consumers' association to whom they sell their produce directly. These farmers cannot sell in the

commercial market, as they do not have seed traceability certificates, yet they are finding their way in the province with the consolidation of Almería's Agroecological Network. These families tend to diversify their employment until they are ready to live of agroecology and tend to depend on the family's labour rather than hiring workers.

Current tensions and the political relevance of western Almería's agro-industrial cluster

Auxiliary industries have used the cluster as a means to experiment with new varieties¹ and to propagate the use of existing chemical and mechanical technology. The German pharmaceutical giant, Bayer, recently acquired Monsanto (USA) along with its seed brand Seminis, and merged with BASF (Germany), to whom Bayer transferred their original seed brand, Nunhems, creating a semi-monopoly of seeds and inputs. Due to the concentration of productive activities in a single location, western Almería is a perfect testing ground for these agro-giants. They benefit from observing which products work well when put to use, and take large sums from the local sale of seeds and products to farmers, all while making significant savings in transport and product promotion. Companies develop inputs abroad and test them on site with Almería farmers. They profit from the needs and infrastructure capacity of family farms, while creating dependence on their products in the local community. As Pérez Mesa argues, "these subsectors use the province as a mere buyer, being prone to relocation in the case of decline of the producer-marketer sector" (2009:171).

Politically, these companies have been welcomed, as they assure a net inflow of foreign capital investment while leading the technological push required for the cluster to assert its place in the European market. Their social acceptance has been mediated through institutions that represent the industrial cluster: the Association of Organisations of Fruit and Vegetable Producers of Almería (COEXPHAL), the

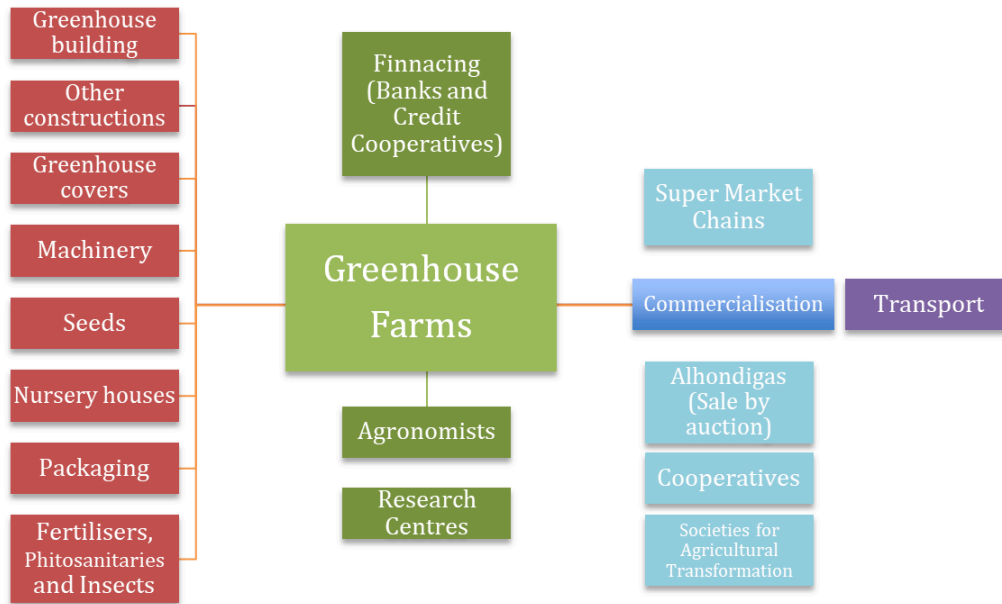
¹ This takes place through highly secretive studies, where tests of a single variety are numbered differently in different greenhouses so that company labourers and the farmers hosting the studies can't exchange information on the new varieties.

Association of Producers of Almería (ECOHAL), and the Foundation for Auxiliary Technologies of Agriculture (TECNOVA)². These have worked for the unification of production according to European standards, advocating for the centralisation of producers and commercialising companies, and taken the first steps towards project partnerships between the auxiliary industries and commercialising firm, in order to develop geographically adapted products.

For instance, the local brand Sandía Fashion, a seedless watermelon with an extensive market share, is a private partnership between Nunhems (BASF) and 17 production companies who have exclusive production rights. Numerous farmers' associations have denounced the brand for importing and rebranding Moroccan watermelons as Spanish, but these claims have been silenced by the corporate structure. As such, while the industrial private companies and institutions are responsible for the vast local production and its progress, they also protect each other in their parallel business ventures, even if occasionally these undermine repackaging laws, or the rights of local farmers and labourers. Diagram one describes the multitude of actors that surround and impact greenhouse production and its distribution.

² Coexphal, created in 1977, represents 70% of Almería's production, with more than 110 companies. Ecohal was founded in 1986 and represents 6 auction houses, which account for 20% of production. Tecnova was constituted in 2001 and brings together 116 companies providing services to agriculture.

Diagram 1: Structure of Almería's agro-industrial cluster



Source: Author's illustration



Photo 2: Farmers in protest close roads using their tractors (Photo by Ana Escobar, EFE, published in El País, Feb 14th, 2020)

Echoing the grassroots protests against rising fuel prices led by the 'yellow vest' movement across France in 2019, there was a turbulent start to 2020 in Spain, with daily protests across the country by farmers fighting against the low wages paid them by distributors at production sites. Under the motto "Farmers to the Limit" (*#AgricultoresALímite*), thousands of tractors cut across highways protesting the profitability crisis and its effects. According to Luis Planas, the Spanish Agriculture Minister, farmers receive 20-30% of the price that consumers pay at the store. Between 20 to 50% of the sale stays with the distributor, and the store or supermarket keeps between 20 to 60%. This varies from one type of vegetable to the next, according to negotiations between distribution centres across Europe. Farmers can keep track of the variability through price apps and stock exchange bulletins, but they can't influence the price, which many times has forced them to sell at a loss; an illegal practice that has become common in the agricultural chain, essentially a sale made below the cost price of the product at the time of production.

With an overall decrease in price since 2008 in most vegetable varieties, aggravated by Russian and US custom duties and the illegal repackaging of Moroccan produce as Spanish in Almería, farmers struggle as their financial survival is yearly put into question. In addition to the profitability crisis and unfair competition with foreign countries, farmers have been affected by the increase in severe natural events. Storms, tornados, floods, heavy hail, drought and soil erosion have put many crops at risks, leading to the complete loss of harvest and infrastructure of many farms. This has been especially detrimental to smallholders who often cannot afford production insurances and lose everything. These problems have sparked protests for the past ten years, but never with the level of negative media reaction which occurred at the national level at the beginning of 2020. However, the issue was rapidly forgotten as the world suffered the COVID crisis and farmers were forced to continue working under the same precarious conditions they had protested against.

In this competitive agricultural context, the extreme right Spanish political party, Vox, has used the invisibility of such local views on the farmers' profitability crisis as political capital to gain popularity across rural Spain. Targeting the farmers' desperation over the lack of public attention, Vox emerged in rural regions like Almería and Murcia in 2018. It became the political party that could bring representation to the fields, addressing, through their motto "Spain first", the forgotten Spanish farmers, the problem of repackaged foreign products and the price crisis. In 2019, after decades of right wing Popular party (PP) rule, El Ejido became the first municipality in Spain with a coalition between PP and Vox, lasting only for a year due to breaches on the gobernability agreement by Vox. The party appealed to the racist discourses that dominate the region, heightening ethnic conflicts such as the violent riots of 2000 where autochthonous farmers targeted migrant labourers. As the son of a local farmer who died in the 2000 riots, the local Vox representative has used the same rhetoric of conflictive migration and segregation as was used at the turn of the century, but he also had disagreements with Vox and left his role and the party in July 2021.

A high number of documented and undocumented migrants who come to the region to engage in agricultural labour continue to live in improvised settlements without water or sanitation. Regardless of their vital importance in the fields, the normalisation of racist attitudes and a lack of infrastructure and policies to integrate incoming workers over the years have reinforced ethnic marginalisation and discrimination. In some cases this has generated living conditions that, according to Professor Philip Alston, the United Nations Special Rapporteur on extreme poverty and human rights, "rival the worst I have seen anywhere in the world" (OHCHR, 2020:20). Adding to these issues, Vox also revived the Franquist ideology that founded El Ejido in the '50s, when the dictatorship's National Colonisation Institute (NCI) leased land only to those with a letter of good behaviour from their home villages. The ideological depuration initiated by the NCI is brought to light through the political tendency towards conservative politics in the region, as well as the xenophobic reaction to newcomers in the absence of social policies that provide

adequate working and living conditions for migrants. Yet, intensive agriculture across the region has depended on migrant labour since 1986, when Spain entered the European Union, rendering the rising xenophobia and continued absence of social policies in extreme right discourse chronically incompatible with the social sustainability and productive capacity of the commodity chain, as will be unpacked in chapter 2.

Anthropologist Ubaldo Martínez Veiga refers to four factors maintaining segregation in El Ejido. The first concerns the background of ideological conformity to Franco's fascist ideology demanded by the Spanish NCI. The second concerns the proliferation of banks, regulatory agencies and institutions that accompanied the development of the agricultural industry (Amin and Thrift, 1992:580). The third factor concerns the 1984 suspension of subsidies and state credits to farmers due to severe exploitation of aquifers. These financial cuts led farmers to unite through a process of "encapsulation" as a means to create regional wealth, heightening their suspicion of any external help (Rodríguez García, 1999). Finally, as a fourth factor, local farmers and institutions developed the myth that immigrants are taking locals' jobs. In El Ejido, there have been peaks of 12,000 immigrant workers at a singular moment, though estimates reveal a need for 15,000 immigrants to meet producers' demands (Guzmán & Guzmán, 2015). Production data discloses that El Ejido is actually lacking in immigrant workers. However, the rotation of day labourers between farms produces a detachment between the thousands of migrant workers and individual farms, forcing migrant workers to appear available, thankful and accepting of being interchangeable, making their labour seem "redundant and replaceable, an accident of the economy" (Martínez Veiga, 2001:88).

The process of segregation can also be seen from an institutional and regulatory perspective. The input company lobby in Brussels that sets the rules of food security, along with the continued budget-cutting and centralisation guidelines of the Common Agricultural Policy (CAP), put farmers under financial and environmental pressures to the detriment of their social conditions. These conditions are reproduced in their

treatment of low-skilled workers lower down the chain. In order to preserve agricultural liberalisation, individual countries are forbidden from setting a minimum price on vegetable produce, strangling workers at production sites. The inaction of agricultural inter-professional associations, unions and both progressive and conservative political parties regarding the defence and advocacy of just labour and conditions in the fields and fair prices at origin, is a pervasive burden. These failures have been actively denounced in Almería by numerous independent agricultural associations like the 'Colour Gloves Association' in defence of packaging workers, the 'Andalusian Workers Union', in defence of migrant labourers, or the recently created in 'Agriculture Alive and in Action' in defence of family farmers, yet the commodity chain continues to function unchanged.

Given the complexity and variety of factors affecting the social, environmental and economic sustainability of the commodity chain, the objective of this research is to understand how sustainability is subject to continual transformation by the communities that make production possible. This implies reflecting on workers as "an oppressed class prohibited from actively creating the geographies of capitalism" (Lier, 2007:821), but also as a diverse and dynamic social group that negotiates the "strategies that shift the capitalist status quo" in their favour (Coe & Jordhus-Lier, 2010:8). Workers simultaneously embody labour precarity and labour agency as they make the micro-level decisions that transform productive forces. This analytical orientation recognises agricultural workers as "sentient social beings who both intentionally and unintentionally produce economic geographies through their actions" (Carswell & de Neve, 2013:63), and involves analysing how workers transform productive forces like the technology or infrastructure that enable production (Lund-Thomsen, 2013:72), while being socially and financially constrained by the terms of production within the industry (Herod, 2001:15).

Outline of the work

Chapter 1 - The forming Industrial Taste in the Family Agriculture Model of the Spanish Plastic

Chapter 1 redresses the gap in knowledge regarding non-scalable values of family farming. It reconstructs the problems of scalability in the regional intensive agriculture system and explores how its sustenance through time has been made possible by the non-scalable aspects of the family unit. 'El legado campesino' (peasant heritage), in terms of cooperativism, conscious adoption of technology and intricate connection to nature, helps families cope with the everyday pressures of being agrobusiness managers. I argue that farmers defend family farming for its endogenous characteristics, which remind them that their agricultural project is not only subject to price volatility, nor simply a product of the industry's commercial image strategies, rather it is the refuge of a vernacular understanding of the land and of communal life. Yet, the bureaucracy behind food security and the push towards intensification and professionalisation have defined a system of exclusion wherein families either comply with labour requirements, financial pressures and rigid international trade regulations or go out of business.

Chapter 2 - 'Es lo que hay': Public secrets and normalised inequalities in workers' everyday lives

An account of workers' everyday forms of survival, subtle resistances and their effects on the industrial labour structure make up the core of Chapter 2. It examines how workers experience the coercion and oppression that are the subject of public secrets in the industry, and how they try to challenge these secrets. Public secrets are defined, following Taussig (1999), as generally known facts that cannot be easily articulated. The pressure to maintain a place in the market and add value to produce leads companies to actively hide internal injustices and workers' mobilisations. Getting paid at a rate below the minimum wage, having to pay for your own welfare, or being publicly shamed and discriminated on the grounds of ethnicity and gender, are the

unspoken norms of the industry for many workers, and they are not openly discussed by most farmers, workers and especially commercialising companies. I argue the lack of collective mobilisation isolates and marginalises the few attempts at legal action made to address normalised forms of oppression within the industry.

Chapter 3 - It Is What It Is: Visualizing sustainability collaboratively in Western Almería

Chapter 3 deals with the politics of representation in the western Almería industrial production chain and the process of making a participatory film with local workers, showing how the industry is viewed from within. The chapter argues that anthropologists have a duty to visualise locally emerging sustainability strategies that take into account women, migrants and knowledge of nature, thereby showcasing alternatives to an industrial model that surpasses the local ecology's generative capacity. The analysis is brought forward through the experimental process of making a participatory ethnographic film with the members of one family-run permaculture farm, who grow in El Ejido and sell their produce directly to consumers. The film explores the achievements and tensions that drive the family unit, particularly the women, in and out of the productive structure, as well as the adaptations they make to sustain life.

Chapter 4 - Natures in tension in western Almería's agro-industrial adoption of biological control: Inclusion barriers, local knowledge and the conservation approach

The lack of attention of local scientists to the social and economic problems that affect farmers' implementation of biological control marginalises local knowledge, while making more difficult the scalability of biological control by conservation and the expansion of local emerging sustainability strategies. Firstly, the chapter shows how temporal constraints, increasing economic risks and the practical difficulties of managing biological control experienced by farmers have led to a drop in the adoption of biological control and to a discrediting of scientific advice over community

knowledge. Secondly, the chapter studies the few regional farms using agroecological practices that reaffirm a relationship of mutual dependency between nature-based solutions, production and sustainable agriculture. The empirical experience of this rare kind of farmer demonstrates how interspecies relations can be renegotiated in the greenhouse, from the current forms of industrial domestication to a balanced collaboration between man and nature that generates respect for natural cycles.

Chapter 1

The forming Industrial Taste in the Family Agriculture Model of the Spanish Plastic



Photo 3: View of El Ejido and its plastic sea from the Sierra Gador (Photo by the author, February 2018)

Introduction

The white plastic sea stretches far into the horizon, a myriad of greenhouses separated by a labyrinth of alleyways. The shapes vary, most are trapezoids, but no two look the same. Sitting atop the Gador mountain, looking down and across the vast *Campo de Dalías* in Western Almería, I wondered if the shapes were related to the morphology of the terrain, or a product of creative urban planning. Before starting fieldwork, I had imagined I would be looking down and clearly identifying the

patterns and rhythms of industrial agriculture. Instead, the landscape reminded me of futuristic films, maybe a kind of plastic-protected colony on an outer planet. Tellingly, the greenhouses in the opening scene of *Blade Runner 2049* (2017) are from El Ejido. Staring at the landscape before me, I said out loud, “This could be Mars in the future”. The local friends who had accompanied me up the hill burst into laughter. Sitting right next to me, Irene, put her arm around my back and pointed to a group of greenhouses,

Can’t you tell? Look at those three greenhouses. Can you see how the roads around them make it part of the same structure, but yet there are three different greenhouses inside? That’s a family. I would say they are one father and two sons, who are not really on good terms. Do you see the greenhouse that looks worse off than the rest? That’s probably because one of the sons does not get along with his father and brother.

I stared back at Irene thinking that she was making it all up. Where I was seeing futuristic scenes, Irene was seeing agricultural families and their histories. I had been meaning to research how the concentration of companies in a single location had led to the creation of economies of scale, the expansion and specialisation of the different industry branches, making produce cheaper as more was being produced. Irene made me turn the question around. Her comment made me realise the little attention given to non-scalable factors of the intensive agriculture complex, especially those concerning family farming, the centrepiece of regional agriculture. Following Anna Tsing, non-scalability theory tracks the design problems of scalability by searching for non-scalable factors, which she defines as “everything that is without that feature, whether good or bad” (2012:509). When looking at plantations, she suggests they emerged through a process of historical contingencies and conjunctures rather than a premeditated design. A combination of unexpected factors led to their emergence as a scalable model to obtain agricultural profit, yet as with any new enterprise, it was incomplete. She suggests that “attention to their stumbling — that is, the contingencies and conjunctures that informed their design — is the “nonscalable” approach, one which I take so as to see where their plans failed to meet their own

expectations” (Ibid: 510). Borrowing from Tsing’s notions of non-scalability theory, I started questioning how the scalability of western Almería’s agricultural industry had affected, failed and reshaped the taste and value of food production of the autochthonous family farming, pointing to non-scalable modes of production as resistances to industrial scalability within the ‘modelo familiar’ (regional family farming model).

In response, this chapter argues that the industrialisation process and its economic structure have come about at the cost of some non-scalable factors of family farming, including technology adoption, familiar associationism and the close relation between farmers and the natural world. This loss of endogenous non-scalable factors has created a scenario that is neither socially nor environmentally sustainable for family farming, with younger generations increasingly distancing themselves from the family unit, as the model’s ‘familial’ nature opposes the industrial business structure. This chapter contests the current corporate positivist approach to the sustainability of Almería’s family farming model, as it fails to address the effects of existing industrial, social, moral and economic inequalities forced on the family unit. It uses extended testimonies to illustrate the agency of local farmers and labourers, showing the distinct ways in which they theorise about their own moral perspectives. The chapter also defines key themes in their understanding of social change. The objective is to understand the moral negotiations and relationships that tie together the farm, the family and the industrial complex, not just in terms of the scalability of economic and productive exchanges, but also in terms of non-scalable factors, including workers’ behaviour, care and affect.

Small family farms in western Almería and the anthropology of agriculture

This section explores how the notion of family farming has evolved in western Almería through the process of agricultural intensification. The first subsection gives an overview of the current debates on family farming within the agricultural industry,

exploring the features of family farming that the industry uses to reinforce its image of sustainability while maintaining low labour costs. The second subsection explores the literature on the anthropology of family farming from the perspective of peasant studies, establishing key debates on class differentiation of the peasant household and key concepts such as petty commodity production. The third subsection explores the relevance of peasant studies debates for the history of family farming in western Almería, exploring how critical regional scholars have analysed family farms and their modes of reproduction.

Situating family farming in western Almería's industrial agriculture model

Western Almería has a total annual production of 3.5 million tons of fruit and vegetables cultivated over 45,179 hectares of plastic greenhouses. 15,000 family farms account for the bulk of production, with an average holding of 2 to 2.4 hectares of land. In the 2000s, Cajamar, the leading agricultural credit cooperative in the region, defined the farming model as not only agricultural but also “industrial, in terms of business development and cooperation, performance and organization of production” (Cajamar, 2004:5). At this point no mention was made of the family agricultural model or the intergenerational agricultural knowledge of existing family farms. Faced with pervasive social inequality during the early 2000s, owing to the rapid industrialisation and expansion of the industry, Cajamar’s report shows the institutional effort to validate the innovations, commercial value and stability of the agricultural region as it tried to consolidate its industry and place in the international market.

By 2014, the UN international year of family farming, the scenario had changed. The collective turn towards biological control, as well as the growing global concern with food security and sustainability, led to an institutional image switch towards sustainable and professional production. That year, Cajamar’s research program at the University of Almería organised the first international conference on family farming,

titled: 'The relevance and challenges of family-run farms in sustainable regional development'. This is the first time the notions of family farming and the industry's challenges were brought together in the institutional setting. The conference report, written by regional academics mainly from the University of Almería, under the direction of Emilio Galdeano-Gómez, concluded with a positive outlook:

"One of the differential elements of family farming is that it is not guided solely by profit maximization at all costs, becoming a paradigm of sustainable food production. It is a system that has promoted an equitable distribution of income, greater than in other activities and areas of the Spanish economy. It also has an agroecological role that seeks a more efficient management of basic natural resources, and an increased concern for the environment, promoted by the attachment to land and intergenerational transmission. Its social value is important, for example in the processes of integration of foreign workers, also imprinting on them an entrepreneurial character. Finally, it plays a role in food security that is the basis of the provision of staple foods in the national and international sphere" (Galdeano-Gómez et al. 2014: 125).

'Sacrificio' (sacrifice), 'trabajo duro' (hard labour), and 'espíritu innovador' (innovative spirit), are all keywords used to describe the region. Such vocabulary is not only consolidated through oral history, but also through several news videos and industry documentaries produced in past decades. This includes Cajamar's documentary *50 years of greenhouses in Almería 1963-2003* and Canal Sur's documentary *Plot N°24*. Many of these documentaries and videos were financed by corporate entities, public institutions or the industry's research institutes, and are used to portray the agro-industry in public advertising campaigns. Institutions and companies alike have made use of historically positive narratives and the success stories of the first settlers to deflect from existing social and political tensions and inequalities embedded in the industrial system.



Photo 4: Hortiespaña's pamphlet with the slogan: *Greenhouse crops, the heart of Almería*, and bubble: *Solar Greenhouse: 94% of energy comes from the sun*. (Photo from pamphlet by the author, October 2017)

The industry's communication departments have built a notion of sustainable agriculture using current success stories and the symbol of the intergenerational self-made family farm. One of the most visible examples of this is the campaign, 'Lo estamos haciendo bien' (We are doing it well), from the Inter-professional Organization of Fruits and Vegetables in Spain, Hortiespaña. The campaign, in defence of greenhouse agriculture in Almería, aimed to break down the "negative myths" of plastic agriculture. The campaign brought together the gender-inclusive, insect-friendly, safe and technology-oriented messages illustrated by the stories and narratives of successful farmers in industry. Financed by a combination of public institutions, the EU and private companies, the campaign emphasises scalable factors with reference to technology, the rise in production and resource efficiency, under the slogans "Greenhouses, the heart of Almería" and "We are doing things well". This has

generated a local identity of 'doing well', which features fluid understandings of what 'well' means and generates tensions between what is visually perceived as good practice.

Economist Emilio Galdeano-Gómez has been one of the main academic proponents of the industry's shift towards sustainability, showing the strengths of an agricultural model of development that combines small farming families, cooperative entities and supportive institutions and auxiliary industry (Galdeano-Gómez et al., 2011; 2013). His work has highlighted the neo-endogenous development model of the industry (Galdeano-Gómez et al., 2011), the key role of family farms and agricultural firms in stimulating sustainable development in the industry (Galdeano-Gómez et al., 2013) and the adaptive capacity of small farmers cooperatives in response to increasing market productivity demands (Galdeano-Gómez, 2006). His work has also addressed the increase in productivity and positive environmental spill overs of agricultural firm investment in environmental practices (Galdeano-Gómez et al., 2008), the benefits of combining of top-down and bottom-up approaches to agricultural sustainability (Bonisoli et al. 2018) and the importance of building an environmental corporate culture and management for the agri-food sector (García-Granero et al. 2020; Galera-Quiles et al. 2021).

This work has been significant to frame family farming as an object of study in the region. Yet, the lack of attention to the social and economic differentiation of family farms and how these reshape long term family farming practices, creates an appearance of the family model as a unitary category encompassing all forms of family farming. This is problematic because it elides different sets of historical conditions that transform production models and the families that compose its labour force. The work position and condition of the family members are shaped through capitalist commodity relations, differentiated in terms of class, nationality and gender. Through the process of agricultural intensification, such differentiations have become internalised within farms and agricultural firms, consolidating as circuits of reproduction.

The differentiation of small-scale family farms has been central in framing agricultural development debates, including the Chayanov-Lenin debate on the Russian peasantries, which influenced the development of peasant studies. This debate can be applied to the current framing of family farming in Almería, with a group of scholars, predominately those associated to the industry, defending the unitary character of family farms (Galdeano-Gómez et al., 2011; 2013) and critical scholars, focusing on processes of differentiation among workers and family farms (Martínez Veiga, 2001; Checa et al. 2018). The industrial logic of western Almería, shows a revival of Chayanov's argument by perpetuating the idea of an unchanging peasant household through the family farming model, while minimising the unequal socio-economic conditions of the family farm and focusing on its resilience capacity. Opposing this view, critical scholars in the region have expanded their research beyond the logics of peasant farming, focusing on the global processes that have shaped differentiation among types of family farms and types of workers. The following subsection will explore how this debate has shaped the anthropology of agriculture and peasant studies.

Family farming and class differentiation in peasant studies

Chayanov, the agricultural economist leading the Russian Organisation and Production School, denied the existence of class differentiation based on the internal logic of peasant economy, whereby small family farms resist capitalist accumulation to preserve the needs and improve the status of the cell of the peasant household (Chayanov, 1966). On the other hand, Lenin (1967, Chap. 4), Marx (1976), Engels (1951), Kautsky (1988), Luxemburg (1951) and Gramsci (1971), defended the idea of class differentiation to account for the different origin of peasants, the different forms of capitalist development and the mechanism that enforce different production and labour regimes according to social relations and divisions. For Lenin, "the famous small noncapitalist agriculture, based on the individual's labour" was "just a myth"

(1966:33). As Henry Bernstein suggests, the work of the Marxist school of peasant studies has been framed around the understanding how the “different sets of historical conditions, the dynamic of the development of capitalist commodity relations shapes the conditions, practices and fates of petty producers – and indeed is internalised within their enterprises and circuits of reproduction” (2009:66).

Shanin (1972) and Lewin’s (1968) work was key to developing the academic discussions concerning class differentiation and demographic differentiation leading to the emergence of peasant studies. Peasant studies scholars have studied class differentiation by analysing countertendencies in the development of family farms (Kritsman, 1984), the role of patriarchy in the processes of family labour division and partition of the land (Harrison, 1977a) and the processes of divergence and polarisation of the peasantry (Byres, 1972; 1981). The debate on 'Simple commodity production' (SCP), developed by Ennew et al. (1977), Bernstein (1977) and Banaji (1977) brought a differentiation between the capitalist farm enterprise which relies on wage labour and seeks profit maximisation, and the farmer unit of production, understood as “a producer who combines domestic labour with salaried labour, but who also accumulates capital” (Archetti and Stolen, 1975:149).

Luis Llambí made the distinction between 'petty capitalist production' and 'petty (or simple) commodity production' (1988:353), while both seek capital accumulation to be able to subsist in the market, they differ in terms of scale of production and “in the distinction between a combination of owner-workers and hired workers, on the one hand, and, on a larger scale, wage labour relations exclusively” (1988:355). The distinction between petty capitalist producers and petty commodity producers started emerging at the end on the 1980s in western Almería, transforming the social reproduction of family farms. On one hand there were a small number of wealthier family farms (petty capitalist producers) with higher access to production resources. These involved material resources, but also access to production oversight by specialised agronomists and the advice of financial advisors to run their farms as enterprises. On the other, there was a majority of family farmers (petty commodity

producers), who sought to accumulate financial surpluses, but were largely indebted and had to rely on salaried labour and the self-exploitation of family labour to be able to sustain their production. The asymmetry in forms of integration into the agricultural production chain, reveal the mix use of non-remunerated labour of family members and wage labour embedded in the reproduction of the different family farms. This distinction is problematic, as Llambí suggests, because “they sometimes coexist within the same economic branches and are subject to the same economic and political regulation, and, besides, they both use the same labour pool: the owners' household and the labour markets” (1988:353).

Bernstein (1987) and Gibbon and Neocosmos (1985) expanded the notion of ‘petty commodity production’ to explain how the combination of capitalist modes of profit-maximization and wage labour within a single family is not exclusive to the agrarian sector. Petty commodity production can be observed in all sectors of the economy at different stages of development and has been a central concept within debates on the ‘articulation of modes of production’. These debates suggest the modes of production of the family unit and the processes of differentiation are influenced by the pre-capitalist relations and production techniques of family farms and their modes of transformation, adaptation and reproduction (Chevalier, 1983). In this sense, the focus on adaptation and life-sustaining strategies is relevant to understand family farms (petty capitalists and petty producers) as dynamic formations situated in specific historical conditions that produce varied forms of social reproduction.

Mann and Dickinson (1978) and Servolin (1972), argue petty production emerges when households do not have ownership of the land and when they cannot cope with the technical changes in production required to manage the reproductive cycle of biological crops in order to maximize output. Friedman’s work has been specifically relevant to identify the historical specificities and state interventions that gave rise to industrialized wheat farming by family farms in United States and Canada (1978). She suggests differentiation arises when there is “not only commodity production, but the full commoditisation of the labour force within the economy” (Friedmann, 1982:9).

This gives rise to sustained distinctions in modes of production and in means of social reproduction and requires especial attention to the generational renewal, the balance between consumption and investment, the interchanges between the household and the enterprise and the agency over labour and leisure. She suggests “the law of value stops at the boundaries of SCP enterprise, whose internal relations are governed by other principles, generally variations of the gender division of labour, kinship obligations, and patriarchy” (1982:12).

As Chevalier points out, the 'logic' governing 'petty commodity production' encompasses “a strategic subsistence component” and external labour, whether through off-farm labour or through hired workers (Chevalier, 1983:177). The ability of family farms to subsist in the market is affected by the “principle of concrete economizing” (Chevalier, 1983:178) of families, combined with local and personal specificities, generating different combinations of subsistence strategies and profit-maximization strategies. The ways in which each strategy emerges, develops, transforms and persists, produce an uneven development of social productivity. This entails, as Friedmann (1982) proposes, a careful examination of the historical processes in which family farms have been immersed, showing the forms of resistance and the condition of existence, but also the sustained reproduction of the family farm across time through different capitalist arrangements. For this reason, the next subsection explores the history of western Almería as the basis from which to understand the processes of differentiation in family farming.

Processes of differentiation of family farming in Western Almería

For the first part of the 20th century families in western Almería made a living harvesting grape in the hills surrounding Dalías and fishing in the coastal areas. The international distributors, who were buying local grape crops, forced family farms to fixed price contract farming, following the American plantation model. At that time, the town of El Ejido did not exist and there was no horticulture farming in *El Campo de*

Dalias (The fields of Dalías). This changed in the 1950s, when the National Colonization Institute (NCI) of Franco's regime, declared *El Campo de Dalias* an area of national interest for agricultural development, building the first settlements and water wells. The NCI became the ruling authority in name of Franco's regime with two objectives: 1) colonise and repopulate rural Spain after the war 2) ideological depuration through a social development spirit (Tordesillas, 2010:185). This led to a new type of contract farming, whereby landless peasant families, the 'colonos', were given houses and land in exchange of a rent to the state. Those families who owned and worked on less than 3.5 hectares of land but didn't have irrigation were considered reserve owners and received help from the NCI to build irrigation systems (Jiménez Díaz, 2011: 192). Those smallholders who did not work the land had their land expropriated. As such, most families were forced into establishing irrigation systems so they could work or sell their land (see Rivera, 1997 and Téllez, 2000).

This period was socially and technically significant given the importance of irrigation, and the formation of a new category of middle-class farmers who were previously landless or subsistence farmers. Despite these significant changes, scholars have been cautious of addressing the regional transformation as an agrarian reform as it builds on networks of dependence with the institutions controlling its development (see Bosque, 1984 and Centellas, Ruiz & García-Pellicer, 2009). Farmers who did not own enough land to sustain themselves generally had to work as seasonal wage labourers in Almería and other provinces, expanding the range of occupations and sources of income available to family farms (Jiménez Díaz, 2010:119). This was derived from the negative economic condition of the region up to mid-seventies (Puyol, 1975).

During the late 1970s the region underwent a substantial economic improvement due to the emergence of local cooperatives, input suppliers, distributors, national and international credit banks and research centres. The need of extra labour led to a wave of internal migrants at the end of the 1970s. These became known as the *Jornaleros* (wage labourers) who left their home villages in the Alpujarras Mountains in search for labour, forming the core of the labour force during the initial phase of

agricultural development in the region. In some cases, the *Jornaleros* were able to acquire land, relying on harvest credit, the “self-exploitation” of the family unit to meet productivity standards and the continued dependence on external inputs to maintain a steady increase in production output (Checa et al. 2018:321). The unplanned boom of agricultural credit, greenhouses expansion and increase in productivity, led many families to a spiral of indebtedness, continuously seeking to buy more small farming units to pay off their investment in the first farm (Molina, 2002).

The 1980s were marked by Spain’s entry into the European Union, giving local farmers access to the international market. By mid-80s, 1600 hectares of land had been expropriated of autochthonous peasants and 80% of the 14.000 hectares of active greenhouses and farms in the region had been developed by the NCI (Jimenez Díaz 2011:192). The region consequently continued operating under a family farming model, due to the small unit distribution of land inherited from the politics of the NCI. However, the 117/1984 decree of the Junta de Andalucía suspended all subsidies and state credits to producers due to the severe over exploitation of aquifers and the plastification of the territory (Martínez Veiga 2001:26; Palomar Oviedo 1994). The decree left family farms unprotected by the state, accentuating their dependence on international agro supply chains to meet international demands in the context of state cuts to subsidy support.

The demands of the agricultural production network led to the introduction chemical pest control in 1982, thermic plastic in 1984, pipes with integrated drip system in 1986, soil-less plantations in 1990 and pollinizing bees in 1991 (Lavandera and Checa, 1981). Consequently, while at the beginning of the 80s, a single family could provide enough labour for the average 2-hectare farm, at the end of the decade the labour demand had significantly increased, leading family farms to source cheap and flexible foreign labour, to meet the needs of production. As Martínez Veiga (2001) suggests, this led to a process of ‘encapsulation’ of producers leading to a strong cohesion between farmers, united by a common feeling of isolation and contributing to the later

segregation of foreign labourers (García, 2002). In the 1980s there was also the growth of farming cooperatives as a base on which the fabric of production of input companies, processing industries, marketing companies and research centres was developed. Through targeted product campaigns, international seed, fertilizer, pesticide, plastic and insect suppliers, with headquarters in the region and managed by local workers, introduced the first technological innovation that would make greenhouse production internationally competitive. These technological innovations were first adopted by cooperatives, as they could easily disseminate new agricultural technologies among their members. Farmers selling to cooperatives also had an important role sharing and evaluating the outcome of each technology in their communities, gradually influencing the technological adoption of other farmers in the region.

Galdeano-Gómez et al. (2011) have highlighted the importance of cooperatives for the concentration of production, enabling family farms to manage their crops and organize the direct sale to the market. They suggest this produces a vertical integration of family farmers, who in turn retain income in the sector. Building on an internal uniform logic of family farms, they further suggest the concentration of producers through farming cooperatives, counterbalances the strengthened market position of large input providers and large commercial chains, improving family farmers' agency and economic returns. Pérez-Mesa and Galdeano-Gómez's (2010) analysis serves to locate cooperatives within the agricultural sector as a technically and administrative differentiated whole. Their work is also significant to show how family farmers ascribe different value and importance to capital accumulation (profit-maximization) and investment (improved ability to meet household needs). Understanding farmers' systems of valuation is essential to develop effective cooperatives that guarantee a sustained economic position for family farms. However, their analysis of cooperatives omits the processes of self-exploitation of family farms generated by the process of vertical integration, including the dependence on financial credit and distribution chains. From this point of view, the benefits of the concentration of producers in cooperatives are not so clear. On one hand, the volume

of concentration of produce is too large to limit the sale to regional and national consumer markets, on the other, the volume of production remains marginal for large supermarket and distribution chains, leaving cooperatives in a position where they do not have the bargaining power to improve the terms of sale or the market position of its members.

Effective cooperation, as Chayanov (1991) proposed, requires state support and regulation that protects family farmers from the adverse effects of vertical integration in commodity markets, including processes of family farmers self-exploitation. In western Almería, the combination of lack of state support following the subsidy cuts in the 1980s – and the pressure of the distribution companies of the industrial cluster to cut production costs while increasing outputs – has led to the normalization of the self-exploitation of family farms and the exploitation of wage-labourers (Corrado et al. 2016; Pedreño Cánovas 2012; 2014). As farming cooperatives started to mimic capitalist large scale distributors, they continued their model of expansive reproduction at the expense of cutting labour costs. This phenomenon has been studied for its similarities to the Californian model of agriculture, which analyses the use of migrant labour as a structural necessity for the functioning of the agricultural sector (see Berlan 2002, 2008 and Giménez 1992). Regional scholars have framed it as ‘the southern Mediterranean model of agricultural exploitation’, whereby foreign labour is seen as flexible (willing to work occasionally), abundant (working when the farmers need them), heterogeneous (willing to accept lower wages depending on their nationality) and anonymous (without sustained work relation that bound them to any family farm) (Checa et al. 2018:315).

Since the 1980s the reliance on foreign labour became essential in the region to reduce the risk of investment (Checa et al. 2018:318), establishing and normalizing the existence of temporary labour (De Bonis, 2005; Hoggart-Mendoza, 1999; Pedreño, 1998) and leading to modern day slavery conditions for foreign workers, including through racism, precarity, isolation and marginalization (Asociación Columbares, 1997; Checa et al. 2016; Colectivo IOÉ, 2005; Reigada, 2012). Combining social, legal

and administrative barriers, the industry and its institutions restrict labour mobility while guaranteeing excess labour to be able to satisfy labour needs and maintaining competition through continued pressure on wages (Berlan, 2002). This trend is consistent with the case of Mediterranean agriculture in Italy (Checa, F. et al. 2018), but also in France and Germany (Morice y Michalon, 2008) and across Eastern Europe, (Chierichetti, 2011; Cosma et al. 2020).

By the 1990s family farms in western Almería had been reduced to a petty component of the glocal productive fabric, dependent on large supermarket chains that control the international market price, as well as their means of production, even before starting the production process (Aznar- Sánchez et al., 2011; Aznar- Sánchez and Sánchez-Picón, 2010; Jiménez Díaz, 2008; Galdeano, 2003; Molle, 1992). The low interest and ease of obtaining agricultural credit, alongside increasing production input prices, led farmers to increment their credit loans (Delgado Cabeza, 2006). “Increasing expenses, compared to insufficient income, are the two components of the clamp in which forced agriculture in Almería is caught” (Delgado Cabeza, 2006:112). According to a study by the Ministry of Agriculture and Fisheries (2003), 73.6% of farmers in the region were affected by debt in 2003, a sum that amounted to 1,493 million euros.

Since the 1990s, the unit of residence has become increasingly distanced from the unit of consumption through the process of professionalization and the labour of family members from different generations is now distributed around agricultural activities in parallel to the small intensive units that belong to each part of the family. Families still entertain close relations, meeting and eating together in the family house that mostly still works under the authority of the patriarch, the oldest male owner of the family farm who subdivided the land among its heirs. However, family relations are increasingly distanced from farming and each heir of the subdivided land tends to manage their plot of land independently. The social configuration and reproduction of family farming in the region aims to have many members of the family become independent landowners, assuring the social position of autonomous family farmers

to each offspring, a characteristic that is consistent with studies of social reproduction in coastal agriculture across Andalusia (Cruzes Roldán 1992:176). The push to become independent landowners is derived from the need to increase the capitalization of each sub-unit of the family land to financially sustain each branch of the family. Intensive farmers are consequently relatively young, withstand higher risk through technological renovations and intensified modes of production to increase output and capital (Ferraro, 2000:115; Jimenez Díaz 2011:195).

The decision-making processes is often a male dominated process, including the decisions on seed varieties to plant, method of production, the distribution of labour tasks in the production unit, the sale of the produce and the financial and admin work. Even if the land is divided equally in half among two siblings of different gender, in the case of female inheritance, the male partner tends to be the one making decisions outside the greenhouse environment, including the fiscal and financial administration of the land and produce sales. The process of exclusion of women from the management of greenhouses, has often made their labour dispensable and malleable, having to change tasks in the greenhouse constantly to support their husbands and being forced to leave the greenhouse to search for external work, for example in packaging warehouses, to provide additional income. The distantiation of women from farm labour can take place for two reasons. It can be due to a poor management of the intensive modes of production with low or no return to investments, pushing women to search for external labour. Alternatively, in the cases where farms operate like a business and have positive economic returns, women's labour tends to be substituted by hired labour through a process of "defamiliarization of the agricultural holding" (Jimenez Díaz, 2011:197).

In both cases, labour is organized by the head of the farm and is undertaken on a seasonal basis by wage-labourers, predominantly Moroccan males who often work informally and are paid less than autochthonous wage-labourers. However, for the farms that struggle economically, the output of production is not enough to meet the cost of investment and salaries, or these are just enough to pay the harvest loans that

would allow them to get further credit for the next harvest. Financial instability often results in a situation where the family's sustenance needs to be sought from alternative means. Sourcing employment outside the farm is falsely conceived as a temporary change, as the long-term prospects for the family are no longer tied to the land, but to the increasing production demands and decreasing price of vegetables in producers' markets set by the industry. The price crisis therefore accentuates situations of indebtedness at the farm and the search of external income by women and their offspring.

In the cases where the output of production produces enough benefit to sustain the family and production, the farm and the family are often managed as two separate units of consumption. The farm is managed as a company from which the farm head and external workers receive a salary to be used by the family. Sourcing hired labour for the farm, and having the financial family needs covered, allows the children to study and seek their own profession while also allowing women to dedicate themselves to family care or other activities of their own interest. As previous regional studies suggest, there has been a "relative detachment of the family from agricultural tasks" (Jimenez Díaz, 2011:197).

Gender analysis in peasant studies added complexity to the analysis of the social boundaries of the different types of capitalist engagements in family farms and classes of rural labour. It has been suggested women are adversely affected by labour flexibility and precarity in intensive agriculture (Barrientos et al. 2004; Deere, 2005; Arizpe & Aranda, 1981; Lara Flores, 1995; Benería, 1991; Sassen, 2003). Women's labour allows agricultural companies to cut production costs and to increase productivity, based on the idea that women are more responsible and efficient undertaking their work tasks, while demanding lower salaries than men do. At the same time, values such as attention to detail, careful observation, meticulous fruit harvesting and care for the plants, that have been historically attributed to women, are increasingly sought by the agricultural industry for cultivating greenhouse crops, giving specificity and form to female agricultural labour (see Cristina Cruces, 1993:3).

The valuation of women's agricultural skills has led to the feminization of certain types of labour, like strawberry harvesting in Huelva, or pest control and tomato selection in western Almería farms and packaging centres. Yet, it is not a static feminisation, as Assumpta Sabuco (1999) shows through the example of rice cultivation in Valencia. It changes across time and leads to the polarization of gender roles, including the masculinization of women who undertake male tasks within the productive environment. The adverse effect of capitalist development for marginalised small scale female farmers and petty workers became consequently an active field for debate (see Boserup, 1970; Rubbo, 1975; Omvedt, 1978; Stoler, 1977; Etienne and Leacock, 1980; Mies, 1980; Beneria and Sen, 1981).

The work of Alicia Reigada on female labour in the strawberry fields of Huelva has been significant to show the similarities between women farmers and women labourers in Andalusia. She suggests women's labour in Andalusian agriculture is considered as "lending a hand", "a punctual help complementing the work of the husband during the intensive work campaign periods" (Reigada, 2012:115). This is contingent on women's reproductive cycles and the needs of the market. This notion is consistent with Susana Narosky's (1988) analysis of the capitalist conception of women's labour as 'help'. To understand the double role of women in the market and the household, it is important, as Reigada points out, to pay attention to women's support networks where the space and rhythm of work is negotiated and distributed among the women of the family (2012:116). It is equally important to look at the division between women, for example the distancing of wives and daughters from the greenhouse. This trend creates a division between women farmers, who prefer taking jobs at the packaging centres, and women labourers, who are consequently displaced from the packaging centres and forced to wage-labour at the farm, exposing processes of differentiation based on class and ethnicity.

There are also increasing inequalities derived from the processes of globalization in which local agriculture is immersed (Alonso, 1999; Delgado, 2002; 2006; Mills, 2009). The bulk of family farms oppose the free market treaty between the EU and Morocco

as it devalues their production in favour of cheaper products. Yet, they continuously sell their produce and labour to the same distribution chains and international corporations they oppose. Similarly, wage-labourers oppose existing labour conditions, but they continue withstanding them to save money to send to their families back in their home countries. Local farmers and wage-labourers have become increasingly linked to distant territories through different financial and affective processes (Beck, 2008:148). Yet, the entanglement between the local and the global spheres is made possible due to processes of labour precarity and flexibility, which affect wage-labourers and family farms.

Farmers' and labourers' "seemingly unavoidable participation in the agribusiness model" makes them party to the destruction of the very intergenerational non-scalable values that define their way of life (Sessions, 1997:185). This is accentuated by the industry's use of farmers' success stories in public discourse to distract public attention from the direct forms of oppression experienced by workers. This creates the illusion of care for the local family model, a care which is not reflected in regulation, nor in the intensive agriculture model. Family farms involved in petty commodity production "tends to be more prone to feel impotent before globalization, which is considered as a set of processes lying outside of their will" (Entrena Durán, 2009:537). However, experimentation and the need to survive in diverse agricultural settings around the globe has provided multiple examples of how situated local knowledge can generate sustainable life strategies. Cultural ecologists have explored a number of these examples, including traditional smallholder practices in China (Netting, 1993), vertical zones in mountainous regions (Rhoades & Thompson, 1975), or adaptive strategies based on social groupings (Bennett, 1969). These agricultural practices generally emerge as survival-oriented adaptations, but often suggest the possibility of being useful in the transition to an agriculture that places the natural environment first.

The women informing this research emphasized the creativity involved in the development of family farms, as well as the value of the experience and knowledge of

women, which are “considered innate and not acquired” (Reigada 2012:118). As family farms and hired workers are forced to adapt, “a considerable amount of creativity can be observed” (Entrena Durán, 2009:537). In most cases the non-scalable adaptations documenting the experience and knowledge of family farms are not recognized by the industry, but these have a significant role sustaining the model of expanded accumulation. Attention to these practices can increase species diversity, promote landscape heterogeneity to make the terrain more resilient to weather conditions, and bridge the distinction between gardening and agroforestry as approaches to our caring relationship with nature (Balée, 2006; Fairhead & Leach, 1996). At the same time their embeddedness within the industrial fabric, put this knowledge at continuous risk. Focusing on the process of marginalization of family farming knowledge, the following sections will explore the evolution of small-scale adaptation in family farming and the loss and transformation of these adaptations as they become permanently reconstituted by intensive production.

The origin and displacement of Almería’s family farming model: Weeds, herbicides and the loss of traditional knowledge through intensification

Family farming is not a new phenomenon in Almería, neither is it a product of the current industrial project. The first accounts of regional horticultural production were recorded at the beginning of the twentieth century, in the coastal districts of Balerna, Balanegra, Matagorda and Guardas Viejas in *El Campo de Dalías* (The fields of Dalías). There, the first underground water wells were developed in 1920, and coastal horticulture became stable in 1934, when the creation of the San Fernando Canal brought the installation of electrical engines in the wells to expand irrigation capacity. However, the commercial agriculture of dry crops had been present in the region for over a century.

The towns of Berja and Dalías have been producing and commercialising grape in the international market since 1830. Initially, the farmers would sell their produce to

foreign fruit companies like Sgobel & Day, Swann & Co, Connolly Shaw or Margetson and Co, which would then sell it on the public auctions in the markets of London, Liverpool, New York, Bremen, Hamburg or Copenhagen. The fruit companies paid farmers fixed prices for their harvest, without distributing the final sale profit as they were used to doing in their colonies. The lack of profit gained led farmers to the creation of the first cooperatives and commercial companies in 1940. This gave a dual character to the people of the region, who became both farmers and exporters. The following report is from the newspaper *La Crónica Meridional* in 1934: "A new business and a double activity arose: the one of producer and exporter at the same time, the farmer and merchant forming a contradictory and unique personality. This fortuitous circumstance imprinted character on the export business".

El Ejido was a barren land until 1953, when the National Colonisation Institute (NCI) operating under Franco's regime labelled the area as one of their 'national interests'. The first settlements of *El Campo de Dalías* were Las Norias and San Agustín. As horticulture started spreading across the arid landscape, news of job opportunities started to roll through the mountain villages. The poverty in rural areas after the Spanish civil war motivated peasants from the surrounding villages to come to the coast to make a living. In some cases, whole families left their villages behind and settled in *El Campo de Dalías*. In other cases, it was just the mother or father who left for seasonal work. There were also cases where only the sons and daughters of rural families were sent to the coastal villages. The children would live in the house of a 'foster' farmer in El Ejido, working as day labourers in their farm in exchange of food, shelter and a little payment.

Regretful about sacrificing her education due to her upbringing on the family farm, one of my informants explained:

Lola: Since I was twelve, I have been working as a labourer at the weekends. In May and June, after finishing school at five in the afternoon, I would also work.

My first payment when I was twelve years old was three hundred and fifty pesetas. Today that is called child exploitation. Before, it was called survival.

This is something I really like telling people so that they situate themselves.

When I turned fourteen, I had very good grades and I loved school. My sister, who was not able to study, said that I should at least finish school since she had sacrificed herself. She got her school degree at night, as she had been working with our parents for a small wage [*jornal*] from the age of eleven. Then, when I finished school, she told my father: “I will work whatever I have to, but the child should study. It is all right if you buy more land, but for others to work. She should study”.

I went to high school for a month, then he bought more land and I had to get out. These were the circumstances, but also the mentality.

The previous story is relevant for understanding the endogenous characteristics of family farming. At the beginning of the twentieth century, water was already available in the region thanks to the wells of Fuente Nueva and San Fernando Canal. There was also an awareness that there were large underground aquifers in the region, but these were only explored when the NCI started its agricultural project, expanding the network of water wells to non-irrigated land. The NCI also helped by establishing fencing and sanding techniques, although these were present in the area for long before. The practice of planting side bushes around the field, to block the wind in the first greenhouse structures, imitated the traditional approach to the Ohane grape crops of Berja and Dalías. The practice of sanding, where the soil is covered with a thin layer of sand to increase humidity and soil temperature, is first accounted for on the coast of Granada in 1880 (Palomar Oviedo, 1994:22). While most modern accounts suggest Almería’s model was born in the 1970s with the technological and economic innovations of the NCI and the Rural Credit Bank of Almería (later known as Cajamar), many of the developments in fact followed traditional practices. The characteristic wit and innovativeness of family farmers in the region was a recurrent topic among the older generation of farmers interviewed for this research. ‘Las Isabeles’, three old farmers in the region, who migrated to the region in the ‘70s recalled:

Isabel Gómez: Here inventiveness has been very much at play. There has been a lot of innovation. This was a desert. I remember my grandfather with a sledgehammer breaking the stones all over the land, covering the ground with manure and sand so as to plant. It was not only about the creativity that the people showed to build greenhouses, but also to build them and think at the same time, “the little water we have, let’s ration it through drip irrigation”.

Isabel Fernández: Because now it [Balerna town] looks very pretty and nice, but there was nothing. No lights, how many lights were there?

Isabel Gómez: Nine lights.

Caridad: Nine lights.

Isabel Fernández: There was no asphalt, no water in the houses...

Isabel Gómez: no kindergarten...

Isabel Fernández: Everything still to be done.

Caridad: There were no schools; the lessons took place in warehouses.

Isabel Gómez: There were some schools, but they became too small and then they started giving lessons in the warehouses, without bathrooms...

What was particular to their generation is that they knew they had no means of implementing high-end technology. They observed small practical details and found a way to develop from there. The greenhouses were not made out of solid commercial structures, they were improvised by the families, little by little, and patched up as the wind and time wore the structures down. In this sense, family farming involved an awareness of the climate and its harshness, as well as considerable care for the materials and structures that kept the crop safe. Technology developed through the imitation of techniques already present in nearby regions and the reproduction of those techniques with the farmers’ home tools. It was not a question of lacking resources, but of adopting technology carefully, consolidating knowledge about each new tool with surrounding families, defining the amount of technology each family

unit could handle and preparing for the effect each new tool could have on the family unit. Caridad clarified:

Caridad: When we went to Holland with our cooperative to visit the greenhouses there, we saw they were pulling the plants up and down on a pulley system. This way they could sit down on the mechanical rail between the lines of crops and have the fruits brought level with their arms so they wouldn't have to incline or rise to pick the tomatoes. Here I created a similar system. I got a plastic box and I tied it to a cane with a wire hook to get the peppers. Only here, as soon as I was finished I would have to move the box to the side, so there was a lot of up and down, up and down, we were doing a lot of exercise.

Isabel Gómez: Everything was incredible, but we understood the technology was out of our league. The most important thing was the hygiene. There [in Holland] everything was so clean, and that was also what we could bring back, the cleanliness of the greenhouse. Back home we sewed a small fabric bag to our work aprons, and whenever we saw something in the soil, a bad herb or a leaf, we would put it in the bag. Even Miguel, the agronomist, would come and say, "This pepper is rotten" and throw it on the floor. Then he would realise and say, "Sorry, sorry, we're not allowed to throw anything, that's right". I would tell him, "Yes son, pick it up, because here we fight for hygiene and cleanliness".

However, not all that was gained by the intensive model was necessarily positive for the family. If we look at the example of maintaining hygiene in the greenhouse environment, the intricacies of this practice reveal the "lack of perception of the interconnectedness of nature" when using the nutrients of organic matter that falls from plants (Bradley, 1997:290). Las Isabeles started out farming on communal land in Balerma in the '70s, emulating Israeli Kibbutz. For a period, the families in the commune worked the land together, but gradually they saw their project fall apart, as people started leaving and starting their own projects. Likewise, families and labourers who had come from rural Almería saw an opportunity and began buying land to begin their own family farms. The individualisation of farms was accompanied

by the intensification of agriculture in the region, which displaced the productive labour going on at the farm and moved it to the mass external input producers.

The work of Candice Bradley (1997) exemplifies this phenomenon by looking at the loss of weeding in industrialised agriculture, where the labour of women weeders was substituted for plows, herbicides, pesticides and resistant hybrid seed varieties. She argues that the transfer of responsibility for weed control produces two types of displacement. First there is the transition from the “hands, hoes, and digging sticks wielded primarily by women to the destructive and polluting weed-killing technology used mainly by men and corporations” (Bradley, 1997:290). As the woman’s role in the field is forcibly reduced, the industry redirects her productive capacity to low-paid wage labourer positions in the packaging and manufacturing parts of the agricultural industry. This coincides with a second type of displacement, “the denuding of the soil, the destruction of wildflowers, and the pollution of the surrounding area with chemicals” (Bradley, 1997:291). By highlighting the links between the displacement of women, non-humans and their existing ecologies, Bradley demonstrates how the loss of traditional practices produces new ecologies that are not necessarily healthier for the humans and non-humans involved in production and consumption.

In Almería, the displacement of weeding not only deprived the soil and other species of the benefit of having weeds as a source of nitrogen and food, but it also transformed the look and taste of vegetables and took work from the devalued weeders by offering a fast-action commercial product to kill weeds. While technological adoption in the region was not necessarily sophisticated, it was largely ideological and was therefore often system changing. It was ideological because it developed from strong convictions tested by trial and error, ceasing to be a replacement strategy to become a moral standpoint. Weeding ceased to be practiced as farmers gradually integrated the methods of intensive production, including industrial tilling and soil sanitation techniques. The fact that the practice stopped is not necessarily the problem, as agroecological studies show weeds are necessary to maintain soil humidity through the green cover. However, weeding stopped because certain notions of hygiene were

imposed. This was system-changing because it allowed for paradigm changes, making a humble farmer like Isabel proud of her hygiene practices and the professionalising efforts she was making with the agronomist visiting her field. This was not based in vanity, but in a willingness to spread the knowledge around, even if the agronomist was supposed to know better. But as this case shows, the method matters. The discontinuation of cultural practices in favour of invasive weed control has been to the detriment both of those involved in production, now constantly exposed to chemicals and at higher risk of pulmonary diseases and cancer, and of the soil and water sources, now severely polluted and contaminating to non-human others.

The role of women weeders during intensification is revelatory of how non-scalable factors of production (soil-enriching qualities, nutritional properties and biodiversity conservation) are dismissed by the industry, making coherent traditional ecological practices disappear. In this sense, chemical weed control is an example of what Shiva calls maldevelopment, as it is "a development bereft of the feminine, the conservation, the ecological principal" (1989:82). The industry has taught farmers to reverse their understanding of autochthonous weeds. The eco-feminist approach taken by this thesis, seeks to unpack the maldevelopment taking place as well as the existing eco-feminist agricultural alternatives being proposed across the region. One of the paradoxes showing the degree of nature domestication in Almería is its symbol, the agave plant. While it is thought to be an autochthonous plant, this American plant was introduced to the region in the '50s by the Ministry of Agriculture, to be used for fabric manufacturing. However, the plants were never harvested, and the hundreds of hectares planted multiplied themselves in an invasive manner (Badano y Pugnaire 2004).

The agave plantations have spread to all the regional natural parks, which while being vast in comparison to other regions in Spain, are frequently surrounded by the imposing greenhouses. Because they are found at the edges, the agave plants contrasting with the greenhouses lend a false feeling of observing the wild set against the man-made, yet both are transformations of the natural environment. While seeing

an agave plant seems less invasive, or more natural, than seeing the vast expanse of plastic greenhouses, they are the evidence of a continuous effort to tame nature, with their relation to the natural world and the autochthonous flora inevitably being that of an intruder.

For the past couple of years, Lola, who as described above has farmed from an early age, has been working with Yolanda García from the Michelin Star restaurant Alejandro, in Roquetas de Mar. They have a project to recover autochthonous weeds and create culinary uses for them. Within the pedagogic greenhouse project which Lola runs with her husband, planting weeds has been an innovation that they have struggled to agree upon. Lola's husband told us,

Lola wants to plant the same bad weeds that grow naturally on the edges of my greenhouse, and which I've been trying to kill ever since we have the greenhouse. It doesn't make sense to plant them now, especially if it's just for one restaurant, which wants yearlong supply and very small quantities of each weed. It's not good business.

In the greenhouse, farmers use herbicides to get rid of even a minimal presence of weeds. After a severe marginalisation of weeding in intensive farming, Lola's husband is unable to change his understanding about planting weeds. For him, killing weeds is the accepted cultural practice, the solution that is culturally and socially accepted in the region. Meanwhile, preserving weeds has become synonymous with being dirty or not maintaining hygiene. As the knowledge of technological adoption spread from the older generation to younger ones, the careful testing and trial-and-error verification system of the former transformed into fast-action chemically intensive agricultural practices, which have become the cultural norm since the 80s. This also includes pluriactivity and complementary income jobs, which have become the dominant strategies of life sustenance in most family farms since the start of the industrial boom. As part of this process, weeds are redefined and their traditional uses, largely practiced by women, are neglected as they seek alternative work outside the farm,

favouring the use of plows, herbicides, pesticides and external inputs over traditional ways of working the land (Bradley, 1997).

This is detrimental to women and their intergenerational agricultural knowledge, but also to the environment itself, which becomes increasingly polluted. What the productive environment gains from soil hygiene does not offset what it loses as a result of killing weeds with chemicals, which includes the soil fertility gained from burning the weed undergrowth with its nitrogen-fixing properties, as well as the food and shelter weeds provide for other species, especially the auxiliary fauna released for biological control between harvests (Bradley, 1997:292). While the ecoenergetics of production are lower for the farmer, common herbicides sold in Almería, like Monsanto's Roundup (glyphosate), are not selective; they kill all weeds, plants and insects and pose a risk to humans exposed to them as it is "associated with skin disorders, genetic mutations, cancer, premature births, and birth defects" (Bradley, 1997:296). The destruction of weeds in the name of sanitised production environments reflects a lack of understanding of the ecological interactions involving weeds, and of our eco-dependence on these interactions (Warren 1991, Warren and Cheney 1991). Here the argument is not in favour of reintroducing weeding, but about understanding the processes of knowledge marginalization as industrial technologies transform and substitute small-scale family farming practices. Recognising weeds as autochthonous plants and acknowledging valuable intergenerational family farming knowledge, which is often preserved by women but has nonetheless been marginalised, would be as Plant suggests, a sensible step if we are to "heal the wounds" (Plant 1989:4).

The disappearance of non-scalable factors in family farming

'Las Isabeles' claim that one of the biggest problems of the industrialisation of family farming has been the distancing of education from the rural space. They did not believe that children should go back to working in the greenhouse, as they did, rather that they should have more contact with its rhythms. Ángeles, the daughter-in-law of

one of 'Las Isabeles', said assuredly that every morning as she walked into the greenhouse she would greet her plants, saying "Good morning beautiful", and then ask how they had spent the night as she caressed their leaves. For her, that positive energy was the most nurturing inheritance from pioneer women like 'Las Isabeles', a form of intangible, non-scalable knowledge that creates wellbeing for herself and her plants. When asking Lola if she felt the same thing, she replied:

Lola: I am passionate about agriculture, and this is going to seem very 'enlightened'. Sometimes when I tell this to people, I say sorry because they might think I'm losing it. We have a very big problem. Generally, as humans, we think we are superior to other living beings. The problem is not with the other living beings, like the vegetables; it is we who have the problem. We have a very strong communication problem with plants. Plants are as intelligent as humans. They are nobler and share more than we do. They also fight. But I say that if people knew a bit more about the vegetable world and tried to apply it to their everyday life, maybe society would change its values.

Lola, like 'Las Isabeles', revealed herself as a woman of the collaborative, trial-and-error agricultural philosophy. Technology was never a goal for these people, nor was increasing their net production. Instead, they took pride in their history, as well as their own lifetime of work underscoring the value system inherent to the natural environment. This has helped them build a relationship of care with plants, whereby they have realised that change needs to come progressively at a pace dictated by the family's capacity for adaptation; not faster, not slower. It should be noted that while the gradual technological uptake is consistent for most small family farms, in most cases this is limited due to financial constraints and risk. In this sense, the affective relation farmers have with plants and the cautious uptake of technology should not be seen as an idealization of pre-industrial practices or an illustration of enhanced sensorialities. For many farmers it serves as a narrative to sustain their everyday activity, despite the financial risk. Diverting attention from economic instability

towards natural relations in the production environment is a part of the non-scalable factors that are now put in jeopardy by the demands of the industrial production system, including the production of a standardized industrial practice and taste, which is in turn impairing generational uptake and knowledge transfer.

Family farming has developed numerous non-scalable strategies to compensate for the profitability crisis. The need to cut labour costs has been addressed through an intensification of family labour, a reduction in leisure expenditures, the search for complementary income outside the family's productive unit, the separation of family farms into different businesses, and the integration of underpaid and often informal external labourers, predominantly of foreign origin, to carry out the heavy duties within the productivity structure. These non-scalable adaptations are not seen as ideal solutions, but as temporary fixes to current contingencies. Yet, these strategies are not temporary and have been ongoing since the 80s, accentuating the increasing uncertainty and loss of control experienced by family farms in relation to the productive structure. Non-scalable strategies are not always desired as they often help to sustain production when families struggle financially. This is done at the expense of higher levels of self-exploitation and precarious hired labour, sustaining rather than transforming livelihoods.

The combination of factors described above degrades agricultural labour by making the farmers dependent on precarious and exploitative measures that will guarantee temporary survival while undermining the accumulation of autochthonous farming knowledge (Van der Ploeg, 2010). As farmers lose control of the farming space due to external market demands, there is a distortion of essential features, including labour interchanges, support between families, the intergenerational care and communication between farmers and plants discussed by Ángeles and Lola, the respect for enduring production practices like Lola's weed-planting for culinary use, and the forms of community collaboration aimed at making society progress as described by 'Las Isabeles'. Many of these features are now undermined by unhealthy

competition, processes of self-exploitation, the exploitation of foreign workers and the financial and output demands created by the industry.

Joaquín, a fit young farmer, claimed: “The greenhouse, we work it my wife and I, the two of us”. Upon being asked if the work was not too much for the two of them and if he considered them to be engaging in self-exploitation, he answered: “There is no exploitation here, we work and we make it happen and if I need help at any point, I hire black people informally [*contrato a negros en negro*]”.

Joaquín, like many of the younger farmer, did not fear breaking labour laws. For him it was part of the exercise of family survival in intensive agriculture. Unlike the managerial farmers who had time to network with different cooperatives, and most importantly buyers, in order to get a good price, people like Joaquín continue to depend on the fluctuating price given by the *alhóndiga* (auction centre). Feeling exploited by the system in the name of reducing costs and increasing production, his logical reaction is to apply the same pressure to the family unit and the occasional workers. Yet, these practices are not exclusive to the smallholder farmers, as larger greenhouses with higher profit margins are continuously denounced by the Andalusian workers union for paying labourers less than the minimum wage for agriculture, and for declaring the social security contribution for only a portion of the days worked by the labourers. This situation reveals that the practice of cutting labour costs is widespread across the different groups of farmers, regardless of the farms’ profit margins or their level of professionalisation. There is a contingent of farms that do provide payment according to the established regulation, but the widespread tolerance of the practices of paying less than minimum wage, defrauding the social security declaration and hiring workers informally, is often used as justification for the continuation of those same practices. Joaquín explained:

Joaquin: I take my child to a private school, my wife and I both have cars and we travel, this year we are taking the kid to Disneyland.

But you don't know what it is, you don't know what it is to wear the same trainers for three years because there is no money at home.

The land I have is the land that my wife's dad gave to her, and we bought more land afterwards, just the two of us working. Now we are planting watermelon, and that's just to cover costs; the real profit comes from September to March when I get 50,000 Euros clear profit from the peppers, with which we can live.

I do everything the *alhóndiga* (auction centre) tells me to do, I respect the minimum residues allowed for each pesticide I use, but with the workers I can cut costs. If not, there isn't enough for the family, and when we can work on our own I save that money.

Countering the industry's position on the sustainability of family farming (Galdeano-Gómez et al. 2013; 2014; 2018), the current scenario for family farms does not enhance the dynamic management, adaptability, innovation and business entrepreneurship of farmers within the industrial conglomerate, leading to increased participation of production actors, social capital and social cohesion. Instead, farmers are subject to the dictates of the commercialising houses, auction centres and cooperatives which manage family farms according to the standards set by supermarkets and the demands and regulations of the global trade of agrarian products (Weis & Weis, 2007; Naylor et al. 2009; Galdeano-Gómez et al. 2016).

The existing "economic coercion" and social tensions embedded in the structures of the agricultural industry have inexorably transformed traditional forms of production and continue to widen the ethnic and gender divides. They have done so by eschewing fair recognition of the centrality of women and migrant labour to the economic progress of the industry and to the social reproduction of family farms (Delgado Cabeza et al. 2015; Pedreño Cánovas, 2014). Delgado Cabeza et al. suggest that the subordinate position of farmers and their self-definition as working-class smallholders attenuates their indebtedness and "helps dilute in the social imaginary

the asymmetric capital-labour relationship, invisibilizing the essential contribution of migrant [and women] labour to the social reproduction of the model” (2015:45).

Consequently, traditional eco-social cornerstones such as the efficient use of resources, the preservation of the natural environment and the use of traditional seeds and biological pesticides, have been overshadowed by the norms imposed by certifying companies and European regulation, which place the focus on food security and traceability rather than on holistic care for the natural productive environment (Peeters, 2011; Bacon et al. 2012). By holistic here, I do not refer to a fixed valuation system, but to the human capacity to endure production while sustaining resources. This idea is central to the current framing of the circular economy, yet it is inefficiently transferred down to the agricultural industry. This is because the management of technology and input production, historically distributed by regional companies, is now controlled and supplied by large international corporations who have competitive advantage and dictate the trends in seed varieties, pesticide use, quality assessment and added value. These companies do not take local knowledge into account because they do not need it to meet standard regulations, or to continue making profit. The long-term conservation of the natural environment and family farms is not their objective. Yet, it is the objective of many farmers who take marginal actions that suggest forms of relating to the environment that represent an alternative to dominant industrial model and resource exhaustion.

The sustenance of resources and the environment depends on the local conditions and culture, as such it needs to emerge locally, as a negotiation of the non-scalable family farming strategies that can endure a sustainable future (i.e., care for plants), rather than those which perpetuate inequity (i.e., self-exploitation and precarious hired labour). We need to address the logic of competition and indebtedness that prevents farmers from fighting their loss of non-scalable values (Warren, 1987). Even when individual farmers manage to maintain certain practices, like talking to plants, there is no place within the industrial production discourse to accommodate such knowledge. As Sessions describes it, “the world becomes “despiritualized,” other dimensions such

as the joy of work or aesthetic values become secondary if not irrelevant, and even family and community life are valuable only insofar as they contribute to economic life" (Sessions, 1997:179).

The critical work of regional scholars suggests the local productive capacity of family farms is based on the intensive use of land and resources, as well as the ability to meet the growing demand of capital and labour within the productive environment (López Gálvez & Naredo, 1996; López Gálvez et al. 2000; Delgado Cabezas et al. 2015; Delgado & Aragón, 2006). Fast growth and intensification mentalities have led to a lack of social and economic sustainability, with labour relations shaped by socioeconomic and ethnic inequalities (Martínez Veiga, 2001; Martín Díaz & Rodríguez, 1999). Additionally, families face a crisis of profitability. The low net margins indicate that farmers obtain income residually as a family in the absence of regular individualised salaries.

"The increase of the cultivated area, the search for market niches (such as the cultivation of special varieties), the intensification of production in new greenhouses, the increasing use of inputs in order to obtain a greater output and control of the production process, as well as the intensification of production based on wage labour, are clear evidence of the assumption of the main features of industrialized agriculture, as typified by Van der Ploeg (2008). This active response to face the crisis, contradictorily, reproduces and expands it as it consolidates the trend of decreasing prices and increasing costs experienced by intensive agriculture in Almería." (Soler Montiel, et al. 2017:246).

Soler Montiel et al. reveal how the institutional positivism towards Almería's family farming model, present in Cajamar's report, fails to address the impact on the family unit of the social, environmental and economic inequalities within the agricultural chain. Their study shows farmers are not only aware of, but also able to negotiate the discrepancy in monetary flows between disposable income (money available for expenditure by the family) and net margin (remuneration of family labour once

investments and total production costs have been subtracted). In many cases, such negotiation involves using the disposable income for both family needs and credit payments without profit margins, leading to a temporary decapitalisation and indebtedness (Soler Montiel, et al. 2017:245). The fluctuating prices over the year and the never-ending juggling of accounts also contribute to a situation in which it is typical to balance the books at no more than subsistence level over the course of the harvests. This negotiation of financial pressures is often at the expense of the family farm and its non-scalable factors like conscious technological adoption, familiar associationism and the close relation between farmers and the natural world.

As Tsing argues, “the articulation between scalable accounting and non-scalable workplace relations is increasingly accepted as a model for capitalist accumulation” (Tsing, 2015:42). This implies there is a constant reformulation and negotiation of industrial features by the family unit, as well as a constant mediation of industry in the structure of the family. In a visible sense, neither the terrain nor the family farmers have allowed western Almería to become dominated by single owner, monocrop American style plantations. Farming in the region continues to be characterised by smallholder production, as farmers precariously resist and adapt to the growing exigencies of the intensive project. Yet, non-scalable workplace relations are continuously reconfigured according to the needs of the agricultural cluster. In this sense, the intensive agricultural model makes use of the idealised image of family farming to legitimise the industrial project. However, it is this very appropriation that is impairing the generational uptake, making it clear for the younger population that their region’s traditions will disappear if they continue to be embedded in the agro-industrial project (Pérez-Vitoria, 2005; Mendras 1984).

Conclusion

The oligopsony enforced by the few large supermarket chains and the oligopoly of input and seed producers are crucial markers of the dependency of small contract

farmers and of the hegemonic control of overseas companies over the commodity chain. Such dependency is instrumentalized through price fluctuations and certification standards. In the case of western Almería, the consistent lack of protection for farmers and agricultural labourers by the state – including the standardization of precarious contracts across the agricultural industry – has led to the normalization of the reduction of labour costs and the intensification of labour to maximize profits and meet production standards. As Narotzky argues, “certification standards are often the instrument of smallholders’ dependency” (2016: 308). These are the set of rules in terms of shape, appearance, colour, composition and chemical residues that farmers need to comply with to sell their produce to large European supermarkets. Some of these rules are derived from the European regulation, others relate to taste, size and aesthetics and are imposed by the supermarkets. These rules create smallholders’ dependency because they set the conditions of production, while transferring the risk of production to farmers, who are forced to work and farm intensively to have a commercially competitive harvest (Dolan, 2004). The quality of produce is established by the cooperatives and distribution centres that hire third party certification companies to assess production and divide the quality of vegetables accordingly.

Family farms in western Almería have experienced different forms of contract agriculture, including fixed-price contracts of grape in the 1920s and contracts with the National Colonization Institute from the 1950s to the 1980s. Since the 1980s, contract agriculture has been practiced by cooperatives for niche variety products and by supermarket chains that seek producer exclusivity. There are also membership contracts for cooperatives and auction centres. The large concentration of distribution centres within the industrial cluster gives an appearance of choice regarding the terms of the contracts family farms can enter into, expressed as the autonomy and bargaining power of farmers. Yet, as Susana Narotzky suggests, “the liberal moral economy of apparent autonomy and choice” serves to divert attention from the input dependence, financial indebtedness, self-exploitation and lack of space for negotiation (2016: 307). In addition to the climate and biological risks of production, family farms

endure as part of their contractual obligations. Small contract farmers will be in a better position to negotiate when many export firms are competing to buy product in spot markets (Jaffe, 1994).

Sessions argues that having an industrial farming job “is to “choose” environmental destruction as a “natural” course of events” (1997:185). However, the lifeworlds of farmers I encountered in Almería, like Ángeles, Lola and ‘Las Isabeles’, tell a different story. While farmers around them have been absorbed by the industry’s technological reforms and output demands, they have negotiated these gradually, adapting their traditional agricultural practices and collegial relations to the current demands of the market. For them, nature is not simply a resource base, as defined by the industrial model. They have a vast knowledge of the natural world and the ecological interactions that exist within the greenhouses. This knowledge has allowed them to overcome the technological and financial obstacles they have experienced throughout their engagement with the industry, and to maintain a moral standing and develop their own possibilities as farmers (Palmer, 1990).

In its hierarchy of knowledge, the industry situates women’s knowledge in an inferior sphere, undermining their contribution to the sustenance of ecosystems, the preservation of non-scalable production values and the education of younger generations (McGaw, 1989). The marginalisation of non-scalable factors of family farming is unsustainable for the industry and for family farms. However, as the ethnography shows, in between the promoted unsustainable practices, farmers and workers (especially women) are resisting and remodelling their intergenerational practices to negotiate the economic and social pressures of intensive farming.

The continuation of the industrial model also disproportionately affects the health of women and of ecosystems. Toxic chemicals persistently filter into the soil, penetrate plant tissue and bioaccumulate (Warren, 1997). In humans, chemicals (including pesticides) accumulate in a woman’s breasts and are fed to babies in utero via the placenta and later via the breastmilk (Fernandez et al. 2007; García-Rodríguez et al.

1996). One of my informants asked me, “if the results are here, both in terms of soil health and human health, why don’t we do something?” The ecological and human impact of intensive agriculture shows that it is a model realised at the expense of the system’s ‘others’ - women, children, the elderly, migrants and non-humans. Yet, within the system, the ‘others’ adapt and resist, as I have shown in this chapter through local testimonies. Paying attention to non-scalable factors can help anthropologists to locate both practical and intangible traditional knowledge and meanings, in order to promote a change in policy and agricultural business culture.

Chapter 2

'Es Lo Que Hay': Public Secrets and Normalized Inequalities in Workers' Everyday Life

Introduction

With the example of family farming, it was shown in the previous chapter that the agricultural industry is more than “a single integrated exchange environment” (Hewitt de Alcántara, 1992:7). This chapter expands on the forms of labour oppression that prevent the preservation of the non-scalable values of family farming. Specifically, it will explore the different public secrets that underlie the industrial agricultural structure and affect workers. Public secrets are understood as generally known facts that cannot be easily articulated (Taussig, 1999:51). Earning below minimum wage, paying your own welfare or being publicly shamed and discriminated on the grounds of ethnicity or gender, is now part of Almería's everyday agricultural life, even if few are talking about it publicly. The positivist commercial image of the industry not only means that people's stories remain unheard and their conditions invisible, but it also forces upon workers a strategic use of silence, which confines public secrets locally.

This chapter explores public secrets and the individual strategies used to combat them. When everyday resistances and individual survival strategies are performed single-handedly, the targeted forms of oppression remain hidden yet accepted, because they come to be seen as isolated, individualised cases. I argue that these resistances are the mechanisms by which public secrets are born, and the proliferation of the latter both impairs workers' movements and leads to the normalisation of the very inequalities that were being challenged. On the contrary, voicing a public secret can shift power relations in favour of workers and also procure

space for individual strategies to bypass a given problem within the industry. The ordinary is challenged as local inhabitants modify the categorical identities imposed by the system, and they do this by giving voice to that which they have concealed. In one motion, this act removes a negative by breaking a humiliating silence, and introduces a positive by rendering one's life and experience visible.

Analysing workers' roles in the production network and their experience of its associated inequalities has the potential to bring consumers closer to the unequal relationships imprinted on the vegetables we consume. This can help expose the way in which the industrial labour structure is "embedded in political processes, social institutions and political images at the local or regional level" (Gould & von Oppen, 1994:6). Addressing Wendell Berry's query, "If human values are removed from production, how can they be preserved in consumption?" (Berry, 1977:79; Spector 2002:302), this chapter challenges what Michael Pollan refers to as 'storied food' or "supermarket pastoral", an attractive literary form put forward by manufacturers and retailers to show how their product meets consumers' production expectations (Pollan, 2006:134). However, the people who actually handled the produce, along with the effects that production has had on their lifeworlds, are hidden from consumers by the industry itself. What is bad for the industry is believed to be bad for its workers, and therefore, if identified by his or her peers, any mention of the industry not functioning is enough to get a worker fired, or worse, added to the company's blacklist.

As Appadurai makes clear, consumption is "eminently social, relational and active" (Appadurai, 1986:29). Consequently, markets exist within the boundaries of what is determined as socially accepted behaviour (Vaughan, 1996:61). The boundaries between the market's accepted and unaccepted behaviours point to a "plurality of oppressions", but it is the social consensus that determines which types of oppression can be shown, and which types must be hidden (Bradhan, 1993). The consensus reveals how "constitutive relationships" shape one's actions beyond self-interest, while the acceptance of or rebellion against certain consensual boundaries can denote

our frictions with others, constituting a shift from 'ordinary' behaviour (Englund, 1999:142; Parfit, 1984; Mosko, 1992).

This chapter builds on existing literature by ethnographically exploring workers' frictions with social consensus, and the way in which they are articulated through the collective exposure of public secrets. The ethnographic attention to social consensus is revealing of the self as a multipart actor in the construction of the politics of production and consumption. The challenge lies in deconstructing the social components that generate adaptability and/or resistance to the consensus (Riesman, 1986; Wagner, 1992). Through negotiation with others, we arrive at a consensus on questions about how we see the world, what we deem real (manifest world), and what we choose to hide (what we know is real but is not apparent in the manifest world) (Simmel, 1964:330). Exploring the exchanges between the manifest and the secret, as the secret is formed and revealed, shows how associating with those around us influences our worldview and social position.

The first section focuses on the evolution of inequalities and labour mobilization in Western Almería. The second section explores how the public secret is constituted through social interaction in the production environment, and how workers' interiority is negotiated given the imposition of concealment with respect to certain topics. The second section focuses on the moment of revelation and the social effect of unmasking the "secretly familiar". Each section will feature anonymous statements by the workers who informed this research. Their identities are not revealed due to the sensitivity of their statements.

Inequalities and labour mobilization in Western Almería

The development of the associative and commercial culture of western Almería began at the end of the 60s, when the first commercializing horticulture cooperatives were organized in the region. Previous grape farmers formed some of these cooperatives,

however, this new cooperativism marked the divergence between the “old agriculture, controlled by local elites and foreign intermediaries” and represented by grape businesses, and the new agriculture “promoted by young farmers and peasant families who had emigrated to the coast of Almeria and the closest inland regions”, represented by intensive greenhouse horticulture (Marzo López, 2008: 17).

Until the 70s commercialization depended on the regulation of the Francoist Vertical Union (Sindicato Vertical), including the Fruits Union (Sindicato de Frutos), whose main role was to regulate prices and quotas, and the Colonisation Union Groups (Grupos Sindicales de Colonización), responsible for organizing the collection and sale of vegetables for farmers and developing water wells, as part of the agricultural development plan of the National Colonization Institute (Ferrer Gálvez, 2021). Both unions operated locally through the Local Brotherhoods of Farmers (Hermandades Locales de Labradores y Ganaderos) and were organized in parallel to the programs of regional agencies of agrarian extension (Extension Agraria), who played a significant role in the training of farmers and rural workers. The Colonisation Union Groups became the current ‘societies of agrarian transformation’ (Sociedad de Transformación Agraria, SATs) and have occupied the same role as cooperatives. Both cooperatives and the SATs were represented by the Territorial Union of Cooperatives of the Field of Almería (UTECA-Almería), constituted in 1958, under the Cooperatives Law of 1942, to offer advice and help with the sales of cooperatives.

It is significant that after the Law of Associations of Spain of 1964, El Ejido already had the Association of Housewives of Virgen del Carmen and the Association of Neighbors of El Ejido (Asociación de Amas de Casa Virgen del Carmen y la Asociación de Vecinos de El Ejido). The Association of Housewives of Virgen del Carmen was the first associative movement in the region and had many projects, including planting the first trees in the municipality, installing light points in the street, organizing festivities and most importantly the creation of the labour social centre with a nursery where parents could take their children during working hours (Doucet Plaza, 2009). The association understood the work-life balance conflict for mother-farmers in the region

and public officials and organizations have “recognized their work” (Doucet Plaza, 2009: 495). The role of the association was more social than political, but it is significant how women got organized to solve the first labour struggles, before any of the current representatives of the industry.

During the 1960s and 1970s, farmers relied mostly on local *alhóndigas* (produce auction markets) and Mercoalmería (the provincial auction market), to sell their produce. The *alhóndigas* represented a solution for farmers because they could deliver their produce in the local warehouses with a guarantee of payment from the *alhóndiga*. Farmers had little bargaining power on the prices and terms of the auction, but they could check the prices at each *alhóndiga* and sell where they saw fit. Initially, the *alhóndigas* also had a financial function to attract farmers and assure their volume of produce, whereby they lent credit and inputs to farmers, in exchange of the farmers’ commitment to sell their produce in their auction.

Mercoalmería was the provincial market of agricultural products of Almería, financed by the provincial government, the state market company Mercosa and the Rural Credit Bank (Caja Rural de Almería). Mercoalmería had a significant role for farmers, as it allowed for direct sale at the home market without depending on intermediaries, having information about prices in the home and foreign markets, legal advice on contracts, security of payment and quality control. Mercoalmería also had a significant role for cooperatives, as it created a social awareness on the importance of an organized commercialization for farmers and actively helped in the initial organization and development of some of the local cooperatives, which had a minimal role until mid 1970s due to the low concentration of volume. The need for representation in combination with the technical and commercial advice from Uteco, the financial support to farmers from the Rural Credit Bank (Caja Rural de Almería) and administrative subsidies as part of the renewal of the Spanish trade policy, led the existing cooperatives to swiftly become recognized as associations of organizations of producers (Asociaciones de organizaciones de productores, AOPs, later known as

Fruit and Vegetable Producer Organizations, Organizaciones de Productores de Frutas y Hortalizas, OPFHs), allowing them to consolidate as exporters (Gómez Benito, 2001).

By 1975, cooperatives began their export activity with the French market of Saint Charles in Perpignan and a movement in defence of producers' rights started emerging to improve farmers' bargaining position in the international market. In 1977, twenty-four of the regional commercializing companies specialized in tomatoes and cucumbers, including the AOPs (cooperatives and SATs), Mercoalmería and individual companies and farmers, founded the Provincial Association of Harvesters-Exporters of Horticultural Products of Almería (Asociación Provincial de Empresarios Cosecheros-Exportadores de Productos Hortícolas de Almería, Coexphal). Coexphal became one of the main mediators between the state and horticulture cooperatives, operating as a second-grade cooperative. However, it did not operate under the cooperative principle, as its members had a weighted vote in relation to their volume of export. Initially it had an activist character, mediating against the attacks on Spanish trucks by French farmers in the Perpignan border, due to the competition for the tomato market. They also worked closely with UTECO to obtain higher production quotas for winter tomato and cucumber produce from the Fruits Union. This took place at the end of the 70s, marking the end to the 'tomato wars' between Almería and the Canary Islands after years of competition over tomato production quotas.

However, Coexphal was not alone in the representation of regional agriculture. Once the Law, 19/1977 (BOE, 1977) regulating worker's rights to unionise was approved, numerous unions with various political orientations were founded, competing to consolidate as the farmers' representatives at the national level. This was a result of the disappearance of the Francoist Vertical Union and the emergence of regional associations of farmers and exporters to negotiate and self-regulate their collective position in the market (Herrera González de Molina, 2007). Other Francoist agrarian organizations survived the social transformation in Almería in the 70s with few internal reforms. Some of these organizations, such as the fund regulating agricultural products, Fondo de Ordenación y Regulación de Productos Agrícolas (FORPA),

continued to exist after the transition to democracy. Yet, their role and social acceptance diminished with the pressure exerted by farmers through “democratic labour unions represented by the different professional agrarian organisations” (Ferrer Gálvez, 2021: 25).

These democratic agricultural unions, later known as Professional Agricultural Organizations (Organizaciones Profesionales Agrarias, OPAs), can be divided between conservative and progressive. The conservative leaning unions were the National Centre of Young Farmers (Centro Nacional de Jóvenes Agricultores, CNJA) and the National Confederation of Agriculture and Livestock Farmers (Confederación Nacional de Agricultores y Ganaderos, CNAG). The CNJA defended the interest of small and middle size farmers and was associated with the right-wing parties Unión de Centro Democrático (UCD) and Alianza Popular (AP), while CNAG represented large landowners and was associated with Franco’s regime and its vertical unionism. CNJA and CNAG later merged with the Union of Agrarian Federations of Spain (Unión de Federaciones Agrarias de España, UFADE), creating ASAJA one of the most important OPAs today. On the progressive side there were, the Coordinator of Organizations of agriculture and livestock farmers (Coordinadora de Organizaciones de Agricultores y Ganaderos, COAG) and the Federation of Workers of the Land (Federación de Trabajadores de la Tierra, FTT), the agricultural branch of the socialist General Workers Union, (Union General de Trabajadores, UGT), which later became known as the Union of Small Farmers (Unión de Pequeños Agricultores, UPA).

COAG defended the interests of small family farmers on the national level, with tight links to the Communist Party. On the local level, COAG was represented by the Union of agriculture and livestock farmers of Almería (la Unión de Agricultores y Ganaderos de Almería, UAGAL). The FTT was traditionally socialist and represented family farms and labourers (*Jornaleros*) (Herrera González de Molina, 2004). On a national level, COAG had a critical role, together with FTT, in the elections to the agricultural chambers (Camaras Agrarias) in 1978. They claimed the right-wing party UCD was financing independent candidates to control the growth of progressive unions like

COAG in rural Spain, yet they presented themselves and lost to independent candidates in most regions. The Institute of Agrarian Reform confirmed the support of independent candidates in Almería by UCD and the civil governor of Almería, which resulted in a majority of conservatives in the chamber (Moyano Estrada, 1984: 271). However, the chambers represented only a portion of the mediation with the state and were not fully recognized by farmers, especially in regions like western Almería, where only 16.5% of the census voted (Navarro Pérez, 2017; 2009).

COAG fought against unfair state price policies and had a dominant role in the truck protests and peasant wars, including the tomato and cucumber wars in Almería (Ferrer Gálvez, 2018). This allowed UAGAL to increase its power in the region, focusing on the creation of a productive fabric and the problems with quotas and input prices (Ferrer Gálvez, 2017). They worked collaboratively with other OPAs (CNJA and FTT), AOPs, Coexphal, Mercoalmería and members of the Communist Party and PSOE to develop a report with farmers' demands, in 1978, to present to the commission for the export of fresh winter tomatoes and winter cucumber, created by the Ministry of Commerce (BOE, 1978). Coexphal and the OPAs represented Almería in these national commissions, with the objective of regulating the vegetable supply to the European Economic Community and negotiating the regional export quotas set by the Common organisation of agricultural markets (CMO) to avoid internal competition and prevent prices from falling, acting, as Marzo López suggests, as a "exporters cartel" (2008: 26).

They continued this line of work by signing a collective agreement in 1979, demanding the rise of horticulture quotas and a social platform to negotiate the terms of quotas with the central state, as well as a research group on horticulture production, once the tomato quotas were obtained. Furthermore, in 1981, UAGAL, Coexphal and Workers Commissions (Comisiones Obreras, CCOO del campo, a union closely associated with UAGAL and the Communist Party) developed the collective labour agreement for agricultural workers, seeking to regulate prices and workers' salaries (Sabio Alcutén, 2006). 1981 was a significant year in the region because the

municipality of El Ejido was created as a segregation of the municipality of Dalías. The division took place after a period of civil mobilizations and a long administrative process organized by the neighbourhood association of El Ejido with the support of the neighbourhood associations of Balerma, San Agustín and Santa María del Águila, the cooperative Frusol, the irrigation association of El Ejido and the local schools (Doucet Plaza, 2009:498). The rise of citizen participation through the neighbourhood association and the development of the union structure provided a significant change for the organization of farmers and workers in the region, who finally counted with administrative independence, political representation in the regional and national levels, and most importantly a recognition of their labour rights with direct effects on their salaries and working conditions.

Yet, the 1981 labour agreement was criticized for not being representative by the more conservative OPAs, who had an aggressive strategy based on a general opposition against the proposals of progressive agricultural institutions (Cabana Iglesia and Lanero Táboas, 2009). Some examples of this opposition were the justification of the violent actions of young farmers in the border with France, the boycott of French produce, the administrative obstacles they promoted throughout the development of the labour agreement and the general opposition to UAGALs' vision of collaborative development. Another example was the critique of the prohibition to extract sand from the regional beaches for regional farming due to over-exploitation of the ex-delegate of CNJA López Tarifa, representing the right-wing party, Alianza Popular. This was articulated through a strike of farmers and truck drivers in October 1983 that was not supported by the CNJA as this measure had been agreed by all agricultural entities (Ferrer Gálvez, 2019: 60). Yet, the pressure exerted by the CNJA, led to the creation of a commission to make an analysis of the new sites for extractions inland and a regulation for sand extraction (Viciano Martín-Lage, 1999; Ferrer Gálvez, 2021).

As the major agricultural conflicts of the region started to be solved, the OPAs encountered a decrease in the number of farmers who subscribed to each union,

affecting the amount of funding they received from the public administration. This involved, as Ferrer Gálvez suggests, the 'free-raider' problem, "which encourages non-affiliation, since the non-affiliated also benefited from union conquests" (2019:62). This led the OPAs, to diminish their role as vocals and activists in favour of other services that were more attractive for its members, due to their dependence on state funding. These services included, production assurances, input provision, fiscal advise and agricultural training.

In the case of Coexphal, in 1986, once the problem of quotas was solved, a group of *alhóndigas* of Coexphal created the Professional Association of Alhondiguista Entrepreneurs of the Province of Almería, which in 1993 changed its name to the Federations of Associations of Commercializing Horticultural Entrepreneurs (Federación Andaluza de Asociaciones de Empresarios Comercializadores Hortofrutícolas, Ecohal). Likewise, in 1988, a group of cooperatives that had been founding members of Coexphal created the Provincial Association of Agricultural Associations of Almería (Asociación Provincial de Agrupaciones Agrarias de Almería, Apal). This was significant because it brought an end to the monopoly of representation of Coexphal, with a significant reduction to its membership. It also marked the differentiation of the dual sales model of the region and their representation, with cooperatives selling to foreign markets being represented by Coexphal and other organizations like Apal, and *alhóndigas* with direct sales in the regional warehouses being represented by Ecohal. In this process, as Marzo López suggests, Coexphal, like the OPAs, undertook a process of transformation from an entity that raises demands and defends producers' rights to "a company that provides services for its associates" (2008: 30).

The decade of the 90s was characterized by the expansion and intensification of production, which made family farms dependent on hired labour; predominantly male migrants coming from Morocco, but also including sub-Saharan African, eastern European and Latin American migrants. By the end of the 1990s it was estimated that the region depended on the labour of "15,750 workers outside the family unit"

(Martínez Veiga, 2001b:43). The absence of integration and housing policies by the Popular Party administration, ruling in El Ejido since 1991, led to the segregation of migrants and development of the ethnic conflict in the region (Checa, 2001; Martínez Veiga, 2001, 2014; Potot, 2008). As Ubaldo Martínez Veiga suggests, this marked the change from “a community open to the arrival of native immigrants who quickly integrate into it and become owners with a certain speed, and absolutely closed, especially after this date, to integration through property ownership, of foreign immigrants” (2001b: 41-42). This followed a common pattern of small farmer’s dependence on migrant labour in southern European agriculture, leading to the development and normalization of different levels of exploitation based on legal status, nationality, gender and recruitment (Corrado and De Castro, 2017; Reigada, 2012; Corrado and Perrotta, 2012; Potot, 2010). This differentiation, as Berlan argued, has maintained labour cheap and vulnerable overtime (Berlan, 1986). This has been guaranteed by the ‘rotación interparcelaria’ (rotation between farms) that makes labour appear easily substituted and by ‘productive disintegration’, whereby labour become externalized and precarious (Martínez Veiga, 2001b: 49).

The OPAs positioned themselves in defence of farmers. Even the more progressive ones, like COAG and Coexphal, considered the labour inspections as a “persecution” against farmers, imposing heavy fines on those who hired undocumented migrants, when the administration knew farmers depended on their labour (Checa, 2001: 28). They also justified the reliance of regional farmers on informal labour arrangements because of the “high deficit of waged labourers” and the slow administrative process to obtain their residency and work permits for undocumented workers (Martínez Veiga, 2001b: 43). As Martínez Veiga notes, this position was accentuated after the violent outbursts of farmers against migrant labourers in February 2000, when both organizations denied the deficit of labourers and opposed the “masses of undocumented migrants” serving as “a breeding ground for crime” (Martínez Veiga quoting representatives of COAG and Coexphal, 2001b: 45). CCOO and UGT, also suggested the labour pool needed to be reconfigured so that the “supply of labour would match the demand” (Martínez Veiga, 2001b: 46). Through this process the

OPAs and the interprofessional organizations singled out the conflict as social, framing it as a problem of social cohesion and housing, rather than recognizing it as a labour problem based on the normalized non-compliance with the labour agreement they had collaboratively designed.

The 2000s were significant because as the ethnic tension arose, migrant workers also acknowledged the impact they could have in the regional agriculture through labour organization and strikes (Checa, 2001:34). These started as a result of the violent outbursts in El Ejido and were supported by the Association of Progressive Women of El Ejido, Almería Acoge and the Association of Moroccan Immigrant Workers in Spain (Asociación de Trabajadores Inmigrantes Marroquíes en España, ATIME). As a result of the strikes, they managed to sign an agreement between Asempal, UGT, CCOO, Almería Acoge, ASAJA, COAG, Ecohal, la Asociación El Whada, ATIME and the Coordinator of Migrants of El Ejido that demanded urgent housing solutions, the regularization of migrant workers, the fulfilment of the labour agreement, social housing, an integration program and an investigation of the events (Checa, 2001:57). By the end of February 2000, 40 housing modules were installed next to the greenhouses and there was a proposal for a regularization plan, yet the other measures have not been accomplished until today. It is significant that the peak of ethnic violence and migrant workers strikes was reproduced in Italy and France during the following decade (Décosse, 2011; Corrado, 2011).

In Almería, the tendency towards a “service union” of CCOO and UGT has allowed them to function as a semi-public entity, giving administrative guidance, but ineffective in promoting union activism (Caruso, 2016:281). CCOO has positioned itself against racism and in favour of fixed-discontinued contracts over the usual temporary contracts (Villegas Martínez, 2001a; Martínez Veiga, 2001b). Yet, peasant unionism emerged through the work of the Land Workers’ Union (Sindicato Obrero del Campo, SOC, which later became the Andalusian Workers Union, SAT-SOC) that had been developing across Andalusia and started growing in Almería since early 2000. SAT- SOC has positioned itself in alignment with La Via Campesina, against the

system of hiring workers in their home countries through temporary labour companies, the false classification of migrants as temporary labourers and the semi-slavery working conditions. They have done so through union activism, including peaceful land occupation, strikes, negotiations and by supporting the legal claims of migrant labourers. They have also confronted large agricultural companies with exploitative labour practices and exposed them to European consumers through activist campaigns (Caruso, 2016:286).

In an interview for this research, one of the oldest representatives of SAT-SOC in El Ejido, the Senegalese Spitou Mendy, explained the work in the union has been one of social mediation, “explaining to the people, to the workers, in the towns where they live, in the cafes where they meet, how to generate a community and how to transform the labour relations”. He claimed this task of social mediation has been complicated because as an alternative union they do not have financial support from the state and are not considered a valid representative along other unions. Furthermore, he argued the lack of union culture among labourers and the language barriers have been meaningful obstacles. Yet, this has only encouraged them to continue making information campaigns in Spain and in Europe, in the European Parliament, to show the basic logic underlying Almería's agriculture, the lack of compliance with the agriculture labour agreement (Convenio del Campo), signed by all unions, the state and interprofessional associations.

Spitou: We have served as an example. Nobody talked about this here, but someone had to accompany the working class that had come into the area. We have more complaints in the labour inspection and in the courts of Almería than CCOO and UGT combined. What is the cause of that? If we want this independence, we don't have to depend on state money, on state subsidies, because you can't go against the will of the person who feeds you. We are trying to say that the worker does not have enough and that it is an aberration that someone who works every day does not have enough to support himself. People have to know that the Convenio del Campo is not

respected here. Farmers have the power to pay their workers 46 Euros, instead of 32 per day, as it is normally the case. There are some cooperatives that will pay 40, 42 Euros, but they never reach 46 as it says in the labour agreement. The corporations and the agrarian unions have discussed this with the labour unions. But I have never sat down at a negotiating table because I am an alternative union, a small union, a small section in a small province. But we have a voice. We defend the working class. And we upset them because of that.

The mission of the SAT-SOC has been one of trying to unite the struggles of labourers and small farmers. One of the Moroccan activists at the union, representing the largest community of migrants in the region, explained:

In agriculture, there has been no evolution, the companies in the region are still doing the same irregularities that were being done before: non-payment of wages, irregular payments of the social security quotas, lack of labour risk and safety prevention measures, and fraudulent labour contracts. There is a universal reality, if you as an employer pay your workers well, motivation is at its peak, they perform better, they do more. But those who do not want to see that, will remain the same. These are also families, small families that don't have enough to be entrepreneurs. They take advantage of the worker to be able to make ends meet. We know that and want to defend them, but if they don't want to talk to us. I have always supported small farmers; I have understood them. My approach is to talk to them, to accompany them, to help the state understand that the subsidies have to go to these farmers. The achievements of the union depend on the will of the people you give advice to, if the worker does not want to, you cannot, if he does not dare to approach the courts, you cannot, if he does not agree to sign the power of attorney, you cannot. We have a labour lawyer who is always on hand to accompany us, but we have an advisor, a labour advisor at the union who is in charge of collecting the complaints of

the workers. We formulate the complaint, carrying out a mediation process with the Labor Inspection and then we go to the courts. If the farmer pays what has been agreed, there's no problem, but if he doesn't pay, we go to court and every time we've done it, we won the case, even when the workers were undocumented immigrants.

These testimonies show the underlying logic of the present social mobilization in the region. On one side there is a lack of representation of labourers by mayor labour unions like UGGT and CCOO due to the internal politics of these organizations, which position themselves in alliance with interprofessional agricultural representatives in favour of farmers and agricultural businessmen. Consequently, there is a lack of engagement of farmers with unions that actively defend labourers, like SAT-SOC, as they prefer to be represented by the unions with traditional alliances with the regional agricultural industry. On the other side, there is a lack of engagement of labourers in precarious conditions with the unions. This takes place for several reasons, including lack of information, acceptance of precarious conditions, fear of unemployment, fear of association, lack of trust in the ability of unions to represent them and fear of repercussions of taking union actions. These are logical claims and are exercised as a form of power to prevent collective action by the labourers. In an interview for this research, the union lawyer of SAT-SOC, Laura Góngora argued “this is due to a lack of consciousness of workers that their only form of power to improve their conditions is to stay united, because individual complaints lead to dismissal, while collective complaints lead to improving working conditions”.

The general acceptance of a degree of exploitation in the industry, make workers search for the least exploitative companies, yet there is a general disbelief that union action will lead to any tangible solution. This is due to a general distrust of the ability of traditional labour unions like UGT and CCOO, since their union delegates often negotiate solution under the control of the company's management, without previously holding workers' assemblies to discuss their demands. This results in managerial solutions, because the union delegates only transmit workers' complaint to

the legal team of the union, offering individual advice to workers, but not a structure of support or collective mobilization. This affects all workers, including farmers and labourers, creating a general feeling of apathy among workers, due to the lack of solutions provided by traditional unions. It also leads the most vulnerable farmers, involved in processes of eviction or financial debt that require urgent union action, to turn to SAT-SOC to represent them. The necessity of mobilization was very clear for Laura, she claimed “when there is a problem, you have to mobilize all the company's workers and make them aware that the only way to change this situation is with mobilization and for the company to see that everyone is there”. For her, unions should not just solve problems for its members, but mobilize of the labour force so that there are collective improvements in the sector.

The appearance of SAT-SOC in 2005 has been pivotal in activating the mobilization culture among workers. This is not to say there were not previous mobilizations in the region. There have been and continue to be multiple mobilizations every year to claim fairer prices for farmers, to protest against the sales under production costs and to give preference to Spanish produce over foreign imports, especially from Morocco. These mobilizations have showed farmers entrepreneurial demands and are supported and sometimes organized by interprofessional associations, like Coexphal, agricultural unions, like COAG or Ecohal and larger farmers' associations, like Asaja or UPA. However, farmers' mobilizations have for long depended on the organizational dynamics and social reach of the associative tissue of farmers in the region. Larger unions have relied on the work of small associations created to attain specific demands, like the neighbour's association of El Ejido advocating for the independence of El Ejido from Dalías in 1982. This has also been the trend of newly created associations like Alive Agriculture in Action (Agricultura Viva en Acción, AVA), created in 2016, and the Association for the Defence of Almería's Farmers (Asociación para la Defensa de los Agricultores Almerienses, ADAA), created in 2017. These associations were formed by farmers with ties to cooperatives such as Campojido or Casi, and have intended to improve the bargaining position of farmers within the industry, to

promote Spanish agriculture, monitor market competition and improve the position of Almerian produce in the market.

These associations are characterized by a strong feeling of misrepresentation and an active use of social media, predominantly Whatsapp groups, through which farmers engage with each other and voice their opinions about the industry. This has been also the case of The Union of Independent Farmers (La Unión de Agricultores Independientes, UAI), created in 2019. This association was created by young farmer after posting a viral video cutting his plantation and denouncing the low prices making him throw his produce away. Calling himself the “Che Guevara of the fields”, he became the main promoter of farmers mobilizations through social networks, summing up to the demands of the Yellow Vests in France and the pre-covid farmers’ protests in Spain. However, within a year he left the organization for not having met his demands. This has also been a dominant trait of these associations, the rapid turnover of leaders and the frustration among organizers and associated farmers, derived from the lack of impact of the associations. Nonetheless, their work has led to a rise in mobilizations since 2014 that become more frequent every year and are supported by most agricultural companies and organizations, including the collective dumping of produce and the tractor parades from rural areas to the main cities to demand fair payments to farmers.

While these mobilizations served to unite farmers, their financial and political demands, tend to ignore labour issues. Nonetheless, the price crisis has a clear effect in the labour conditions of farmers, who have been chronically exposed to price vulnerability and organized against it for over 15 years. The existence of mobilizations shows this problem is not isolated or temporary. However, while the existence of the price crisis is acknowledged, what is not acknowledge is the long-term inaction of the representatives of the industry, and the long-term self-exploitation of farmers and exploitation of hired workers needed to sustain the agricultural activity through a long-term crisis. This leads to a continued treatment of the problem from the financial angle and the perpetuation of the social problems derived from the price crisis. One of

the effects that has been observed is the exit of women from the farm activities, seeking stable salaries as packaging workers in the greenhouses. This placed women in the centre of the industrial machinery, downgrading their social position from farmers to mechanical workers, being subject to low payment, intensive mechanical movements and long continued journeys with few short breaks.

The lack of influence of union delegates from CCOO and UGT representing workers in the distribution centres, led to the creation in 2018 of the Coloured Gloves association (Asociación Guantes de Colores). This association, representing the rights of female packaging workers, emerged from the S.O.S. Female Horticulture Packaging Workers Facebook group (S.O.S. Envasadoras Hortofrutícolas de Almería). Their work was pivotal to show that the food processing labour agreement of 2016 was not being met in the regional packaging sector and most importantly to engage the large community of invisibilized female packaging workers serving as a safe space to voice their concerns.

Some of their members were key negotiators of the strike of the packing sector in 24-26 December 2020, as labour delegates of UGT and CCOO in the regional companies. The strike emerged out of the failed negotiation between Coexphal, UGT and CCOO to renew the labour agreement for the packing sector, which was expired since 2018. After months of negotiations, Coexphal considered the sector demands inadmissible, leading the unions representatives to mobilize workers as they had done in 2012 and 2016. Yet, this time the strike was supported by the SOS envasadoras platform and the Guantes de Colores association, allowing for a strong mobilization. Their demands, which were also supported by SAT-SOC and the National Labor Confederation (Confederación Nacional del Trabajo, CNT-Adra), included: fixed or discontinuous-fixed contracts, salaries 5% above the minimum salary, a working week of 35 hours, payment of overtime work at 11 Euros the hour, work-life balance, a transport plus, a seniority plus, the payment of holidays, paid 20 minutes rest periods, retirement plans at 60 years of age and basic safety measures to protect workers against Covid-19 and

the recognition of occupational diseases, like chronic wrist sprains, which are not currently recognized.

However, the agreement signed the 24th of September of 2021, through the mediation of the Extrajudicial System for the Resolution of Labor Conflicts in Andalusia (Sistema Extrajudicial de Resolución de Conflictos Laborales en Andalucía, SERCLA) (BOJA, 1996), followed the same pattern of the 2012 and 2016 agreements, whereby companies agreed to comply with the national regulations of minimum salary, holiday pay and work-life balance, without meeting any additional demands made by the workers. In practice, this meant a maximum weekly shift of 48 hours (9 hours a day with no cap on overtime hours), modest wage increases of 2.6% (7.30 euros the hour, 1% over the national minimum salary, with 1% increase every year and without the possibility of review salaries in three years), and a differentiated hourly wage according to normal working hours, complementary hours, extra hours and night shift (CNT Adra, 2021; García, 2022). This meant an increased reduction of workers' rights, increasing the weekly shift by 5 hours, salary rises below the consumer price index and added complexity to the hourly calculation that workers perceive in their detriment. As one of the research informants claimed, “the companies fill the hours as they see fit and we have hard time calculating what we are owed”. The requirement to sign fixed-discontinuous contracts for 60% of the staff in the packaging centres is also considered to the detriment of temporary workers, who are let go after six months and of fixed-discontinuous workers because they become tied to a single company. Other issues like, the 20-minute break time every four hours of work, remain unresolved and in many cases, workers continue to be obliged to recover the time of the breaks at the end of their shift.

Workers felt powerless after their engagement with strike and blamed the unions for their weak negotiations with Coexphal, with comments like “really???? Are you going to sign this??? Then you ask us to trust unions”. The union representatives also blamed the workers for their low engagement in the strike and thereafter, weakening

their collective bargaining position. One of the platforms' leaders informing this research claimed,

“The local media will never publish news about the labour struggles or the breaches in the labour agreement because it seems that it is so common that it is not news, we need to continue to fight united, especially those that complain about the labour agreement, because things will only change if we are able to mobilize in four years when we will have to negotiate our next labour agreement”.

Regarding the labour agreement for agricultural workers, negotiated independent from the packaging sector labour agreement discussed above, it has not been renewed since 2013 (BOP, 2013) and it has been expired since 2016. However, the unions at the negotiation table, UGT and CCOOO, claim a blockage in the negotiation process due to the pressure from Coexphal to postpone negotiations and the lack of mobilization of labourers. Carmen Vidal, the secretary general of UGT Almería claimed “The negotiations are paralyzed. The problem is that there is a lot of fear, it is not like in other sectors, here the workers do not mobilize. They think, if I complain I lose the place” (quoted in Maturana, 2022). Nonetheless, despite UGTs position, independent unions like SAT-SOC continue to demand the renewal and compliance with the labour agreement. In addition, they continue to be the first union with 98% of favourable labour settlement for workers and are the only union with public mobilizations in favour of labourers, with continued pickets and information campaigns. They are also the only union filing labour exploitation claims against distribution companies, having filed claims, organized mobilizations and informed European consumers against the companies BioSol, Eurosol, Haciendas Bio, Agrosol, Hortigata, Fresh Tom Export, La Unión, Agroponente, Frutas Antonio, Luis Andujar, Grupo Godoy, Beffrosa, Grupo Rey Rosa, Eurotomate Agroejido, Arena y Sol, Costa de Almería, Maleno y Torres, Campoverde, Tomspring Lis and Biosabor, some of which are members of Coexphal and are certified by Global GAP. They have also mobilized against the temporary

employment agency Terra Fecundis, which was convicted with fraud in their branch in France.

One of the Moroccan workers informing this research claimed,

“After ten years working for the same farmer, six years without papers and without contract, and four with a contract, I decided it was enough. I thought once I had a contract I would be paid more, but I still get paid 36 Euros per day, minus the Social Security expenses that are detracted from my payment while corresponding to the employer by law. Around €300 per month depending on the days worked. The moment I complained, the farmer started threatening me and only the people of SAT-SOC were willing to support me”.

Labourers are exposed to daily shifts of 8-14 hours, including Saturdays, working with high temperatures in the middle of the day of up to 47 °C and with a constant demand by farmers to work faster. They are paid below minimum wage have a short time for lunch and are not paid holidays. Adding to this, the failure of farmers to register and pay the social security contribution for their workers, leaves workers in a vulnerable fiscal position, often having to pay on their own their social security. This creates a strong feeling of frustration among workers as they see their continued exploitation overtime and the acceptance of this fraudulent practice by the social security.

Most family farmers acknowledge the existence of labour exploitation, however not in their case. Even in family farms where workers were being paid below minimum wage, these were justified as regional practices, rather than seen as exploitation. Also, there is a low affiliation of family farmers to agricultural unions (COAG or ASAJA) or labour union (UGT, CCOO, SAT-SOC). The large majority felt represented by their cooperatives and *alhóndigas*, which had a voice in the industry as members of Interprofessional associations like Coexphal and agricultural unions like COAG. However, they tended to be sceptic of their representatives and their ability to improve their bargaining position in the industry. The agricultural unions have focused on managing the price crisis, however, their role is limited as they blame the

OPFH (the cooperatives, SATs and *alhóndigas*) that they represent, for this crisis. COAG, has for long claimed that the OPFHs should help farmers collect their crops when the price is below production cost (Sánchez, 2015: 4; Epagro, 2020). This position accepts there will be periods when it will be more cost-efficient to throw away the produce than to sell it, due to produce accumulation in the market and speculation by the intermediaries. This is a dangerous position to accept, as it places farmers at the core of a yearly price and distribution crisis. Yet, it attempts to make the larger companies, who receive European funds and have large benefit margins, responsible for the collection costs and losses of farmers.

The Spanish Agricultural Guarantee Fund (Fondo Español de Garantía Agraria, FEAGA) has been granting fund for produce withdrawals from the market since 2011, dedicating 29.3 million euros for this purpose in 2019, to withdraw more than 88 thousand tons at the national level (MAPA 2019: 13; EU Commission Regulation, 2017/891). Just in Almería, the following Cooperative and SATs received financial help for the withdrawal of produce for free distribution. The cooperatives Murgiverde, Coprohnijar, CASI, Ejidomar, Cabasc (Unica Group), Vicasol, San Isidro Labrador, Natursur (Unica Group) and the SATs Haciendas Bio, Biosabor, Nature Choice, Agroiris, Las Hortichuelas, Agrolevante (Unica Group), Indasol, Costa de Níjar, Primaflor (MAPA 2019: 20-21). These cooperatives received between 250 to 370 Euros for each ton of produce withdrawn and distributed for free. COAG helps farmers get organized to destroy tons of product, to demand measures to address dropping prices and claim that the OPFHs should be made responsible. Andrés Góngora, the president of COAG, has placed the responsibility on commercializing companies denouncing the lack of transparency in the financial help of the OPFHs receive from European funds. He also denounced the lack of transparency of the Junta de Andalucía, in their investigation of companies relabelling produce from Morocco as Spanish, a common practice in some of the companies in the region, including some of those who received European funds from the European Agricultural Fund for Agricultural Guarantee (EAGF). SAT-SOC and GOAG have filed a formal complaint against the

above-mentioned companies at the Junta de Andalucía, but this has not affected the continuity of funds (quoted in Epagro, 2020).

It is worth mentioning that out of the 10 areas that the European Agricultural Fund for Agricultural Guarantee (EAGF) wants to promote in the fruit and vegetable sector, none of them concern labour issues (MAPA, 2019). Yet, some of the companies that received European funding have also been exposed by SAT-SOC, and in some cases sentenced in Almería's court, for diverse violations of the labour agreement, in the farms and packaging centres. On the regional level, the lack of persecution against companies infringing the law, empowers unfair competition among OPFHs and continued labour exploitation. On the European level it shows that we are failing to implement core sustainability principles of the Common Agricultural Policy strategic plans, as well as creating a strong dependence of small farmers on OPFHs, who have to rely on these to access European funding (mostly in the form of production inputs distributes among the members of cooperatives and SATs). These funds are essential for farmers as the horticulture production does not qualify for the direct subsidies to farmers from the EAGF) (EU Commission Regulation, 2017/891; Maturana, 2021).

While small farmers understand the need to become members of the OPFHs to assure their economic sustainability, they are increasingly aware of the mechanisms OPFHs use to generate the price crisis, including lowering prices, holding produce or destroying it in specific periods of the year. This has led to the emergence of different associations and increased social media debates among farmers exposing the price crises and claiming effective representation, leading to an increased level of social awareness, even if with low impacts on the price crisis. It is significant that the extreme right parties that emerged in the region, including Partido de Almería (PAL), created by Juan Enciso in 2005 and VOX-Almería, which emerged in 2015, have made use of the local associative tissue, as well as their demands regarding the price crisis to justify their populist discourse as well as their strong anti-immigration position. Yet, while both parties had a brief period in power, the PAL from 2007 to 2011 and Vox in coalition with the Popular Party (PP) from 2018 to 2021, both lost significant

power in the local sphere by the end of their mandate. In the case of PAL, it was because Juan Enciso was convicted of corruption and fraud in the Poniente Operation and in the case of VOX, because PP terminated the coalition government pact due to lack of compliance on VOX's part (González, 2019).

In this scenario, the labour struggles remain associated to packaging workers (mostly women) and labourers (mostly migrants), therefore most male family farmers do not support or engage with their struggles. There is a minority of small farmers that do support the labour causes and who seek the representation of engaged labour unions in their struggles. This was the case of the small farmers who initiated the STOP eviction platform in El Ejido in association with SAT-SOC to stop their eviction processes derived from years of production debt. It is also the case of small farmers whose wives work in packaging centres and who see their life affected by the labour conditions of their spouses. However, medium and large farmers, tightly connected with the boards of SATs and cooperatives, largely dismiss labour claims and the role of alternative unions or workers' associations, as a strategy to protect their commercial interests while continuing to reduce labour costs. The following section will explore different workers testimonies and ethnographic vignettes gathered during fieldwork in Almería that place the focus on labour conditions, showing how workers negotiate them, as well as how these shape the normalization of exploitative practices in the industry, affecting farmers and workers.

The forming and 'soft opposition' of the industry's public secrets



Photo 4: Bathroom key which the packaging workers at the commercialising and packaging centre *Alhóndiga La Unión* were forced to wear when going to the bathroom during work shifts (Photo published in *SOS envasadoras* Facebook group by an anonymous worker, 2018)

“I remember the day I was told to wear the key, I went to the bathroom and of course I didn’t want to wear it. In reality it was a joke by Ivan, the head of the packaging line. He was pissed about all the girls working on the line going together to the bathroom to take breaks and smoke cigarettes. But when you have been working ten hours straight with only one 20 min break, then you just do anything to stop. He had no right to do that. I saw him cutting the cardboard in the shape of a key, but I didn’t know whether to laugh or cry when he made the first girl wear it. She happened to be one of the migrants. As she was walking to the bathroom, Ivan called her back, told everyone to stop and told us loudly that from then on anyone who wanted to go to the bathroom had to do it with the key hanging from his or her neck. He also told us that only one of us would be able to go to the bathroom at a time. He then got the cardboard, and hung it with a dirty rope around the poor girl’s neck. With her eyes in tears and her head down, the girl went to hide in the bathroom. It made an impression on all

of us. It was a very tense moment, but I thought that was it. Then, a few days after, it happened to me. I was almost at the door of the bathroom and Ivan called me back so I would take the key, saying, “If you don’t wear it, you know what will happen”. I gave him a penetrating look. I couldn’t believe he was doing it to me as well. I took the key, put it under my arm and walked away humiliated. Afterwards, the girls started putting pictures of the key on Facebook and the newspapers starting publishing articles to denounce it. Finally, the bosses called Ivan off and told him to put his key away, but we still get told off when we go to the bathroom.”

The testimony above shows how workers devise their own forms of “counter-appropriation” to revert specific oppressive practices (Scott, 1985:34). Through her detailed description, my informant wanted to show the individual actions she took engage oppressive practices, like giving a “penetrating look” and contributing to the collective complaints against this practice. By reproducing the story and sharing it in safe spaces, the workers of *Alhóndiga La Union* were able to make the community aware of the situation without actually being exposed.

Nobody called the police, knowing a formal complaint would lead to a judicial process and ultimately unemployment. However, they managed to anonymously publish the bathroom key image on Facebook, along with a description of the events. They knew the image was compelling enough to make it into the national newspaper, which would then provoke an immediate end to the repressive practice. This is comparable the “soft opposition” described in Jean Oi’s ethnography of Chinese peasants’ strategies of influencing the amount of surplus grain they had to sell to the state, in which peasants kept up the appearance of compliance yet performed subtle opposition with immediate practical results (Oi, 1989:238). However, as the testimony above shows, oppressive practices regarding bathroom use continue to take place. My informant continues to critique the normalisation of inequalities in her close networks, yet at work, she continues to endure humiliation.

Inequalities are made explicit through passive noncompliance, subtle sabotage and most importantly through workers' accounts of their experiences, yet these forms of individualised local revelations often maintain the structural mechanisms of hidden oppression. In the Foucauldian sense, people's bodies and movements in the workspace are controlled, surveilled and subject to disciplinary practices, sometimes using oppressive objects like the bathroom key. It is outside the workspace that these objects can be rationalised by the workers, who choose to take it in their stride, or as in the case of my informant, continue telling the story.

When complaints are brought to light, companies address them with an individualised approach, justifying their existence as marginal human errors, rather than acknowledging their persistent presence in the industry. They are seen as isolated cases that neither reshape the commercial image of the industry nor gather the international exposure necessary to generate the kind of pressure that will ensure permanent change. Collaborative workers' protest methods, such as the Italian production slowdown or "defective workmanship" cannot be applied in Almería due to the general fear of losing one's job (Linebaugh, 1976). Yet, outside the industry, subtle forms of mobilisation are constantly taking place.

In the case of the actions taken to end the use of the bathroom key in the warehouse, it did not result in an end to bathroom restrictions, only to the most oppressive practices affecting workers' dignity. The packaging company implicated in that public secret is one of the most exploitative in the region. It had partially come to light, yet not with sufficient pressure to make the corporate structure accountable or improve overall labour conditions. Companies elude their responsibility by blaming the oppressive practices on workers. In the case of the bathroom key, the warehouse manager took the blame but did not see his position jeopardised. The company blinded themselves to further complaints by formally denouncing Elena, the administrator of the Facebook group *SOS packaging workers*, where the news of the bathroom key had come to light. To coerce an abstention from further denouncements, they made sure the police would knock on Elena's door to keep her

from publishing any similar news. Working alongside public institutions and authorities, the industrial network uses abusive practices against those who expose public secrets. While covert action stopped one oppressive practice within the system, it left room for other forms of oppression, providing new spaces for fear to develop and doing nothing to counter the culture of public secrets.

Elena understood the limitations of the women's soft opposition she was leading through the *SOS packaging workers* Facebook page, often confronted as she was with new forms of structural repression. Her goal was to strategically choose actions that would build a community culture unaffected by fear, exposing injustices that critically undermined workers' dignity (Lewin et al. 1971:13). This way, even when the police came to pressure Elena, there was no formal accusation they could prove against her, as her post had been published with the group's logo, representing its 22,000 members and not just Elena as an individual. The aim of their covert operations was therefore to produce real gains, but without allowing any of the members directly involved in the disclosure to be accused of challenging the symbolic order as a whole. The freedom of expression afforded by social media served in this case as the channel through which submission is brought into question. By generating public scrutiny, workers redirect the attention of the industry observers to the labour struggles that do not enjoy formal recognition by the authorities, traceability labels, or consumers. However, the cases where public visibility is made possible are rare.

The multiple times I discussed inequalities with industry workers across the chain, I found common responses like: 'Es lo que hay' (it is what it is), 'Así son las cosas' (that's how things are) and 'Aquí es que es así' (Here it is like this). The common assumption is that over time, inequalities become normalised within the industry, as challenging them becomes a good enough reason to get fired and further compromise people's livelihoods. This does not mean that inequalities are not discussed, but rather that they cannot be discussed openly as a feature of the industry. As the individuals at the top of the chain define the commercial image of the industry as sustainable and egalitarian to maintain their market profile for the increasingly demanding and

ecologically conscious European buyers, the persistent images of inequality are intentionally concealed. Such concealment spreads to the lower levels of the chain, coding an unwritten rule on what not to say about the industry, and forming a public secret, “that which is generally known, but *cannot be spoken*” [italics in original] (Taussig, 1999:51).

The creation of a public secret and its disclosure can therefore provide a useful epistemological entry point to challenge the hermetic management of inequalities within the industry, illustrating the diverse ways in which individuals live and deal with them. As Karen Warren suggests, “dysfunctional systems are often maintained through systematic denial ... [and] this denial need not be conscious, intentional, or malicious” (1990:125). The situations which produce public secrets vary, and are not static in time, leading to different moments of unmaking and revelations. Some use these revelatory moments to vent their problems, some to justify existing inequalities in anticipation of future liberties, and others to unveil and negotiate their own agendas and redress certain inequalities. The interests of the industry and the interests of farmers and labourers within the chain are socially revealed through heterogeneous ways of “knowing what not to know, its strategic absences, its resort to riddle and tone...” (Taussig, 1999:50).

Public secrets are then revealed as a product of our interiority — defined as “an individual’s inner consciousness, the continual conversation one has with oneself” (Rapport, 2008:331), combined with the necessity of validating those self-conversations with the outside world. Alicia, one of my informants, shared with me the anger she experienced when one of her co-workers in the warehouse fainted and she was forced to keep working by her side without calling an ambulance. At that moment she and her co-workers could only communicate their distress through their eyes and gestures, but since then, this story has become common knowledge in the town. The workers have slowly shared the story in their social circles outside of work, generating a shared understanding of injustice and the recurrence of abusive events.

This formation of local identity, and the abusive event itself, were nonetheless kept from the public domain, as there was no news, no complaints and no sanitary record.

In an environment of 'institutional density', the agricultural industry, financial institutions and conservative local administration operate a symbolic hegemony to perpetuate a vertical integration of the industry into the global market (Martínez Veiga, 2001a:30). By controlling the very "standards by which their rule is evaluated", the agricultural elites dominate not only the physical but also the symbolic means of production (Scott, 1985:39; Dumont, 1970). In a Gramscian sense, consent for the elite's rule is engineered by controlling the 'ideological' sectors of society through culture, education, and media (Ibid). The potential consequences of complaining not only threaten citizens' integrity, but also the integrity of one's job, as neither the authorities nor the industrial companies act to protect workers from these practices. The reliance on quality certificates produces a strategic 'credentialism' that gives legitimacy and social validity to the fierce competition at the lower links of the chain, and sets the rules of exclusion (Miller 1967). The industry builds a "symbolic climate that prevents subordinate classes from thinking their way free" (Scott, 1985:39). In this way, the industry controls not only the entry of labour, but also the exit, leaving the worker unarmed when a conflict arises.

In the workplace, domination occurs at the level of ideas and labour performance (Gramsci, 1971; Lukács, 1972; Scott, 1977). In the case of Almería, workers have remained largely critical of the domination they experience, albeit outside the work environment. The testimony relating the bathroom key incident resonates with the following statement: "the peasants, having mulled for a long time the assertions that they have heard proclaimed and whose glitter has temporarily dazzled them, end up, when good sense wins over the emotions aroused by stirring words, by discovering their inadequacy and superficiality and become generally distrustful" (Gramsci cited in Davidson, 1984:147). The hierarchical nature of industry keeps classes of workers subordinate, which, given the difficulty of upward mobility when 91% of contracts are temporary, makes it unlikely for those in the lower echelons of the chain to improve

their status. "Only "backstage," where gossip, tales, slander, and anonymous sabotage mocks and negates the public ritual order, does elite control fall away" (Scott, 1985:27).

Everyday forms of exploitation and their concealment constitute the public secret, and concealment is a product of the competitive relationship among workers. Stories such as that of the bathroom key and the girl who fainted are kept alive in the local imaginary, but as Martinez Alier's (1971) analysis of Andalusian agricultural labourers suggests, labourers' interiority does not matter to the structure of oppression. People can disapprove in their minds, but such disapproval does not lead to structural change. The systematic norms of subordination include being paid below the minimum wage, making workers pay for their own social security, being forced to work for over 12 hours without breaks, having to endure managers' screams and acts of public humiliation. These practices are forbidden under the union's collective agreement at the national level, yet they are not prosecuted in the region, producing a logic of inevitability with the appearance of legitimacy.

However, the industry and its representatives continue to hide these practices through the manipulation of labour contracts and labour statements. These are legitimised by a lack of prosecution and occasional warnings to farmers and warehouses by the local police in advance of visits by labour inspectors. While, the small 12-member team of overworked labour inspectors for the entire Almería province and the custom of certain workers disguise the occurrence of illegal practices by denying complaints and the experiences of their work colleagues on social media, does not render hope for a change in the working conditions in the near future.

Revealing public secrets and the normalisation of inequalities



Photo 5: Mass cucumber dumping by producers of Almería and Granada (Photo by Agroinformación, 2018)

For a month now, the price a farmer receives for a kilo of cucumbers has been below 20 cents, that's below the production cost, which is normally between 20 and 30 cents. It is cheaper for me now to leave the cucumbers on the plant than to pick them and sell them. How is this possible? How is it possible that we are living in this situation and yet in supermarkets across Europe our cucumbers are sold at 1.90 pounds a kilo? It is ridiculous. This year the excuse was the yellow vests protest in France. They argued that the day-long delays with the trucks had made supermarkets lose a lot of their produce. However, this is just an excuse, the truck delays were not days-long, but hours. The produce was not actually wasted, but as usual, they take every opportunity to push the prices down. Although the situation is tough, this year I am happy because we are uniting. Many commercialising companies in Granada and Almería, together

with farmers associations like '*Agricultura Viva en Acción*', have decided to dump the produce together as a symbol of protest: 1,500,000 kilograms gone to waste to make visible our annual drama. Usually we do it individually, so no one takes notice, but this year the crisis has reached a peak. But all of our efforts to make consumers aware of the problem have not really worked, as the news didn't make it to the national media. It was only through negotiations with the supermarkets that the price was increased to 60 cents, but the authorities still don't take responsibility. It seems that everyone finds this normal. In the end, as always, the negotiations took place within the chain, without proper representation in the media. Once again the wider society remains silent."

Rendering visible the unfair practices across the chain is a form of protest, which requires witnesses. The testimony above shows there is an underlying unwillingness for this witnessing to take place, and consequently for people's experiences to be recognised. It reveals how wider public secrets, like the control of big distribution chains over the price and its daily fluctuations, produce a trickle-down oppression of small commercialising companies and farmers, who in turn oppress their low-skilled workers. Most anthropological studies of inequality in western Almería have looked at the oppressive relationship farmers' hold with low-skilled immigrant workers (Martínez Veiga, 2001), but the ways in which the wider structure of the chain oppresses farmers has been overlooked. This is because farmers do not directly interact with the market or the people who set the prices. They react to the change in price by holding onto their product or even by dumping it, but they have little effect on the supply volume and the price system, even through collective actions like the one described above.

Given the price pressures, normalised individual strategies of survival like harvest-dumping, and even collecting dumped vegetables to sell in the local street markets, take place constantly without regulation from the industry or institutions. These survival practices are illegal, as farmers are forbidden from dumping food in the fields and companies are forbidden from allowing waste produce to be re-sold, yet the

absence of censure for these practices normalises them. On a general basis, farmers do not sit at the price negotiation table, or have access to those higher circles in the chain, yet through situations of crisis and collective dumping practices, they can bring under public scrutiny the wider public secret of price speculation in the basic fresh product market. However, as Scott argued, “everyday forms of resistance [or of survival in our case] make no headlines” (1985:17). The lack of action by the state turns the companies’ price speculation, along with their reliance on a system of temporary contracts to pay less state taxes, into publicly accepted practices. Companies take advantage of weak market regulation for their own economic profit.

Companies also take advantage of the low number of labour inspectors, and the weak verification processes of social security officials to continue paying workers below minimum wage, through temporary contracts and without declaring all the worker’s labour to social security. UGT and CCOO estimate that 40% of the annual wages in Almería are not being declared. This represents social security fraud totalling more than 50 million euros per year by the companies of the agricultural sector (Sancho, 2018). The Ministry of Labour persecutes immigrants who go on vacation while receiving unemployment benefits, as dictated by labour law. Meanwhile, the same ministry does nothing to penalise the companies that fire workers in the spring only to hire them again in the autumn, thus avoiding the taxes they would pay for a fixed worker. The following ethnographic vignette shows how workers and alternative union like SOC-SAT, attempt to bring visibility to this normalized exploitation and fraud.

On the 22nd of June 2018, the SOC-SAT had called for a worker's strike to protest against the precarious work conditions of migrant workers, and a lot of them had decided to observe the strike. At 10am I saw from my balcony that the intersection between Manolo Escobar Street and the Boulevard, where I lived, was starting to fill up with migrant workers. By 11am hundreds of migrants, predominantly Moroccan, had taken to the Boulevard occupying the whole street near to the social security office. They claimed, “We want holidays without sanctions”. Given the seasonality of

agriculture most labourers and packaging workers work from 6 to 10 months a year, having to resort to unemployment benefits in the remaining months. This is a result of the practice, common among employers in the industry, of sticking to the minimum amount of fixed contracts to avoid paying more taxes and social security. The state is then made responsible for paying unemployment benefits to the majority of the workforce for a number of months every year, saving farmers and packaging companies thousands of euros annually.

Given that most workers know they will have to work the following season, most choose to travel while getting benefits, as it is the only time they have possibility to go and see their families. However, if during that time the social security contacts them by mail and they do not reply because they are away, they can be hit with fines greater than the value of their benefits. Tired of fighting for basic rights, such as the stipulated minimum wage negotiated by the unions, the strike was intended to shame public institutions like the social security office into making farmers and corporations accountable for the temporary nature of contracts, instead of the labourers.



Photo 6: Immigrant protest organised by the Andalusian Workers Union under the slogan “Holidays without sanctions”. On the banner: “Worker: The time has come, to the fields with rights. Rebel!” (Photo by the author, 2018)

I filmed this march in order to keep a record for my research, and realised I was the only one doing so in the entire protest. From a distance I observed that all the Spanish locals were disappearing down sides streets, while people looking from their balcony did so surreptitiously, so that nobody from the street would recognise them. Not a single journalist out of the ten different agriculture related news outlets in the region was present. The scene revealed the physical effort that the autochthonous inhabitants were making in order to turn a blind eye to migrant problems. A Spanish woman recording audio on WhatsApp caught my attention as she passed by on my side of the street trying to get away from the protest. With her phone in front of her mouth as if using a dictaphone, I overheard her saying: “They are invading us, seriously. The main street has been taken. They are going to kick us out of here”.

The woman turned out to be a packaging worker affected by the same labour precarity denounced by the protestors, and also a migrant, originally from Málaga. Yet, she didn't identify with the strike, just like the other inhabitants of the town, who did not show up that day. The resistance effort made by over 500 protesting migrants was left unseen. The day after, there was no news, no pictures, and no videos. Nobody was talking about it. I sent a homemade video of the protest (as a local neighbour) to the twenty news outlets in the region. Only two digital newspapers published it and the strike was not discussed further. What stuck with me after observing this event was the prevalent feeling in the town that regardless of everyone knowing about the precarity of the labour conditions, the issue was avoided both discursively and physically. It was as if this were a secret known to everyone but about which nobody could talk in public, especially not autochthonous people.

The SOC-SAT aims to create a conscious community of seasonal labourers who can denounce their work conditions collectively. As they slowly attempt to build a strong community that is amenable to exposure, they have to advance individual exploitation cases. These cases usually make it to court with the verdict favouring the labourers in the form of economic compensation, rather than a promise for structural change or a

curtailment of oppressive practices. The union is critical of their work as they see these individual cases as reinforcing the idea that problems are isolated and unrepresentative, a stigma that the union is trying to overcome by filing multi-actor cases for long-term sustainable solutions to claims of oppression. As the testimony below shows, this is of extreme importance because taking individual union action when there is little bargaining power can increase the vulnerability of workers.



Photo 7: Moroccan Labourer with her working life report (Photo by Benjamin Llorens Rocamora, 2018)

“The day I went to the to the syndicate I didn’t know what was going on. Some of the day labourers working with me in the greenhouse had talked to the SAT and had decided we had to go on strike. They told me it was a good idea and I followed them to the meeting. There they told us that the agricultural collective labour agreement was not being followed and that we were getting paid below

the minimum wage. I went ahead with the strike. After ten years in Spain, it felt good to do something to improve my work situation. A few days afterwards, the farmer we were complaining about did not want to negotiate, and at the union they told us that we would have to take the matter to court. I kept getting worried, because I had worked with the same farmer for ten years and nobody else would hire me. A week later, the union told me the farmer had fired me, but they would try to get an indemnification. 3000 Euros, that's all I got. But this is not all. Do you see all these papers? They are work contracts, legal ones, and do you see this social security sum? Well, the farmer made me pay it all, while legally he should have paid it. Every time, he would come with the paper, give me my corresponding salary according to the document and point to the amount of social security he had to pay. He would tell me "if you want it, you have to pay it". Holding my entire salary in my hand I would have to let go of my pride and give him back the amount going to social security. The first five years working in Almería, there were no contracts, just his orders and a small salary, and when I got my papers and I was able to bring my kids, I thought things would change. Instead, things got worse. There were more of us in the house with less money coming in, because I had to give away the amount due for social security. I tried paying for fewer days, but then the social worker would threaten to take my kids because I was working very few days according to the books, while in reality I was working seven days a week. Now everyone knows about the farmer, but I only have three thousand euros left and I don't know what to do, because nobody else will hire me."

Insubordination, rebellion and denunciation, such as are described in the testimony above, take place on rare occasions. Even though the SOC-SAT has a record of winning 98% of the cases they take to trial, in this case, the union could not prove it in front of the court that the payment to the social security had been made informally, without any written record or corroboration in her working life report reports. The papers which she says justified the farmers' fraud, were completely legal. As such, the court could not rule a harsher sentence even if they believed her to be right. Not even if a

labour inspector had made a visit to her greenhouse and certified the irregularities taking place, could she find justice. In front of a court, the inspector's testimony would only implicate the farmer for the day of the inspection, as the irregular behaviour cannot be generalised if there is no fiscal proof. In this way, the combination of a lack of regulation, a weak presence of labour inspectors and insufficiently punitive court rulings results in the atomisation of workers. In a regional industry where 91% of contracts are temporary, the union leaders argue that a change is almost impossible as long as denouncements are not made collectively, because only then will the cases of exploitation and coercion be seen as systematic instead of isolated and normalised forms of oppression. An example of how collective action at the national level can lead to significant change is the 2022 labour reform, which attempts to reduce temporary contracts. Due to the labour reform, fixed contracts in Almería have increased from 12% in April 2021 to 56% in April 2022, as announced on May 12, in Twitter, by the Sub Delegation of Government in Almería. The reform is leading to a substantial change in the regional temporary contract model that can significantly improve the terms of employment and the conditions of workers.

Nevertheless, cases like the above are a reminder that individual workers can contest the formal definitions of hierarchy and power, even if the consequences are severe for the worker. Not only do these contestations exist, but they also create a precedent for others to present their cases, singling out the perpetrators of a given type of oppressive practice and showing to all members of the industry that at least sometimes, justice protects the labour force. Breaking the appearance of inevitability is the first steps in removing the fear that obstructs systemic change and subversive thought (Scott, 1985:330).

Conclusion

Focusing on inequalities, this chapter has unpacked how public secrets are shaped and revealed. I have examined how workers experience unceasing forms of labour

oppression, hidden by the industry as public secrets, and how they try to challenge these secrets. The data suggests that the problem of constructing public secrets around inequalities lies in the occasions where, upon being disclosed, the “secretly familiar” events are seen as isolated cases, producing an uncanny reductionist worldview in which the exposed public secret is consciously believed to be already surmounted (Freud, 1997:222).

The level of denunciations is low due to several factors. For one, workers have a general distrust of labour institutions and their willingness to help them, they also fear unemployment and instability and they know that even if the court rules in their favour, the compensation they will receive will be much lower than the poor salaries they earn. Additionally, the number of labour inspections is very low and the local police accompanying the inspectors generally tip off farmers, making official denunciations virtually impossible. Also, the state and the larger agricultural unions, like *Comisiones Obreras* and *UGT*, or the larger agricultural associations *ASAJA*, *UPA* and *COAG*, have for years justified the inequalities at the bottom end of the chain as regrettable yet isolated and understandable responses to the heightened pressure of the European market on smallholder farmers. This has led to an institutional effort to justify and protect those conducting oppressive labour practices, as demonstrated by the minimal commitment to prosecuting rights violations at the lower end of the chain, and the affordable financial sanctions imposed on the offenders. The lack of fiscalisation provides an environment suited to the acceptance and continuation of unfair labour practices. At the same time, the low level of persecution and exposition by authorities and labour institutions render these continued practices invisible to the public eye, at least by the regional media and in industry discourse.

Promising insights should come from the Ministry of Labour state survey, which is investigating whether there exist conditions of labour exploitation, human trafficking for forced labour, slavery, or slavery-like conditions such as servitude in the region’s agricultural industry. The objective is to detect responses that denote criminal offences, with specific questions about physical and psychological abuse. The agricultural associations *COAG* and *ASAJA* have criticised the questionnaire for its

alleged 'ideological sectarianism', explicitly revealing both their agenda of concealing existing forms of oppression, and the privilege they grant to the industry's private patronage. Yet, it is of extreme importance for institutions and social scientists to continue to analyse the ways in which workers expose the unfair labour conditions they experience, the fears that might lead them to conceal abuses, and the individual survival strategies that continue to emerge as they cope with and resist the normalisation of inequalities. This data can help labour inspectors and unions to attain a broader understanding of the factors impairing collective workers' denunciations that would lay the groundwork of a legitimate state demand for the industry's structural change.

Chapter 3

It Is What It Is: Visualizing sustainability collaboratively in Western Almería

Introduction

The industrial cluster in western Almería, a centre of intensive winter vegetable production in Spain, consistently elides workers from the framing and regulation of sustainability. Beginning from a critical understanding of the problem of 'sustainability,' I worked with collaborators who are farmers in the region to visualise alternative forms of sustainable agriculture emerging from the industry using documentary film. By co-producing situated narratives emerging from the relationship between farmers and ecosystems, I argue that we can present alternatives to the industrial framing of sustainable agriculture. The chapter explores the efforts of my collaborators and myself to visualize sustainability as a process of diversity. This entailed documenting their engagement with different knowledge systems collaboratively in order to investigate how their scientific and experiential knowledge of intensive and agroecological production has influenced their transition to sustainable agriculture. It involved following their life histories, political and economic attachments and choice of multispecies ecologies as their method of agricultural production. The analysis of our visual collaboration is accompanied by a critical reflection on the potentials, and shortcomings, of film as a multimodal ethnographic strategy to intervene in environmental media and the anthropology of sustainability.

Western Almería is the largest site of greenhouse intensive vegetable production of the world, exporting tomatoes, cucumbers, peppers, eggplants, watermelons and courgettes, among others, mainly to European and American markets. This industry

has grown over the years due to the work of smallholders' families and migrant labourers who are hired on a seasonal basis, often facing precarious working and living conditions. The majority of farms belong to single-family units managing between 1 and 3 hectares of land who sell directly to the distribution firms in the region. The industrial cluster in western Almería is composed of over 700 commercializing cooperatives, societies of agrarian transformation and *alhóndigas*, and the auxiliary industry providing production inputs, including pesticides, fertilizers and seeds. The distribution firms control farmers' market access through a buyer-driven value chain strategy bound to the decisions of large supermarkets, which demand specific size, color and shape for each product. The auxiliary industry, including agro-giants such as Syngenta, Bayer and Basf, all with headquarters in the region, build on scientific and technological designs to help farmers meet production standards, while creating farmers' dependence on capital-intensive inputs.

The industrial cluster certifies its sustainability performance across all stages of production through private certifying companies, such as Global G.A.P. There is not a unified set of criteria. Standards vary from country to country in terms of meeting the basic requirements of the national and international regulation in relation to pesticides equipment and working conditions. In Almería, farmers are responsible for filling out and submitting the sustainability checklists given to them annually by the certifying companies that oversee the farms. Farmers often comply with the regulations as they can be fined if they do not meet the minimum health and safety requirements or in relation to pesticide residues in their produce. However, as private entities interested in selling their sustainability certificates, the certifying companies, are quite lenient, especially regarding social sustainability which is loosely regulated in the national and European policy. Significantly, the Andalusian Workers Union has taken legal action against the certifying companies Global G.A.P. and Naturane for certifying farms and commercializing companies that do not meet basic labour rights for their workers.

As Katherine Homewood suggests, the drive to translate sustainability goals into

verifiable measures at a global level has made it virtually impossible to find “convergence between the three core dimensions of economic growth, social equity and environmental protection” (Homewood, 2017:92). This can also be observed in the new European Green Deal Farm to Fork Strategy (European Commission, 2020), which although develops a coherent strategy to reduce pesticide and fertilizer use, it continues to exclude the assessment of social sustainability and continues to rely on third party certification for its implementation (European Commission, 2020). The preference of technical solutions over political ones, trickles down to global industries that set their quality assurance and sustainability protocols in the same technical manner and with clear distinctions between economic performance, environmental impact and labour conditions and relations. This type of ‘conservation from above’, where standards are set and measured by private certifying companies, favours corporate decision-making and scientific knowledge over local knowledge and practices (Brightman and Lewis 2017:9).

Farmers deal with increasing risks of yield loss due to biological imbalances, but also increasing market risk. The price instability and asymmetric along the value chain, undermines farmers decisions and decreases their bargaining power (Morales, 2017). This leads to a spiral of indebtedness, even in farms with organic production (European Commission, 2020; Viganò et al. 2022). Over the years, the multi-actor organizations representing the industrial cluster commercially and politically, such as the Spanish Interprofessional Organization of Fruits and Vegetables, have been attempting to conceal the underlying precarity and input-dependence of western Almería’s production, by producing and circulating specific narratives. This has been done both by denying existing structural labour problems and the over exploitation of resources, by referring to them as “myths” and by promoting stories that highlight the resilience of family farms and their ability to overcome hardship as evidence of the sustainable character of the region. An example of such strategy can be seen in the film *Hortiespaña* (2017).

A critical series of counter-narratives are articulated daily in farmers' and workers' networks and associations and have been represented in the media through documentary films by Moroccan and Spanish directors, and numerous national and international reportages describing the industry's lack of sustainability. These films highlight the normalization of racism and modern-day slavery conditions faced by migrant workers in the industry (Nieto, 2000; Rhalib, 2007), and the precarity of low-skilled labour in farms (Serra, 2001), and in packaging centres (Évole, 2009). Other key themes include the ecological catastrophe and the impacts of soil erosion, aquifer pollution and displacement of autochthonous fauna and flora (Le Tatou, 2018). In line with these documentaries, regional farmers and workers who participated in this research critically suggest it is not only a question of lack of appropriate remuneration. Labour instability also widens the gender, ethnic and interspecies divide, triggering confrontation among communities of workers and affecting the mental and physical health of families. The lack of attention to these issues is bound to perpetuate temporality, inequity and oppression (Reigada et al. 2021), increasing social stratification, segregation and natural degradation (Delgado and Aragón, 2006).

The resurgence of workers' livelihoods and multispecies arrangements at the margins of intensive agriculture projects, such as that of western Almería, reveal the "patches of hope or resistance", accentuated by the "encroaching unlivability" within the greenhouse environment (Tsing, 2017:61). Attention to resurgence is what Anna Tsing suggests is necessary in the anthropology of sustainability. She defines resurgence as "the work of many organisms, negotiating across differences, to forge assemblages of multispecies livability in the midst of disturbance" (Ibid:52). She argues sustainability is an issue of the relationships between beings, human and nonhuman and therefore an issue of livability. To be able to show these, Tsing suggests we need to trace the nexus between ethnographies of specific communities, with their wider connections as part of socio-ecologic systems. For Tsing, "meaningful sustainability requires multispecies resurgence, that is, the remaking of livable landscapes through the actions of many organisms" (Ibid:51). This entails accounting

for the labour of workers who cope with and repair landscapes around and within global production systems and the current risks they face.

Using Tsing (2017), I focus on the analysis of different layers of reality appreciating the frictions, inconsistencies, and diversities that shape meaningful sustainability through film. From this point of view, sustainability is best understood as Brightman and Lewis suggest, “as the process of facilitating conditions for change by building and supporting diversity - ontological, biological, economic and political diversity” (2017:2). This requires openness to non-reductive and non-hierarchical forms of knowledge that allows us to understand “the human–nonhuman sympathies” that make resurgence possible (Tsing, 2017:61). Seeking the inclusion of workers and their perception of other species in the representation of sustainability, I worked collaboratively with research participants and film director Benjamin Llorens Rocamora to create an ethnographic film documenting sustainability from their perspective. The collaboration took place with Antonia and Matías, a couple running a family farm. I meet them through a common friend while doing fieldwork and we rapidly saw in each other a common interest to understand sustainable agriculture and make visible the human and non-human interactions involved in the process of sustaining life. This gave rise to the 32-minute ethnographic documentary *Esto Es Lo Que Hay (It Is What It Is)*, Phd film, Yáñez Serrano, 2021). *Esto Es Lo Que Hay* is the first output of our ethnographic film project, a long-term collaborative process that is still ongoing. The film is available here: <https://vimeo.com/504293153/da0f66b8c2>.

Filmmaking is a particular kind of practice that establishes new ways of relating to people. A key reason for using film as a fieldwork method in this context, is that its creative process opens and can sustain research relationships overtime. Antonia and Matías, felt uncomfortable being interviewed over and over about the same subject. But because they were actively creating the content and character of the ethnography, as well as defining the arguments and the aims and the objectives throughout our collaborative discussions, they became hugely invested in the film process because they shared a vision of film as a way of knowing and saw it as an

opportunity to debate and negotiate an effective strategy of representation. Often, they took a lead in defining and communicating the issues and themes. In doing so, the audiovisual materials offer a mode of representation that is evocative of experience, outside of academic texts, whereby the participants can recognize themselves and their experience in the film. Epistemologically, I would not have been able to obtain the same depth of data or access to their ways of knowing through interviews. As such, the film works as a method of ethnographic collaboration and representation in relation to sustainability and as a means to give a sense of their embodied lives that might not be communicated effectively to an audience through text.

Through the collaborative film process, Antonia and Matías articulate a critical perspective on the unsustainability of the industry and how they are encouraging a multispecies resurgence in their farm in pursuit of meaningful sustainability. Their life history is significant for the anthropology of sustainability because it reveals the physical and psychological impacts of unsustainable practices, documents how the couple rely on their communities and networks of support to overcome the effects of unsustainability and highlights the complex entanglements of academic and farmers' knowledge systems with policy and the values and practices of sustainable living.

The filming process has combined an apprenticeship, participant observation, and postproduction discussions around style, editing and how to most effectively represent the key themes, including sustainability. The film process began without the camera as I engaged in a period of apprenticeship at the farm in order to experience the working day as a labourer and learn about the normalisation of intensive physical labour under extreme heat conditions and the accompanying bodily transformations and adaptations that are required. I learned about handling plants and their needs, the idea of educating plants, plant diseases and cures and pesticides and biofertilisers. Likewise, I learned about the economy of family farms, the social dynamics between farmers, agronomists, working family members and farm labourers, and the impact of agricultural labour on the participants' bodies and their ways of being in the world.

Gradually I started filming, with the help of Benjamin, walking testimonies, formal interviews and daily scenes of the couple's everyday work and life experiences from the perspective of a participant observer. This was accompanied by critical discussions with Antonia and Matías about their views on sustainability and the images they associated with those views. I did not design interview scripts, instead we focused on exploring the themes and personal stories that they found important for their own process of attaining sustainability. Our approach could be framed as participatory action research (PAR), since it engages active community members in the generation and analysis of knowledge pertaining to their situated experience: the goal being to visualise their personal transformation and inform social change (von Faber et al. 2020; Cargo & Mercer, 2008; Cornwall & Jewkes, 1995). This type of long-term engagement shifts power dynamics and generates unexpected outcomes by allowing research interests to be modified by local needs and a project's scope to be extended by engaged participants (White, 2003).

Benjamin and I worked through the film rushes to edit a visual narrative and then would re-edit the materials guided by the couple's feedback and our ongoing conversations about sustainability as a means for attaining ontological, biological, economic and political diversity. "Visual representation can offer pathways to the other senses and resolve the difficulties anthropologists face in research and communication concerning emotions, time, the body, the senses, gender and individual identity" (Pink, 2006:49). Through film and engaged editing, we can capture emotions and identities in their social and material context, representing in an experiential way the transformational processes in human livelihoods (MacDougall, 1998). Furthermore, by working alongside participants to show their personal evolution a key aim is to empower and support them by having them control how their narrative is told. The following section will explore the collaboration with Antonia and Matías to visualize sustainability as a process to attain diversity.

Collaborative visualizations of ontological, biological, economic and political diversity

Almeida, Moore and Escobar (2017) suggest anthropologists need to support 'ontological diversity' if we want to continue having a liveable world. This requires, as Donna Haraway suggests, "learning to stay with the trouble of living and dying in response-ability on a damaged earth" (2016:2). As part of that responsibility, we must recognize that our multimodal research tools are complicit in shaping inequalities, dependent on capitalist commodities and reinforcing the power hierarchies existing in anthropology. Takaragawa et al. explain we do this "by making recourse to technofetishism or by dressing up neocolonial practices of extraction, inclusion, and appropriation in new language" (2019:2). By producing our documentary, we were accepting the extractivist and industrial manufacturing process involved in the making of the filming equipment. We were also accepting the same logic of communication as the agro-industry and by doing so, we were from the starting point accepting the marginal impact this visual piece would have in the visual narrative of the industry. We also considered the possibilities of the documentary having a negative impact for Antonia and Matías' project and for agroecology as a regional practice. That is why we conceive this project as an experimental collaborative project that continues to be developed and whose impacts and outcomes are an ethnographic film and a collaborative critical analysis of the representation of sustainable agriculture.

The process of creation of the documentary serves as a tool of discussion between participants and filmmakers to explore sustainability and its visualization. In this chapter, I have chosen to insert screenshot images rather than timed sequences of the documentary, because the collaboration with Antonia and Matías revolved around the discussion of those images. The current cut only shows one part of the process, the transition of Antonia and Matías from industrial to agroecological production as they leave the agro-industry in western Almería and move to Almócita in the Alpujarras mountains. As part of a longitudinal ethnographic collaboration, we will continue to

film and document their turn to emotional agriculture and the multispecies resurgence that is taking place at their farm on an ongoing basis. This provides a means for discussing and imagining how to represent sustainability in a way that generates positive change and how we can make visible ontological, biological, economic and political diversity.

Matías and Antonia come from two different villages in the Alpujarras mountains. They both came to El Ejido, in western Almería to make a living as waged labourers in family farms due to lack of opportunities back in their villages. Initially, they were waged labourers for other farmers, being forced to work intensively and without the basics of health and safety. During this time, as Antonia references in the documentary, she had severe poisoning from pesticides because the farmer she was working for, fumigated the plants with pesticides while she was working. This was “normal” in the region at the time and as she said even the doctors took it lightly. She claimed exposure to pesticides has increased the rate of cancer in the region. She never had cancer, but she had to withstand those working conditions, and even take extra shifts in the packaging centres to meet the needs of the family and save some money to buy their own land.

Eventually, they managed to get a mortgage with a regional agricultural credit bank to buy one hectare of land and they started producing as they had learned in the region, buying and planting a single variety of seeds, using pesticides and fertilizers for these to grow and selling them to a commercializing house. Ecologists have documented the biodiversity loss in commercial plant breeding (Harlan and Martini, 1936), the unsustainability of the fossil-fuel based resource dependency, the unfair market power of large corporations, the loss of food safety (Galt, 2014; Patel, 2013) and the lack of energy efficiency in industrial agriculture (Pimentel et al. 1973). But Antonia and Matías remained convinced that the industrial model was the only viable option for them, as was continuously asserted by the regional commercializing companies, research institutes, agronomists and farmers. For years, they acted like everyone else, but gradually they started not feeling comfortable feeding their two sons and

daughter the carton-like peppers they were growing, as these were over-fertilized and pesticide-intensive. This led them to search for biological diversity and start producing niche varieties of ecological yellow, round and marrow courgettes, for a commercializing company, selling mostly to UK supermarkets.

They had a contract with the commercializing company that guaranteed they would be paid for their niche variety harvest. The private certifying companies Naturane and Global G.A.P. also assured the ecological traceability of their seeds and the sustainability of their production. However, the couple were extremely worried about the detachment of certifying and commercializing companies from their own affective relationship towards the plants and vegetables they grew at their farm. Matías explained,

We saw how the sustainability protocols of certifying companies served to assert the functioning of the industry rather than guaranteed that the produce was honest and produced in the most sustainable manner possible. We were not feeling comfortable in the industry, and we started looking at things differently.

Even with the ecological certification, they maintained the same type of intensive production, only now with seeds labelled as ecological and with fewer chemically active substances in the pesticide products they use. The discussion with Antonia and Matías to visualize this initial part of their journey towards meaningful sustainability, revolved around the slow sensory realization that things were not right. The four screenshots below, taken directly from the documentary, are examples of how we chose to collaborate and represent their changes in sensory perception.



Image 1



Image 2



Image 3



Image 4

Image 1 was taken in a clearing outside Antonia and Matías' farm, upon their request. The clearing serves as an informal dumpsite for the neighbouring greenhouses, where someone had thrown away two barrels of DD and Tellone 2 pesticides, containing 1,3-Dichloropropene, a substance banned from the EU in 2007. In 2018, when we were filming, local farmers were still using those products, creating a dominant smell of pesticide fumigation that Antonia and Matías wanted to highlight as part of their toxic livelihoods in the industry. Image 2 shows the remains greenhouse plastics, over and around autochthonous bushes. Patches of teared plastic can be found everywhere as the proliferation of the region's plastic greenhouse increases, including in natural spaces such as the sea and rivers, as well as roads and the village's streets. Contrary to this, the food waste, that could be re-introduced in the soil as compost, ends up rotting in giant containers in the back of the packaging centres sometimes already packaged individually for its sale to European supermarkets, as can be seen in image 3.

Through these images, Antonia and Matías wanted to show how they gradually started to reject the nasal itchiness of pesticides, as well as the visually dominant plastic whiteness and the permanent noise of plastics blowing in the wind. Though their interaction with this ‘disturbed’ environment (Tsing, 2015), they started having conflicts with the smell, sight and hearing they had been accustomed through years working in the industry. “The messy and surprising features of such cultural encounters across difference”, which Anna Tsing call ‘frictions’ (2005:3), allow us to see how the imagined universal agro-industry clashes with farmers’ embodied experience. This ‘ontological multiplicity’ defined as “the diversity of ways of conceiving what exists and its relations” (Blaser 2013:552), allows a stop-price-speculation farmer’s truck to co-exist with the musical trucks of the street parade of San Marcos festivities in El Ejido, as shown in image 4. As worlds overlap co-producing cultures in interaction, different ontologies are negotiated generating friction at the boundaries. In the case of Antonia and Matías the boundary was their own bodies, a feeling that they needed to reclaim their disturbed sensory experience.

The radical change in Antonia and Matías’ life came in 2010, when the commercializing company they were signed up with went bankrupt and left their harvest unpaid. This made them unable to pay the mortgage of their land and consequently they faced an eviction process led by their agricultural credit bank. As they describe in the documentary, the bank persecuted them with phone calls in the middle of the night, harassing family members to pay or leave the property. This let the family to a process of rupture and emotional distress. They saw that none of the people they had worked with in the industry were willing to help them deal with the unpaid harvest, and they started blaming the situation on themselves, on their inability to provide for the family and care for one another. As Alteri and Toledo (2011) suggest, when organic farming systems are managed as monocultures, these assert the dependence of small farmers on external input providers and commercializing companies, who supply the commodified biological inputs and control the price and certification protocols. This was the case for Antonia and Matías, whose financial dependence on the commercializing company and the bank, led

directly to a process of indebtedness, which also resulted in different processes of family estrangement due to social shaming, self-blame, intra-familial and intra-marriage arguments, and depression.

As this took place, Matías and Antonia started talking to other farmers facing the same situation and they decided to start the Stop Eviction platform in El Ejido. They hold their meetings in the Andalusian Workers Union (SAT). Through the Stop Eviction platform, they also created a commission to help the families who had been evicted to develop new life projects with the help of Coop57, an ethical finance cooperative that financed the Platform's projects in El Ejido. This was significant because by engaging with SAT the family discovered a network of support for the social economy and for the first time a financing mechanism that could allow them a realistic exit from the predatory agricultural credit banks of the region. The struggle to stop their own eviction also led the family to change their production method through an entanglement between academic knowledge, policy knowledge, and 'lay' kinds of knowledge. Antonia went back to collecting and drying seeds from the harvest as she used to do when she was young. Matías went back to his home village to get litterfall from the mountains and use the mountain microorganisms to make a living soil, just as his father asked him to do when he was little for their own field. He also did an online course of an agroecological school in Nicaragua, where he learned how to turn those mountain microorganisms into liquid biofertilizers, as well as the scientific grounding of agroecological production. The following section explores how the couple created ontological diversity and how together we chose to represent it in the film.

Ontological diversity

Agroecology is a farmer-driven global movement promoting food sovereignty, equitable food systems and the protection of biodiversity by mimicking natural ecosystems. This is done through non-energy intensive techniques that derive from diverse practices in traditional agriculture, such as crop diversification, which

enhance soil fertility, pest control and farmers' autonomy (Rosset & Altieri, 2017). Learning about agroecology as a science was a paradigm shift for Matías, a confirmation based on scientific grounding of the diverse ways in which we can understand agriculture. The entanglement between academic knowledge and their own on-going experience was essential for the family's understanding of agroecology and they often referred to specific scholars to support the logic behind their project. This can be observed in the following statement where Matías defines agroecology.

Agroecology implies a healthy diet, a good living condition, low use of energy, the relationships of care and this is not just from the perspective of rural farmers, scientists like the Chilean agronomist Miguel Altieri from the University of California, from a mathematical standpoint, estimate that one unit of agroecological farming is more productive and feeds more people than one unit of industrial farming. We collect millions of kilos less, but we feed more people, around 50% more than in one unit of industrial farming.

Miguel Altieri's and Peter Rosset's (2017) work has been fundamental in agricultural sciences to demonstrate how agroecology increases biodiversity and production yields while reducing hunger through the design of biodiverse pest-stable agroecosystems. Their research group has shown that small-scale farmers produce at least one half of the world's food in just one third of the arable land, showing both that agroecology is not marginal and that it is more productive. Their work suggests diversity of crops in smallholder farms can provide a full healthy diet for 20 people during the entire year from the yields of 1ha of land, using 58 percent less land to produce yields up to 400 percent higher than monocultures (Nicholls & Alteri, 2020). Using the same argument, in the documentary Matías says "we feed more people with this model [of agriculture] than with monoculture, but that this is of no interest". Here, he refers to the dismissal of the work of agronomists like Altieri and Rosset within the agricultural industry, which rather than being excluded for a lack of interest are excluded because they represent an agricultural worldview that escapes corporate control.

When discussing ontological diversity, it became clear the distribution industry has the power to marginalize academic research and local experiential knowledge when the ideas being discussed contest its corporate logic. For this reason, at the beginning of the documentary we included a comparative sequence between an intensive agriculture greenhouse and Antonia and Matías' greenhouse. Images 5-8 below show that comparison. Through these images we wanted to show how the differing agricultural ontologies they represent, produce different relations with other organisms within the productive environment. Image 5 shows Antonia working a living soil with green cover, which we placed in contrast with image 6, showing a monocrop tomato farm where the soil is exposed and sanitized. Image 7 shows Antonia collecting fennel leaves instead of the whole fennel piece. This practice promotes the growth of the plant and allows farmers to harvest from the same plant continuously as the permanent agriculture permaculture design proposes. This growth culture contradicts the standard in the agricultural industry, which as shown in image 8, involves pulling out all crops and sanitizing the soil with herbicides during biological rest periods intended to kill living organisms in the soil, pathogens and non-pathogens.



Image 5



Image 6



Image 7



Image 8

The difference between the two approaches to soil care might not be obvious to people unfamiliar with agriculture. That is what we wanted to revert through the production of images and spoken references to the ‘grass’ growing in their greenhouse. The grass or green cover is home to multiple organisms coexisting at the surface, it also contributes to prevent erosion, improve water catchment and to protect the mycorrhizae, the symbiotic relationship between roots and fungi living in the soil. When an interspecies equilibrium is found, plants can grow all year long as co-existing organisms regulate existing pathogens. Learning to understand life in the soil and how to distinguish between industrial and agroecological uses of soil was fundamental to acknowledge non-human organisms and their resurgences in the different productive environments. Through these images we wanted to make visible the sustained diversity of organisms that is required for the “shift from the sustainable production mantra to sustained ontologies” (Almeida 2017:278).

Economic diversity

Negotiating a diversity of knowledge entanglements, in 2011, the family turned their farm into a permaculture farm, a permanent agriculture design based on agroecology as a growing system. Through this process, they cut all ties with the agro-industry, started practicing polyculture, used seed varieties collected from their own plants and exchanged with friends or with seed banks, stopped all use of external inputs, helped the production of a living soil and started selling locally. The challenge of biological diversity is that the European food safety and traceability regulations, verified by the private certifying companies, exclude agroecology from global networks of production, as farmers cannot pay the cost of certifying their seeds. Matías and Antonia did not have the traceability certificates of the seeds they were planting so they could not sell to any commercializing company. Seeking an alternative, they started going to Granada, where there is a consolidated agroecological network, going door by door asking neighbours to become members of their grupo de consumo Casa Farfara (consumer association Farfara House). They managed to establish the network with local fair-trade agroecological stores and middle-class professionals such as architects, teachers and public sector workers who were willing to become members purchasing the veggie box monthly. This finally made their project financially sustainable, and they started seeing the possibilities of economic diversity.

The discussion with Antonia and Matías to visualize the second part of their journey, revolved around the tensions generated by their financial debts and the ways they relied on community networks to find an economically sustainable alternative for the family's agricultural project. We decided to visualize their process towards economic diversity through the images below, representing different segments of the documentary. Image 9 shows Antonia collecting beans from the farm for the meal she is about to cook, and image 10 shows two members of the consumption groups, talking in the farm as they collect their own veggie box. Images 11 and 12 show the exchange of seeds and a volunteer of the consumer group making compost.



Image 9



Image 10



Image 11



Image 12

Antonia and Matías considered that the first step to attaining economic diversity was food sovereignty, understood as the right of people to reclaim the sustainable and accessible production, trade and consumption of food. Through these video sequences, we wanted to make visible key aspects of food sovereignty. Being self-sufficient and finding alternative routes of commercialization was essential for the family to recognize the existence of ‘diverse economies’ (Gibson-Graham, 2008), allowing for an alternative to capitalist development. We also wanted to show that seeking economic diversity in agriculture requires input independence. This is a process that requires the exchange of seeds among communities of agroecological farmers, activists, seed banks and the homemade production of necessary agricultural inputs, such as compost. The complex ways of attaining economic diversity are not discussed in the documentary through the voice over, as we chose to give preference to the indebtedness and eviction process most farmers can empathize with. However,

the glimpse to resource independence, food sovereignty and direct sale to consumers provided by the images above, serve to inform debates on sustainability and economic diversity.

Political diversity

Their consumer association grew gradually, accompanied by similar consumer associations, like the grupo de consumo El Taray and similar agroecological projects, like that of Jesus and Constantino, two agronomists who are also farmers in the region practising biodynamic and agroecological production. Connecting with other farmers and consumers who were also seeking diverse sustainabilities made Antonia and Matías feel they were not alone. They remember the eviction period with great sadness, but they took comfort in the networks that were being built around them. When the Via Campesina delegation contacted the SAT, these immediately organized their visit to Antonia and Matías' farm, as they had become the regional referent of agroecological production. In contrast, the local agro-industry and the local media never contacted them to discuss their project and their farm neighbours continuously sabotaged their production by using herbicides on the margins, verbally harassing them, and exposing them to pesticides, as these were heavily applied in the neighbouring greenhouses and killing several of their dogs.

This led them to a second rupture with the agricultural industry, this time taking physical distance and displacing their permaculture project to Almócita, a village in the Alpujarras Mountains. Almócita received the 2020 CONAMA sustainability award for towns under 5.000 inhabitants. Its council promotes social and environmental sustainability, defending permaculture, agroecology, food sovereignty and energy self-sufficiency and it is an institutional member of the Red Terrae, the Intermunicipal Association of Agroecological Reserve Territories and the rural social movement *Pueblos en Movimiento* (Villages in Movement). Today, Matías leads the village permaculture farm, offering courses and setting off to build the first permaculture cooperative of Spain, while his daughter leads the village's *Proyecto Bosque*, aiming to

reforest the surrounding mountains, helping companies offset their carbon footprint and preventing further desertification. They also have created the participatory guarantee system (PGS) of the Agroecological Network of Almería, whereby the network's consumers certify the quality of local products and modes of production. PGS is an alternative to third party certifications that have been used in agroecological networks since the International Federation of Organic Agriculture Movements (IFOAM) International Workshop on Alternative Certification in 2004.

Understanding political diversity, much like economic diversity, was central to the collaborative discussion with Antonia and Matías through the making of the documentary. As Henrietta Moore suggests, multiple ontologies are not, “versions of the world, in the sense of differing representations, but historically and experientially located forms of engagement” (2017:73). Matías and Antonia joined historical local and global struggles to sustain their livelihood. These included diverse forms of engagement with organizations like the SAT, Stop Eviction Platform, Ecologists in Action, Via Campesina, the Agroecological Network and Pueblos en Movimiento, among others. All these movements share the need to accommodate and help each other in visibilizing injustices through public demonstrations and discussions as seen in images 13 and 15, and through affective ties and associative work as shown in images 14 and 16. In this sense, political diversity should be seen as dynamic interrelations that open a space for, and enact, a multiplicity of worlds. These interrelations do not follow a single spatial-temporal framing and often derive from ontological struggles because they “interrupt the globalizing project of fitting many worlds into one” (Escobar, 2017:239).



Image 13



Image 14



Image 14



Image 16

Image 16, showing Antonia hugging a relative and Matías and his son crying at the goodbye ceremony, served to highlight the emotional bonds and processes of human rupture involved in the struggles that seek to accommodate a diversity of worlds. We wanted to show that struggles are not fixed to places; they change through time and space in response to the trauma and support shown by the communities in which they are immersed and by other organisms co-existing in their environments. By placing the focus on the goodbye scene as a narrative strategy for the documentary, we sought to deepen on the participants emotional bonds to the land, showing their distress for the lack of space for political diversity in western Almería that led them to displace their agroecological struggle to a new village.

Biological diversity

As the family settled in Almócita, Matías came to define what they do as emotional

agriculture. He recalls,

“As we started planting [in their new farm in Almócita] we started building a connection with the environment, but one day I drove to the bank to check my accounts and the bank had charged me 200 Euros by mistake. I was angry and when I got back to the farm, I saw that wild boars had dug three holes next to a padrón pepper plant. That month I got detached from the farm and a month later, when I went back to the bank, I had the same mistaken 200 Euros charge and the wild boars entered the farm again, only this time to rip off the padrón pepper plants. It was weird to have these events on the same day and have the wild pigs attack the same plants. Still one month later, in the middle of the night, I woke up with an urgent need to go to the farm. It was 4am and with pyjamas and slippers, I got into the car and as I arrived, I saw the wild boars running away after destroying half of the crops. That is when I told myself, you have broken the equilibrium. You cannot show affect for the land and build a relationship with the organisms within and then abandon that space. It is a bonded relationship that requires continuous care and affect, that is why I call what I do emotional agriculture.”

Matías’ understanding of emotional agriculture brings interspecies relationships to the foreground. We are still discussing how to represent this story visually and the ways we can include it in the documentary narrative. Antonia and Matías negotiate different types of knowledge alongside the patient, long-term observations of “the dynamics of multispecies resurgence”, as these have been sustained or blocked by different production models across generations (Tsign, 2017:51). When I suggested to cut one of their plants since it was infested with aphids, Matías explained that if we were with his father, the plant would have already been cut, while according to intensive agriculture he should have already used pesticides, but now he had seen that it was best just to leave the plant as it is. Pests are all around, but they only harm your crop when they do not receive nourishment from an alternative source in that

ecosystem. If you give them a place to be, the aphids feed from the plant, but they rarely spread, and if you wait long enough, a predator will come and clean the plant without you having to do anything.



Image 17



Image 18



Image 19



Image 20

The ways in which nature resolves its own imbalances was central to our discussion on making biological diversity visible. Image 17 above, shows the symbiosis of plants and snails in the productive environment in the form of a macroscopic demonstration of the continuous interrelation of organisms taking place on the soil at microscopic scales. Image 18 shows a chicken living in Antonia and Matías' farm, who plays a major role decomposing organic matter that serves to feed the multiple organisms living in the soil, including the plants. The care Matías and Antonia have for visible and non-visible organisms is derived from an acknowledgement of their central role in the creation of liveable environments that generate the food that feeds us. For years, they have embodied that relationship by drinking and cleaning the skin with the same

liquid microorganisms they use at the farm and believe these have the same ability to create microbial equilibrium in their bodies as in the soil. Visualizing such human–nonhuman exchanges and sympathies based on mutual relationships of care has proven difficult, if not impossible. Yet, we wanted to highlight that care is fundamental to understanding such relationships, as it will determine how communities organise themselves and how that organisation leads to alternative livelihoods.

As humans, we have to show our care for agriculture designs that enhance resurgence. This is what we tried to show in images 19 and 20. Image 19 shows the overhead shot of Antonia and Matías intercropping design in their new farm in Almócita, and image 20, shows Matías explaining why he planted different non-edible species next to each productive crop, according to their different needs. Fostering biodiversity is a complicated endeavour that requires prolonged observations, deep thinking and interspecies care. What we wanted to claim with these images is that biological diversity allows food systems to adapt and to change more dynamically through the action of multiple organism, and that a meaningful approach to sustainability serves to enhance rather than prevent diversity.

Conclusion

In an agricultural industry that is increasingly multimodal, using film, video, sensors, aerial vehicles and satellites sending data straight to farmers' smartphones, Antonia and Matías saw in our collaborative documentary a possibility of offering an alternative visual narrative to the future of sustainable agriculture and sustainable livelihoods in the region. Visualizing alternative cultures of sustainability contributes to strengthening affective ties between farmers and the natural environment. This is consistent with the notion of 'conservation from below' (Sandbrook 2014), the ethics, values and practices that promote a healthy relationship between humans and nature. Adams suggests the anthropology of sustainability should be attentive to the ways in which conservation from below can challenge conservation from above, because "the

question of whose version of conservation comes to dominate is central to the future of nature” (2017:120).

As Brightman and Lewis propose, this requires “re-imagining and reworking communities, societies and landscapes, especially those dominated by industrial capitalism, to help us build a productive symbiosis with each other and the many nonhumans on whom we depend” (2017:2). Antonia and Matías’ story is one example of how communities are actively engaged in a process of reworking. They have reworked their modes of production, association, consumption, care and affect for humans and nonhumans, as their farming evolved from intensive production to ecological production, to agroecology, to their current model, emotional agriculture. Unarguably, they are the exception in the agricultural industry, but their case is significant because it exposes the diversity of knowledge and practice in the understanding of sustainable agricultural futures across different modes of production.

A key purpose of the documentary is to create a narrative, based on a critical local discourse that has brought into being an agriculture aimed at reversing the “ecological superiority of humans and the cultural superiority of men” (Mallory, 2010:309). The film describes the interlinked processes that generate the social and economic conditions for unjust and unfair living on an autochthonous family farm. It uses an insider perspective to examine the industry and the directions in which it could potentially change in order to reduce the impact of climate change, and establish interlinked social and ecological sustainable practices. From the same perspective, the film proposes an alternative way of living and invites the audience to consider the negative generalising characterisation of farmers as a covering explanation for the systemic hierarchical oppressions that affect the lives and agency people all along the chain of production.

Through the collaborative conceptualization and production of the images described above, we have attempted to build an empathetic engagement with the practices and

processes Antonia and Matías have experienced in their journey to attain meaningful sustainability. The documentary's rough-cut and the rest of the filmed material has served as a shared activity through which we collaborated on the meaning production of sustainability futures. As a multimodal tool, it serves as a vehicle to rethink the representation of sustainability by engaging with local actors to build on the notion of multispecies resurgence. The images presented here make visible the subjective sensory and affective experiences and imaginaries involved in the process of taking responsibility for resurgence.

Chapter 4

Natures in Tension in Western Almería's Agro-Industrial Adoption of Biological Control: Inclusion Barriers, Local Knowledge and the Conservation Approach

Introduction

Drawing on constructivist knowledge theory, which situates knowledge production in specific contexts, this chapter investigates the processes of local knowledge inclusion and exclusion in western Almería's intensive agriculture industry (Šūmane et al. 2018; Raymond et al. 2010). I focus on the (de)valuation and marginalisation of women's and migrants' locally generated knowledge produced at the lower echelon of the intensive agriculture chain. The chapter is informed by the experiences, narratives, social interactions and work routines of the informants, as well as the diverse interactions they engage with to exchange or acquire knowledge. Local knowledge refers to corporeal, tacit, experiential and endogenous understandings derived from the social, political, economic and environmental relationships people engage with in the areas where they live and work (Beckford & Barker, 2007). Furthermore, the chapter seeks to unpack marginalised forms of local knowledge production that account for our dependence on nature and our interdependence as humans, and which could therefore serve to promote sustainable agricultural practices that address interlinked social, economic and ecological problems (Herrero, 2013; Pretty, 2008; Ikerd, 1993).

I argue that the decrease in the adoption rate of biological control in the tomato crop since 2009, from 90% to 80%, is a result of the exclusion of knowledge generated

locally by farmers, women, migrants and workers from the design of adoption protocols. I suggest that the inclusion of marginalised local knowledge would promote situated and sustainable agricultural practices that would achieve longevity in the region. The great 'retroceso' (retreat) in adoption, as it is characterised by local agriculture scientists, is not so much due to the inadequacy of farmers, as those scientists may purport, rather it is due to underlying industrial structures imposed on farmers, labourers and the natural environment. However, it also reflects a conscious decision informed by those workers' diverse forms of local knowledge. The aim of this chapter is to explore how farmers relate to biological control as a production technology and how inclusion and adoption are negotiated socially and ecologically. I will pay attention to marginalised forms of local knowledge that are particularly excluded from the industrial and scientific analysis and from adoption protocol. These include: women's knowledge, ecosystem knowledge, agroecological knowledge, migrant knowledge and family farm knowledge.

The first section of the chapter will unpack the ways in which the interactions between agents of local knowledge affect how technology and nature-based solutions are adopted across the productive structure. Taking the 'revolution' of biological control in Almería's agro-industrial region as a case study, I will focus on the adoption of 'good' insects to combat plagues, as a substitute for pesticides in the greenhouse. In 2007, with the mass adoption of biological control in Almería, the idea that 'insects can be good' reconciled the industry with organic life, becoming its commercial banner. However, this has not translated to a unified way of introducing and collaborating with natural enemies in the greenhouse. The challenges experienced by many farmers in controlling plagues, such as pest transfer from their neighbours through the greenhouse ventilation windows, have led many to discredit scientific recommendations, as they perceive an empirical failure.

Biological control in Almería is chosen because it brings the scientific possibility of a sustainable future to commercial agriculture, yet it is met with scepticism for its temporal unfeasibility by some farmers, given the current risks of production. Such

constraints often make farmers feel excluded from biological control, who consider it a top-down technology that prioritises the demands of the European market and certifying companies, a technology to which they can't afford to commit. The aim of this section is to expose the inclusion barriers faced by farmers and labourers when adopting new technologies, and how these barriers could be surpassed by seriously engaging with those workers' experiential knowledge. I will define how specific social, economic, personal and psychological factors constrain local agents of knowledge, and address the disparity between the different modes of understanding biological control.

The second section builds on the growing recognition that paying attention to marginalised and overlapping sources of local knowledge, including family farming knowledge, women's knowledge, migrant's knowledge and multispecies knowledge, can help the workers involved in agriculture to become resilient and move towards social, economic and ecological sustainability (Šūmane et al. 2018:233). Without green corridors or biodiversity islands that support the breeding of 'good' insect communities from one harvest to the next, farmers are continually exposed to plagues.

The few scientists advocating for biological control to sustain the auxiliary fauna through the conservation of public wilderness spaces are working to revert the regional view of nature as 'artificially produced', showing how "individuals and collectivities are compelled today to hold various natures in tension" (Escobar, 1999:2). Such ontological and epistemological transformation in the regional agriculture sciences, and in the local understanding of nature-as-a-technology, is linked to natural imbalances and reveals the existing tensions between local and expert knowledge. This section will examine the ethos of conducting biological control through conservation in the intensive production model, in contrast with the narratives of those few farmers who have consciously stepped out of the industrial machinery due to the impossibility of combining natural rhythms and human care with intensive modes of production.

Inclusion barriers and the potential of farmers' knowledge in biological control adoption models

One of the farmers I conducted research with in western Almería kept repeating, “we are the ones who have transformed the desert into an edible jungle through the work of our bare hands”. This was a recurrent statement among the different farmers who informed this research, including intensive production farming businesses (those who operate the farm like a business, sourcing industrial inputs and external labourers), intensive production family farmers (those who integrate the farm with family, requiring family participation in the production process, but who are fully dependent on external inputs), test-run farmers (those who plant test varieties for private agriculture companies or research centres) and agroecological farmers (the exceptional few who adopt practices based on care for nature and non-intensive production, such as permaculture). The different types of farmers were all generally proud of the transformation made possible through the hard labour of local inhabitants. Like the Israeli desert farmers studied by Hurwitz et al. (2015), farmers in Almería have made the multi-generational effort to adapt agricultural labour to desert conditions, a symbol of their hard work. What distinguishes them, however, is their interpretation of the role of transnational agriculture companies in setting the example for the dominant form of intensive greenhouse agriculture, which brings with it a dependency on external inputs and technologies. These technological interventions have operationalised nature as a “raw material”, taming the desert and redirecting its functions towards intensive industrial agriculture, a pattern that agroecological farmers in particular are trying to move away from (Shiva, 2015:388).

The introduction and widespread adoption of plastic greenhouses in the 1970s allowed the traditional family farmers to maintain a steady production period of up to ten months a year, by adjusting climate parameters such as sun exposure, temperature and humidity. Gradually, natural resources such as water, soil, nutrients and seeds have become commercial products, which farmers need to purchase at the beginning of every harvest, often through bank loans. The autochthonous model of

family farming has become the testing ground for production and input companies who use the local workforce and greenhouses to test their new market varieties. This process has brought about the farmers' resource dependency, the marginalisation of autochthonous family farming know-how and a transformation of family farming practices.

The analysis presented is the result of a 12-month ethnographic fieldwork period in El Ejido, the commercial centre of Almería's agro-industrial cluster. During this time I conducted participant observation with the farmers, labourers and extension workers of 10 family farms, operating in the region by male and female farmers with different production models, including: intensive, testing site, ecological, pedagogical, biodynamic and permaculture. I also conducted formal interviews and field visits with scientists from four local agricultural research and innovation centres, as well as with labourers, sales agents, communication administrators and biologists from four commercialising companies, where farmers' produce is packaged, sold and transported to their destinations across Europe. The agents of local knowledge that were studied include scientists, extension workers, farmers, women and migrants, who besides being familiar with global economic flows and cutting edge agricultural innovation, possess understandings of both traditional and intensive practices and ways of being.

In the field the most common definition of biological control I found among farmers was the use of *bichos* (bugs) to combat plagues. This general interpretation has served to label biological control as a viable option for addressing one of the biggest problems in the greenhouse: insect pests eating and destroying the crops. It's an interpretation supported in the existing literature, where classical biological control is defined as "the use of living organisms, usually from a pest's area of origin, to control the pest in an area where it has invaded" (Cock et al. 2009:4). Like the local interpretation, this definition could include the introduction of invertebrate species (natural enemies) to control the invasion of highly proliferating foreign invertebrate species (pests). This definition goes a step further however, by acknowledging that

both are externally introduced to the production environment.

More holistic definitions refer to biological control as “one of the major ecological forces of nature, *the regulation of plant and animal numbers by natural enemies*” (DeBack and Rosen, 1991:32). This branch of the literature is more sensitive to the instrumentality of plant-animal relationships for the balanced living of diverse populations in the fields. Moreover, it is suggested that such interspecies interactions not only take place on farms, but also in the natural environment as a general ecological phenomenon. Paying attention to existing interactions between plants and insects in the natural environment has been the scientific basis for biological control. It therefore seems logical that the practice would continue to be characterised by an attention to naturally occurring interactions and the ways in which human can help those interactions.

Despite the differences between these definitions, one casting biological control as a farming method and the other casting it as an ecological force, they both make reference to a nature-based control or regulation, whereby the auxiliary fauna population (the ‘good insects’ or natural enemies) is adjusted in proportion to the existing plagues. Yet, what they fail to acknowledge is the role that humans play in fostering such regulation, first by introducing the right kind of natural enemies and second, by monitoring, feeding or trimming the natural enemy populations as the pest disappears. They also fail to discuss the differences in financial stability, motivation and sustainability consciousness that bring farmers to use biological control as either a solution-oriented farming technology or as an ecological relationship between the living organisms co-existing at the farm that needs to be balanced in accordance to each species’ needs.

Taking the first definition, that of biological control as a farming method, this section will consider the inclusion barriers experienced by farmers which impair their adoption of biological control. Inclusion barriers refer to the factors that farming communities find important in their process of adopting biological control, but which

are not necessarily accounted for by local scientists and are therefore left out of adoption models for industrial biological control. Biological control scientists focus mostly on finding a natural enemy for a given crop predator, taking a functional approach out of the necessity to find substitutes for existing chemical-based pesticides. This often results in a lack of attention to the cultural, social, ecological and financial aspects that keep farmers from adopting biological control. This section discusses some of the adoption variables that have been invisibilised by the functional scientific literature used to design the industry's biological control adoption models, among them resilience, social relationships, financial stability, harvest insurance, technical training in biological control, cultural farming practices and nursery contagion.

Biological control as ecological resilience in western Almería

The majority of regional farmers take pride in the self-sustenance of their community and the transformation of the desert landscape into an intensive vegetable production site. Self-sustenance in this case does not entail sustainable practices, simply an adaptation to industrial production and price demands over time while maintaining one's business. As farmers negotiate new types of knowledge and market exigencies with their experiential and community-based understandings of, for example, climate or price fluctuation, new methods and practices emerge as critical objects of a continued survival in the agricultural system (Folke et al. 2003). This ability to "absorb disturbance", transforms their agricultural practices and allows them to adapt to new criteria and value systems. Agricultural subsistence characterised in this way is what the literature refers to as resilience (Walker et al. 2004:2; Gunderson, 2003:34).

Building on personal experience and each other's knowledge is fundamental for the long-term sustenance of family farms, and also for the acceptance of human interdependence within the productive environment. This collaborative trait of family

farms' resilience has already been addressed in the literature (see Darnhofer et al. 2016), but it should be noted that this type of resilience is about maintaining efficiency rather than ensuring the long-term continuation of the agricultural system. It could be argued that it is an "engineered resilience", whereby a single, simplified ecological equilibrium is designed and held up as the system's objective (Holling, 1996:33). The problem with this type of functional resilience is that by setting a course for a one-dimensional equilibrium it ignores social, financial and ecological diversity, passively delegating the burden of dealing with disturbance to the lower echelons of the agricultural chain, forcing farmers and workers to absorb any given disequilibrium.

Many farmers absorb the financially unsustainable low prices of the European vegetable market by placing the burden on themselves and their workers through low, racialised salaries and abusive labour practices, creating a socially unsustainable labour system. They also absorb the demands of unwavering, standardised vegetable production through the persistent use of external inputs like commercial manure and pesticides, which in turn pollute and kill the living organisms in the soil. Farmers are not inherently exploitative towards workers and nature, but they are forced to engage in these practices in order to cope with financial hardship and production risks that drive them away from the industrial equilibrium.

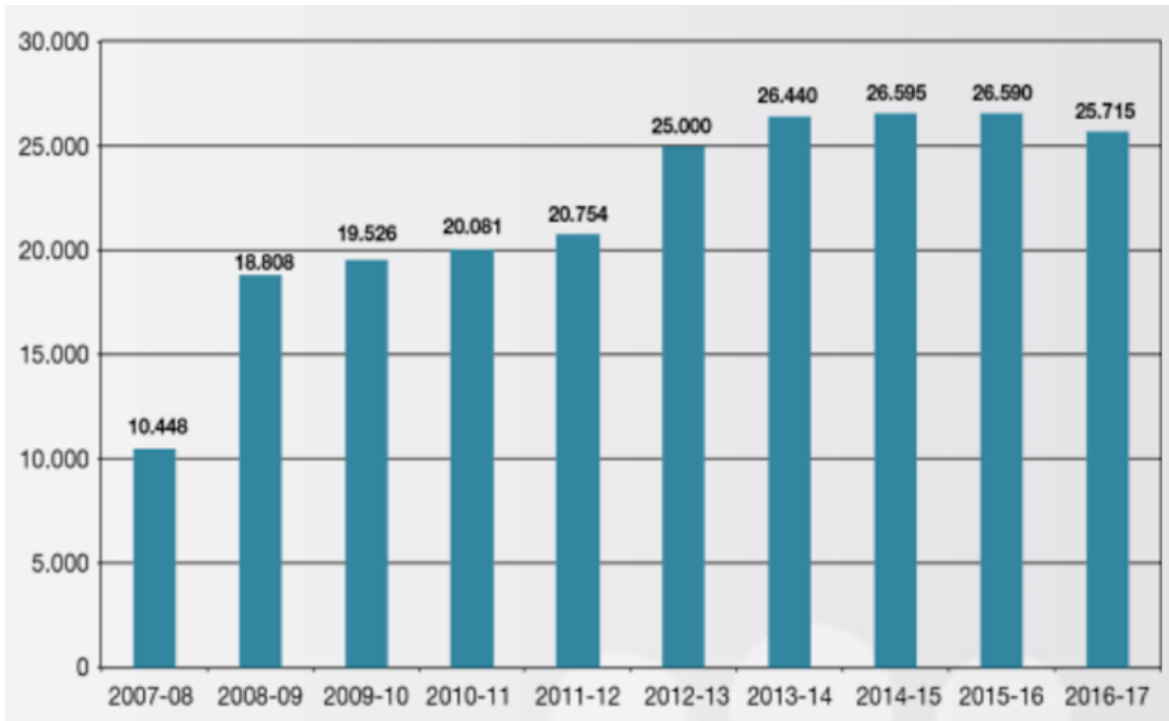
These practices are not static. They differ from traditional regional farming practices and change according to European regulation and the different community-based and external pushes towards ecological and sustainable production. When regional agriculture started in the 1950s, farmers grew their crops along with chickens, goats and sheep. This gradually changed between the 1970s and early 2000s as the notion of food security emerged and animals were forbidden in the crop environment. As foreign pests started emerging and pesticides became both available and also required in order to maintain stable crops, insect life was also threatened within the productive environment. With the turn of the century, the European Union began filtering out produce with pesticide exposure above the established Maximum Residue

Limits. This was a regulation that started being taken seriously in Almería in 2006, when the region's produce set off fifteen sanitary alarms across Europe.

The German sanitary alarms detected levels of *isofenphos-methyl* and *oxamyl* above the EU's Maximum Residue Limits levels (MRLs)³. The residues were detected in half a ton of peppers coming from Almería in 2006, leading to a 15% decrease in sales. The event was a key motivator for the chain adoption of insect-led plague control (Pardo Losilla, 2010:105). While less than 500 hectares featured biological control in the 2006/07 harvest, this had increased to 25,715 hectares by 2016/17. In the case of some crops the increase has been steady, like peppers, where the use of biological control is now at 99% (Van der Blom, 2017:34). Crops like tomato, watermelon and melon, however, have experienced periods of decreasing application of biological control. In the case of the tomato, only 80% of plantations now use biological control, representing a downward trend that has been ongoing since the 2016 outbreak of the pest moth variety *Tuta absoluta* in Europe (Desneux et al. 2011; Tropea-Garzia et al. 2012; Desneux et al. 2010). Being the largest crop in the region, the decrease in adoption and the doubts about *Nesidiocoris tenuis* as the best natural enemy for *Tuta* have shaken the notion of biological control for the tomato, interrupting the general trend of the industry as shown in the graph below.

³ More info on MRL in EU Pesticides database: <http://ec.europa.eu/food/plant/pesticides/eu-pesticides-database/public/?event=homepage&language=EN>

Graph 1: Evolution of total cultivated surface using biological control in Almería (hectares)



Source: Cajamar (2018). Data from agriculture and fishing council, Junta de Andalucía

Even if farmers show pride in the efforts carried out for the mass adoption of biological control in the region in 2007, known as ‘the year of bugs’, the application of biological control precipitated a chain of disequilibriums that farmers still struggle to absorb. This was a liminal period in the sense that they were caught between the socially accepted use of pesticide to combat plagues, and the progress of the industry now pushing against pesticides in favour of biological control. First, they had to acknowledge that managing insect populations proved difficult in their chemically polluted farming environment. This entailed financial hardships and indebtedness when they were unable to control the pest with natural enemies due either to the difficulty of introducing them in the greenhouse, exposure to contagion from neighbouring crops, or external contagion at the nursery. Even while failing to eradicate pests and losing their investments, farmers were expected to commit to continuing the use of biological controls without reverting back to pesticides, thereby

avoiding the development of resistances and mutations in pests (Martínez Aguirre, 2007: 110).

Scientific understandings of the underlying reasons for technological failure and poor management by family farmers

José, one of the farmers I worked with in the field, hints at the various difficulties that farmers experience with biological control. In one of his farmers' WhatsApp groups, he summed up how he dealt with the disequilibrium resulting from the use of *Nesideocoris* as a natural enemy to combat Whitefly and Tuta pests.

José: As for the tomatoes, because of Nesi I ended up with the whole farm full of virus. The Whitefly was faster than the Nesi. Between the tomatoes and Nesi, that's 5000 euros down the drain. I'm not going to say that Nesis are bad, but I got fucked, and this year I managed to have a tomato harvest without biological control and almost without viruses.

José went into biological control because he was seeing his friends, colleagues and neighbours having positive experiences. Ultimately he knew it was better for the environment, and for the sale of his produce to the European market, to use fewer pesticides in the greenhouse. However, his decision to adopt biological control came because he saw there was a wide acceptance of this new farming tool among the members of his community. Talking to his peers, he was able to compare family farming knowledge with the new techniques and practices being introduced, identifying new production resources, practical solutions and sources of inspiration (Šūmane et al. 2018). For instance, the brightness and flexibility of his neighbour's plants under biological control, in contrast to the cardboard-like texture of his own plants' pesticide-covered leaves, served to inspire José while playing on his sense of competition.

However, the practical deployment of insects, their introduction in the greenhouse environment and their careful monitoring, to ensure the advantage of the natural enemy population over the pest, were all difficult endeavours for him. Ultimately, he had to abandon the tomato plants and lose his investment. The investment came from a pre-harvest bank loan, as is the case for most investments in the region, and losing his crop meant not generating the money to pay it back. Having opted to go without costly harvest insurance, José had to ask for a new loan to pay back his lost investment and buy new seeds. As he had already made an extreme economic gamble on biological control for his 1 ha family farm, he turned back to pesticides to minimise production risks. José had been using pesticides ever since he started learning about farming with his father, so he was certain to control the pests with this method. This impaired his ability to pursue biological control in the future, due to both a fear of failure and a more polluted greenhouse environment where pesticides would kill both good and bad insects.

Scientists are not unaware of these issues. At one of the scientific seminars I attended in the field, the director of production techniques from the Association of Organisations of Fruit and Vegetable Producers of Almería (COEXPHAL), Jan Van der Bloom, stated:

Jan: Biological control is an obligation in quotation marks because there are many authorised pesticide products registered, allowed and accepted, so in that sense there is no obligation. When you see 10% of plants with virus, compared to 5%, I fully understand that people become nervous, and more so when managing *Nesidiocoris*. It gets tough. There are plagues that today we do not solve well with biological control.

Monica González, the PI of the Biodiversity Island Project and Cajamar's lead researcher on biological control, who had been tasked with carrying out a study to evaluate alternative biological control organisms to *Nesidiocoris*, given the controversy and the observed decrease in its use, replied to Jan:

Monica: Reality is stubborn. There is no plan B as many people presume. This is the plan that must be followed: we have to keep investigating and improving, but we cannot reverse what we have already achieved because it is clear that we are going to make a mistake, and we are going to find ourselves with the same reality that we had years ago. It is not by chance that Nesidiocoris is used; it has taken many years of research by the insect houses and research centres. I am convinced that we are not going to discover anything new at all, but there is an opportunity to remember that in addition to Nesi we can use other complementary natural enemies. This will add more complexity, which is not bad, because in the end, in agriculture, like in our own lives we tend to simplify everything. It takes hard work to use complex strategies where we have to combine different things. The conclusion is that we cannot abandon biological control. The alternative will not work. It is a reality, it will not work. It can give us a fix for some time, but in the end we will return to biological control.

Biological control is about helping to restore and balance natural cycles, but how to do that in an environment where active substances are present at different biological levels, and where you cannot identify the source of contagion until it is too late? Farmers are conscious of the challenges of doing biological control in a partially toxic environment, where a single individual's effort to revert such toxicity leads to a downward spiral, both in economic terms but also in the emotional sense. Without standardised regulatory measures and protocols, the region becomes a collective laboratory, and each farmer, with their particular field experiment, tends to develop a personal logic that they apply to the use of biological control, or to their disavowal of it based on their inability to absorb risk. The scientific assertion of facts, in contrast to the experiential knowledge of farmers, provides a new set of questions regarding the practical logistics of making Nesidiocoris work.

Hierarchies of knowledge and the marginalisation of local family farming knowledge

Family farms gather knowledge from a multiplicity of sources, including personal experience, informal farmers' debates, formal talks by scientists and extension workers, and the industry's communication campaigns at fairs and events (Beckford and Barker, 2007). They actively collect and assess knowledge using their agency and experiential knowledge of nearby farms to assert and define the specific way in which they will employ a new technology or method. The practical experience of farmers working under the same conditions makes them "reputable experts" in the eyes of their peers, as they uphold situated and practice-based knowledge (Šūmane et al. 2018:237). Once farmers' and scientists' knowledge has been gathered together, the external information sources need to be validated and adapted to the concrete conditions that pertain to a given farm (Kaup, 2008; Stuiver et al. 2004). This combination of formal informal knowledge serves to negotiate external agendas and expectations of production defined by European regulations, local scientists, private certifying companies and large supermarket chains, as set against farmers' experiences and local understandings of market expectations.

However, the industry and its scientists rarely use farmers' knowledge and experiences to represent the industry or in the advancement of formal regulations (Maderson and Wynne-Jones, 2016). Instead, they appropriate success stories, de-contextualising local knowledge and undermining the complex relational knowledge structures that emerge from self-organised, local networks (Wood et al. 2014). The processes of specialisation and technification in Almería's agricultural industry concentrate the "right" knowledge in the hands of a few local scientists, who through their scientific certitude and authority minimise the relevance of situated farmers' knowledge (Šūmane et al. 2018:235). This assertiveness in turn frustrates farmers who have made the industry's success stories happen, and who do not receive individual recognition for the value of the produce (Rodrigo and Ferragolo da Veiga, 2010; Fonte, 2008).

Existing communication dynamics and power asymmetries make it difficult for the complex farmers' analysis to receive scientific consideration (Noe et al. 2015). At the previously mentioned seminar attended by Jan and Monica, although at least five of the farmers with success stories were in the audience, they were represented on stage by two cooperative agronomists. Serving as mediators, the agronomists tried to convey farmers' concerns, yet rather than creating a dialogue, the scientists worked to dismiss the agronomists' arguments by maintaining that there was no alternative to the studies and solutions already provided. The asymmetry of knowledge integration undermines farmers' arguments, impairing the development of a multi-actor knowledge base that would improve resilience (Tisenkopfs et al. 2015). Such approach to ecosystem management aimed at fixed solutions and constant production hinders resilience and promotes the generation of "myopic" and "static" industrial knowledge, which makes farmers vulnerable, suspicious and sceptical (Holling, 1996:36; Gunderson et al. 1995; Gunderson, 2003).

The existing hierarchies of knowledge create normative modes of thinking within the regional agriculture research centres, promoting an "undisputed intellectual hegemony" (Kloppenburger, 1991). This contrasts with the existing literature, which argues that combining farmers' and scientists' knowledge in a democratic manner is best for building resilience (Clark and Murdoch, 1997; Ingram, 2008; Pretty, 2008; Fonte, 2008; Lyon et al. 2011; Leh_ebel-P_eron et al. 2016). Scientists need to recognise the alienation from nature and traditional knowledge experienced by farmers over the many years of dependence on external inputs (Timmermann and Felix, 2015; Ingram, 2008). It is advised to create new adoption models for scientific advances, models that redress the reductiveness with which the industrial system has regarded local knowledge, in order to place farmers and their traditional know-how back at the core of production design (Šūmane et al. 2018:235).

Paying attention to collaborative learning, mutual support and local understandings of the industrial system and its environment is essential to advancing sustainable

models that promote ecological resilience (Curry and Kirwan, 2014; McKenzie, 2013). This implies acknowledging the diversity of ecosystems, aiming for more than a single one-dimensional equilibrium, and acknowledging the limitations, from a human perspective, of controlling single ecosystem variables (Admiraal et al. 2013; Peterson et al. 1998; Chillo et al. 2011; Holling et al. 1995). Focusing on how to manage instability, as opposed to demanding equilibrium, better addresses existing problems faced by farmers and allows them to find solutions to disequilibrium. As Holling suggests “effective control of internal dynamics at the edge of instability generates external options” (Holling et al. 1996:41).

Negotiating local farmers’ knowledge and the possibilities for the creation of sustainable multi-actor engagement

Looking at the responses on WhatsApp to José’s aforementioned testimony about his difficulties with biological control and his return to pesticides, it is clear that farmers are aware of a multiplicity of instabilities associated with biological control that scientists should be addressing.

Paco: Could it be that you had residues from the nursery? Unfortunately, we are paying the piper... If the seedbed is treated with a residual product, it does not matter how many times you replace the Nesi or any other auxiliary insects, because in the end, they die.

Jose: A couple of years ago, a friend released Nesi at Biosur nursery and when he planted the tomato in the greenhouse, he began to see viruses and Whitefly. The agronomist did a leaf analysis and he found pesticide residues, but nobody took responsibility.

Juan: People are afraid of the Tuta. I am clean, I have killed all the adults and the nests are dead.

Manolo: What have you treated them with?

Juan: A lot of Nesi, and for the adults I used the light traps, and a water and oil

canister with their pheromones inside. Now I have at least ten Nesi in each tomato head, and they are hurting me, eating all the sprouts.

Paco: Do not follow the madness at this time of year of putting out a treatment to lower the population. You are dead without Nesi.

Juan: That's true, my neighbour made that mistake last year.

Paco: 15 years ago, Nesi were worth €4,000 for 1 ha, now they are worth €500 and people still say they are expensive, so they go on with the pesticide treatments. Then, at the end of the harvest the incidence of virus is 80%. A lot more than the 40% incidence when using Nesi even if you are a bad farmer with poor technical advice. Also, think of the sheep that eat the stems and tomatoes that we throw, or what eats the grass at the edges of the greenhouses, which have been treated with herbicides. Even if the farmer has spent a month without applying pesticides, the residues are still in the ground and the animals ingest it, and in the end the sheep carry the residues to our farm without knowing or meaning to. If what we compost has residues, in the end we will have residues of chemical matter.

Farmers collectively recognise that failures in biological control are not simply due to mismanagement by individual farmers. The implementation of *Nesidiocoris* is not easy (Amor Parrilla, 2013:19). It requires timely releases at the nursery stage, as well as supplementary nutrition of the growing population, with larvae eggs, for example, due to the high proliferation of *Tuta* (Gabarra et al. 2014:13; Urbaneja et al. 2009; Calvo et al.2012). While most nurseries offer the service of segregating natural enemies when farmers require it, the proximity of those batches where biological control is used to those where it isn't makes cross-contamination and residue exposure a consistent threat. This is especially the case for natural enemy populations that require intensive care, like *Nesidiocoris*.

In the nursery, plants come into contact with thousands of plant batches from farms all over the region. It is where plants experience their first social interaction, namely with their neighbouring trays, the mediation of which depends on the training and

care put in by the nursery's workers and farmers, exemplified in the decision to use auxiliary fauna or not. The nurseries are not able to monitor how the *Nesidiocoris* populations are established, nor can they determine precisely when the populations of each batch require supplementary feeding with larvae, which puts in jeopardy their survival during transplantation to the greenhouses. These problems persist due to the lack of responsibility taken by nursery houses, so farmers continue to be exposed to plagues, as in the incidents with Tuta and Whitefly described above.

Even when plants are not exposed to pesticide residues at the nursery, they risk exposure through greenhouse soil, irrigation and animal compost. The *Nesidiocoris* population reaches a steady growth level in August and September. During this period, farmers rent cattle from nearby farms to eat the remaining grass, leaving behind residues from other locations. They also carry out biological rest periods using chemical soil pesticides that kill the surviving *Nesidiocoris* population (Tavella et al. 1997, Perdakis et al. 2007). The resulting residues weaken the population of young specimens that come with the seedling from the nursery, and also pose a threat to new releases made by the farmer. Furthermore, exposure can come about through irrigation due to the long-term pesticide pollution of local aquifers, and via wind transportation if pesticides are applied on neighbouring farms.

Even when the *Nesidiocoris* population persists and is able to fight the Tuta plague, the problems for farmers are not over. Once the *Nesidiocoris* have eaten all the Tuta eggs, they will be strong and hungry, so if the farmers do not feed them, they will start eating the plant sprouts and can quickly become a secondary plague, as described above by Juan. The social acceptance of pesticides often leads farmers to use them to control the Nesi population, yet as the previously quoted exchange shows, farmers are aware of the danger of this approach, which can easily kill the Nesi population instead of reducing it. This of course produces residues that will make the future introduction of Nesi populations difficult.

While the industry scientists present a fixed biological control solution to the Tuta pest problem, farmers need to negotiate nonlinear interactions among multiple

predictable and unpredictable variables, disentangling the diverse disequilibrium to ensure a standardised product that serves the economies of scale of the agricultural industry. The precarious balance of the *Nesidiocoris* population during its lifetime would be controlled naturally by other insects if green corridors were present, but their absence in Almería's industry makes the farmer the lead controller and regulator, a very difficult task considering the adult insect measures only 4 millimetres. Scientists claim the lack of sanitary measures and the dissociation of farmers from the nursery stage, together with the persistent use of pesticides, are critical factors that must be resolved in order to perfect the conscious adoption of biological control. These factors do represent obstacles, but a lack of regulatory measures, protocols and training, the difficulty of managing *Nesidiocoris* and the possible economic risks it can pose to farmers in terms of yield loss, also obstruct the adoption of biological control.

WhatsApp groups like the one featured above make navigable the social and technical uncertainty that farmers face (Pritchard & Sanderson, 2002). Through self-organisation, farmers engage in discussions at the margins of the industry about the reasons behind trend discontinuities like the aversion to biological control in tomato crops, unexpected occurrences like the appearance of external pests, and the emergent and recurring developments that affect their practices (Brooks, 1986).

These informal knowledge exchanges also help farmers emphasise two aspects of their relationship with biological control: the frustration of feeling alone in the productive environment, and the realisation that the environment is connected and that therefore residues, like plagues, will spread and expand from one greenhouse to the next. Frustration is particularly characteristic among farmers who do not have the financial means to assume production risks, and those who lose hope in the collective capacity for change and isolate themselves from the amalgamation of producers, agronomists and nursery houses. Such frustration stems from their experiences of the obstacles to producing under biological controls. This includes the technical uncertainty described above, but also financial uncertainty in the form of price

fluctuation and increasing pre-harvest investment, as well as increased regulatory pressure, increased regional competition and unexpected weather events (Darnhofer et al. 2010).

Some studies suggest this mobilisation and defence of practice-based knowledge serves to resist scientific certitude and assertiveness (Wood et al. 2014; Dargan and Harris, 2010; Fonte, 2008; Clark and Murdoch, 1997; Wynne, 1998). As farmers recognise their co-dependence, using these informal knowledge networks serves to stimulate the collective development required for adaptation based on social learning (Kroma, 2006; Oreszczyn et al. 2010; Schneider et al. 2009). As the study of Šūmane et al. suggests, locally generated informal knowledge “tends to be holistic as it considers the complexity of the realities in which farms operate and integrates the many or at least several of the environmental, economic, social, financial, technical and other dimensions into a single whole” (2018:238).

The literature suggests natural resource management is best addressed with socially generated knowledge, rather than rational scientific or industry-led impositions (Šūmane et al. 2018; Paudyal et al. 2016; Bodin and Prell, 2011). Farmers possess important problem-solving abilities since they manage complex ecological equilibriums on a daily basis. Integrating these types of knowledge is essential to breaking the existing inclusion barriers to production methods such as biological control (Van den Berg & Jiggins, 2007; Whitty & Maylor, 2009). The development of multi-actor knowledge networks combining formally and informally generated knowledge can be mutually beneficial. Based on reflection, re-learning and active adaptation, farmers maintain autonomy and agency over their decision-making processes, while scientists can learn about non-normative, nonlinear ways of organising the larger agricultural model (Šūmane et al. 2018). In the case of biological control, as the scientist Patria Rivas from Agrobio's insect breeding house states below, this involves negotiating responsibilities at the different levels of multi-actor engagement.

Patricia: Farmers ask us about their insects, saying they don't work, but nobody asks questions in the middle, nobody asks the nursery house. I believe there is no coordination between the nursery, the field agronomist and the farmer. We [scientists] must start being exigent. As we are made responsible, we must also ask responsibility of the rest of the entities that participate in the process of releasing insects.

Biological control by conservation, a way forwards

Taken as a top-down technology, which can be substituted for any other commercial product, biological control has in some cases reproduced the system that it set out to oppose (Guthman, 2014:3; Soule and Piper 1992). Aiming to provide a tool for the domestication of the auxiliary fauna for use by farmers, agronomists and the so-called 'bug houses' that breed and sell insects have created a sub-industry in the agricultural sector. The lack of biodiversity islands or wilderness spaces, where the auxiliary fauna could survive from one harvest to the next, leads to the same type of dependency among farmers as pesticides did, with farmers having to buy new bags of commercial insects every harvest. Insects become a product to be bought and sold, and whose effectiveness needs to be demonstrated rapidly in the greenhouse. In this process, bug companies domesticate the 'good' insects, breeding them in labs "while their multi-species landscapes are destroyed" (Tsing, 2012:144). As 'nature' becomes a technology, rather than a biodiverse ecology, attention to how interspecies relations are modified through domestication can help us appreciate the weaknesses of the technological model at large.

The eradication of wild flora and fauna took place in western Almería as European regulations on food security led to hygiene measures that prohibited keeping animals among crops and enforced herbicide use to kill wild herbs. These measures were passed on to future generations, as modernisation, capital accumulation and economic relations became the local mantras of agricultural industrialisation (Barbara Bender

1993:246). The introduction of auxiliary fauna for plague regulation was the first step towards reconnecting the sterile mono-crop plastic greenhouses with living organisms and non-chemically active modes of production. But it has proven inherently difficult for farmers to adapt to the regional tech-fix agricultural development logic, which has approached the natural environment and the local workforce as a machine with unlimited regenerative capacity, and produced a chronic dependence on external workers, technologies and inputs (Merchant 1980; Herrero et al. 2011).

As Raymond Williams' asserts, nature has become "the idea of man in society". In Almería's agricultural industry, the act of re-learning how to include nature in the industrial equation is hampered to imbalances, vulnerability and uncertainty (1980:71). The switch from pesticides to biological control in tomato crops has produced a constant dilemma for both farmers and scientists. That said, it has led to insightful community-level idea exchanges and negotiations, such as those surrounding the different visions of managing the natural and industrial environment, and those deliberating the choice between artificial and organic solutions for pest control. The dilemma is important, and can be further explored via the confrontation between "the cultural and the biological", defined by Roy Rappaport as the fundamental problem of an "ecologically-aware anthropology", which if implemented could help shape new understandings of the regional 'nature' management (1990:56).

So as to bridge the gap between engineered and ecological resilience as it is negotiated among bug houses, research institutes, administrations and farmers, it behoves anthropologists to unpack the agriculture industry's social, economic and cultural constraints, such as the conflicting structures of value and risk affecting farmers in the process of adopting biological control. This ethnography reveals that it is not scientific knowledge that is viewed as the problem, but rather the locally felt unfeasibility of the practices and industry configuration it is currently putting forward. The obstacles here discussed compromise farmers' ability to absorb risk, their economic independence and their immediate profits, as well as general

environmental preservation, community cooperation and the future productivity of their land. Biological control is therefore a technology that can reunite the farmer with nature-based solutions, bringing natural life back to the soil, but it requires a conscious reconfiguration that takes into account long term sustainability in addition to short term returns. The proliferation of plagues and viruses due to the low release of *Nesidiocoris* accentuates the impulsive responses associated with the need to generate short term returns, leading farmers to use pesticides instead of releasing more natural enemies. Sustainability is therefore compromised, as the long term effect is invariably the appearance of more plagues and viruses, due to the resistances they develop and the collateral damage done to auxiliary fauna.

Regional scientists see biological control as a “mode of revealing” infrastructural sustainability in intensive greenhouse production (Heidegger, 2009:104). However, its adoption as a technology often compromises its capacity for social and environmental sustenance, and is contingent “upon the social relationships and identities which people feel to be affected by scientific knowledge, which never comes free of social interests or implications” (Wynne, 1992:281). The price pressure of the European vegetable market leaves no margin for error, so for any contemplated change in production behaviour, consolidated social and commercial acceptance is required for general adoption to take place. As such, the ethos of adopting biological control does not depend on prediction and control systems outlined by scientists in local research centres, but on the farmers’ social networks. Farmers negotiate changes in the production behaviour on a daily basis with friends, neighbours and trusted agronomists, making decisions and taking responsibility collectively based on local practices and experiences. Changing a variable in the production process can alter the entire balance of the greenhouse, leading to major losses that might compromise the whole financial structure of family farms, which often already depend on tight bank loans. Consequently, the advantages that biological control can offer to the wider environment are contingent upon the precarious fortunes of the individual producers implementing it.

Conservation scientists and their support for local knowledge

The literature refers to three types of biological control: 1) Classical biological control, which imports natural enemies from the pest's area of origin, introducing them as colonising agents in the productive environment (Huffaker, 2012; Greathead and Greathead, 1992); 2) Augmentative biological control, which involves the breeding and selection of insects to be released when pests arise (Parrella et al. 1992; Knipling, 1992; Hunter, 1994); 3) Biological control by conservation, which refers to actions that modify both production and the landscape to preserve varied insect ecosystems that help natural enemies manage pests and subsist over time (DeBack, 1964; Hoy, 1988; Nordlund, 1996; Ehler, 1998). While bug breeding companies and scientists funded by those companies favour augmentative biological control, this model depends on regular farmer intervention to keep pests below damaging levels. Alternatively, biological control by conservation is beneficial as it reduces human intervention and technification of nature's management, allowing for the inclusion of autochthonous natural enemies adapted to the local conditions.

However, the conservation approach has three underlying problems: 1) The need for scientists to justify this method, which centres research on plant-pest-natural enemy variations to the detriment of research on hedgerow management, greenhouse hygiene, contamination sources, virus and diseases, insect livelihoods and insect ecosystems (Norris, 2011); 2) A lack of funding, the pressing commercial interest of bug breeding houses and the solution-oriented thinking of scientists have marginalised the research conducted in this field, reducing it to an "academic interest" (Ehler, 1998:6); 3) This in turn marginalises farmers and specialists in direct contact with the production environment, further impairing the adoption of biological control since it comes packaged as a market imposition rather than a collective, locally informed decision.

Scientists like Monica González, Cajamar's lead researcher on biological control, have been pushing to develop collaborative methods to help farmers producing under

biological control to overcome the sustainability-profit dilemma. The scientific certitude she shows in the testimony quoted earlier in this chapter is not representative of an entrenched opposition. She thinks about the overlaps in scientific, ecological and family farming knowledge, and is working towards the legitimisation of certain modes of local knowledge through the conservation approach. Even in her epistemically privileged position as scientist, she has faced logistical and financial challenges while carrying out her research in the context of the dominant scientific orientation favouring classical modes of biological control. However, it was not until 2005 that the EU published the directive for chemical pesticide regulation (91/414/EU), delaying the funding for projects like the one Monica was working on up until 2009. In an interview, Monica spoke of some results achieved in spite of the receding support.

Monica: Through the Biodiversity Island project in 2009, we generated consciousness in such a way that the town hall of El Ejido was included that year in the municipal regulation of rural health and the establishment of hedgerows with auxiliary flora.

For Monica and Estefanía Rodríguez, her research partner, the idea of developing green corridors was a distant one. Their project on biodiversity islands was a first step in the implementation of biological control by way of conservation. It proposed the creation of a forest island in Cajamar's Experimental Station, together with social measures to help nurture biodiversity and improve the efficiency of biological control.

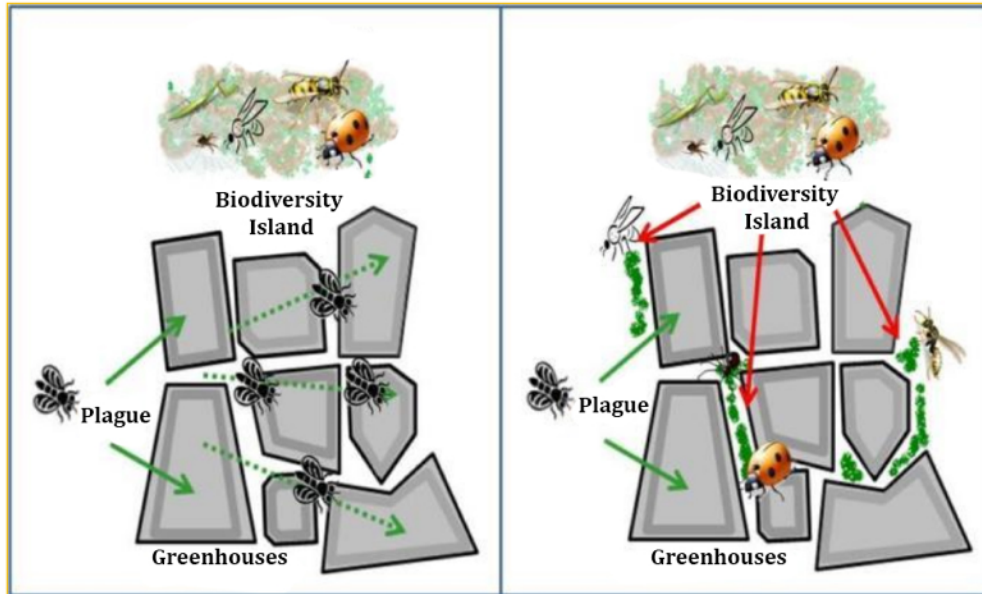


Diagram 2: Current and desired scenario models from the Biodiversity Island project. Adapted from Rodríguez & González (2014:4)

After many years negotiating with political groups, or ‘fighting’ as Monica puts it, the local ordinance on greenhouses and their environment, published in the official provincial bulletin (B.O.P.) of Almería on 3 August 2017, called for the mandatory growth of natural hedgerows for all greenhouses seeking new licenses. This was inevitably going to have limited effects, as it only applied to new licenses in El Ejido, which itself was the only town to adopt this measure. This left 30,456 occupied hectares in the region unaffected by these plans. Biodiversity islands seek to create rehabilitation spaces for insect, plant and animal species that coexist in the agricultural environment. However, with the reality that they are so limited in number and owe their existence to legal mandate rather than conscious change, many of these biodiversity islands lack water and a regular care, ending up as short-lived beautification projects that cover up the plastic walls of the greenhouses, only to dry out or become infested with plagues.

Contests of expertise emerge when the status quo of the industry is brought into question. These forms of knowledge are marginalised regardless of the position of

those that possess them. Yet, being in a position to affect policy change by making hedgerows mandatory, even without popular support or understanding, is a big step towards changing how future agriculture is done, as well as the way in which scientists approach ecosystems and their interactions with them. Today, the isolated spaces scattered through the landscape ultimately defy the idea of making a recovery place for the insect population that is beneficial to the agricultural environment. Yet, their existence can help farmers and scientists alike to negotiate and adapt to this new element and find ways in which it can fit into their agricultural ecosystem. Despite current administrative efforts to increase funding for biodiversity islands, and to make information available through a mobile app for biological control, the planned transformation still stops short of its potential because it remains top-down, marginalising the experiential knowledge of farmers. The legitimisation of certain modes of knowledge over others needs to be examined and re-negotiated within the broader context of power for change to be possible. The next subsection will explore how some farmers have succeeded in implementing biological control by conservation, and how they position their knowledge-making in relation to the industry.

Farmers rewriting sustainability through the conservation approach

Lola Gómez Ferrán, a farmer and pioneer of biological control who not only manages a greenhouse, but also hosts educational visits for children and adults, is a major advocate of conscious biological control. When biological control emerged, the IFAPA research centre's technical classes for agronomists were held in her greenhouse. She also published the first children's book on biological control in 2006, which was used the following year, after the sanitary scandal, to promote Almerían Agriculture at Berlin's Fruit Logistic, the biggest vegetable fair in Europe. However, years later, the organisations, research centres and companies from Almería that bear the standard of biological control in the international fruit fairs, don't even count her in as part of their team.

Mirroring the transformation in professional engagement outlined by Meijboom and Stafleu (2016), Lola, by actively defending her moral beliefs in the farming industry, has had to distance herself from physical farming due to the time she had to spend at seminars, fairs and outreach events. It has also prevented her from joining the formal industry representation, since her arguments cannot be reconciled with the finely tuned communication strategy of the commercial marketing departments. Her seventeen years of work, like that of many other farmers setting an example, have not been taken into account in relation to the 3.5 million euros designated just for the current Hortiespaña campaign, which promotes the southern greenhouse agriculture operating under biological control. Denying farmers' professional and moral autonomy in the commercial and regulatory representation of an increasingly technical and standardised industry raises ethical issues, as it invisibilises farmers' decision-making power, their capacity to take responsibility and ultimately their social and professional agency (Robaey et al. 2018; Meijboom and Stafleu, 2016; Hendrickson and James, 2005; Abbarno, 1993; Buckhart, 1988).

Lola: When you start going to fruit fairs, where the establishment is invited by different companies, you start to get to know people. They are the ones putting their fists on the table before the politicians, they are they lobby representatives.

The small farmer with one or two hectares will go to buy insects for one hectare and ask "How many insects are you going to give me as a gift?" The farmer with 7 hectares will come and ask, "How many insects do I need in order not to take any risk?" The second farmer, each insect he adds he balances out the accounts, because he functions like a company and knows that further investment will bring crop security. Small farmers continue without making accounts. This makes a priority shift very difficult. The problem for the crops that are full of viruses was the previous crop, which because of skimping they ended up using chemicals on. That's when you have insects with resistances; it's a case of the snake that bites its tail.

The European Union has been banning many active substances over the last fifteen years, because in theory they are bad for the environment, the people, the fauna, the flora... I say this in brackets because when you see the list of the permitted and forbidden substances, you end up with your head in your hands... The EU Common Agricultural Policy CAP delimits what we do. The problem is the CAP is oriented towards big agricultural exploitations. The focus of the Common Market Organization (CMO) of Fruit and Vegetables is not on grants and research, but on the market. To prohibit is a steamroller. To demand that governments create legal frameworks to promote more sustainable products is inoperative. As a result there hasn't been operability in our administrations for many decades.

Lola made it clear the problem was not only a lack of education about good agricultural practices, but also the culture of lobbying and passive engagement at the European and local governance levels, and the non-corporate culture of farmers that keeps them from taking strategic crop security measures. Ecofeminist thinker Vandana Shiva argues that the exclusion of local agents of knowledge in the western patriarchal scientific and regulatory paradigm, along with their ways of knowing, reduces our collective knowledge of nature in so far as it leads to a utilitarian use of nature, which exhausts natural resources and reduces their capacity for renewal (Shiva & Mies, 2014:23). Despite Lola's criticism of the system and the existing production culture, she still strongly believes that a change can come from within the industry. That's why she keeps going to vegetable fairs and seminars, to get close to the people in charge, introducing little by little some cues to move towards sustainability, which she hopes will produce material changes in the industry.

Outside of the institutional circle of seminars, research centres, administrations and vegetable fairs, during my time in the field I also engaged with a group of five greenhouse farmers, who were actively trying to dissociate themselves from the industry. Having switched to alternative modes of production like permaculture or biodynamic agriculture, their aim is to resist the imposition of the industrial model on

the natural cycles of plant growth. In most cases, this decision had come after a period of prolonged economic vulnerability for the farmers while operating under the industrial model, leading them to find more sustainable modes of production and commercialisation. They had set up a consumption group, where sales were carried out directly from the farmer to the consumer through monetary exchange or barter. Despite their marginal position in relation to the industry and the criticism their activities have received, their work is very relevant because it shows the possibility for sustainable change in the industry, albeit on a micro scale. Antonia and Matías, the farming couple featured in the film, and who belong to this group, referred to themselves as peasants. They loved the words 'agricultor' (farmer) and 'the culture of agro', but they claimed people in the region had destroyed them, and now they prefer the term 'campesino' (peasant) with its direct connection to 'campo' (land).

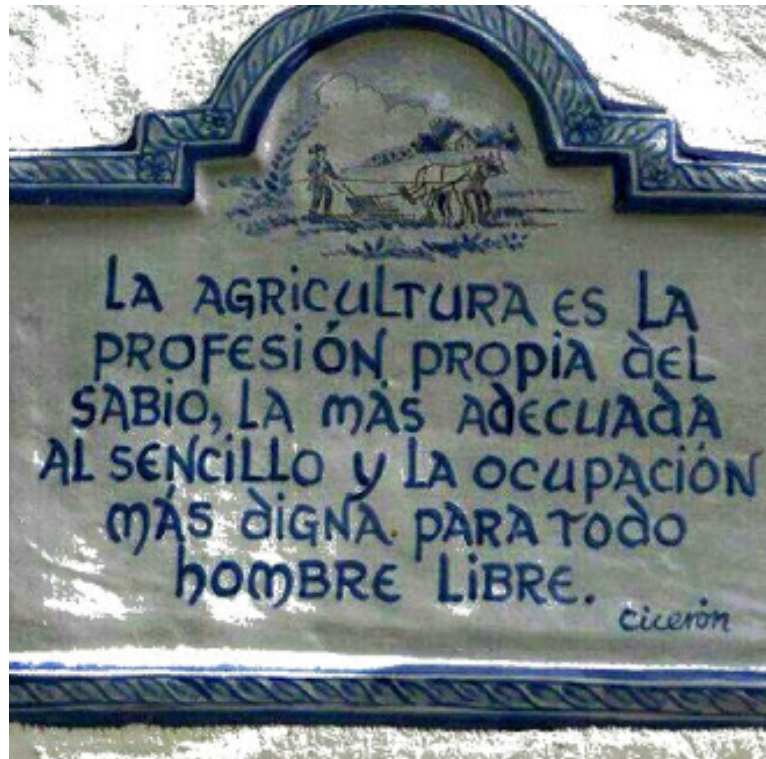


Photo 11: Agriculture is the profession of the wise man, the most simple and dignified occupation for every free man [literal translation]. "For of all gainful professions, nothing is better, nothing more pleasing, nothing more delightful, nothing better becomes a well-bred man than agriculture" [Original quote attributed to Marcus Tullius Cicero (1873:73)]. Photo by: Fitosofia, 2015.



Photo 12: Interview with Antonia and Matías. Photo by: Benjamin Llorens Rocamora, 2017

Matías: The results are here, on a global level, concerning the soil health and human health. Our aim is to recover all the good practices that we've left behind. The purpose is not to disinfect. That kills the soil. You have to preserve the balance. The peasant needs to have the knowledge and resources to observe the soil and see when the nematodes are affecting the roots, because if the equilibrium is broken, you need to produce natural bio-fertilisers to give to the soil good bacteria. With the Mycorrhizae and Trichoderma that contribute to soil equilibrium, you do everything with your hands, without the need of any corporation. The association of plants maintains soil humidity and the dewdrops water the soil. If you dig into our soil it is humid, and when you have living soil it becomes an important CO² trap. But if you work the soil, till it, pervert it, or kill it, the effect is the contrary. This affects the plants enormously, and also pest control.

For Lola, the technology of change takes place through a sustainable management of

the industrial family farming agricultural model. For Antonia and Matías, the technology of change implies ending the farmers' economic dependency on external inputs as well as the vulnerability imposed by the industrial structure. Lola wants to continue exporting her tomatoes to the European market, whereas Antonia and Matías fight for a model where production and consumption take place within the local community, without the need for commercial inputs. They take it as an opportunity to learn from the people around them and to teach others what they know of the land. Both for them and for Lola, technology is the way of knowing inherited from their parents, which they continue to share with all those willing to listen. However, for Antonia and Matías, such a way of knowing implies drastic transformations, which would be impossible if the agricultural system continues to be controlled by import corporations and supermarket chains. Antonia and Matías have taken the notion of ecological resilience a step further through what they have termed 'emotional agriculture', a production practice that acknowledges the experiences and feelings of humans, plants and animals, promoting a holistic balance between the multiple interacting ecosystems.

Scientific studies supporting classical and augmentative models of biological control have had a hard time accounting for complex ecological interactions because they have assessed "community re-assembly" based on how one (often exotic) insect species can act as the predator of an invasive species (Hoddle, 2004). This has undermined the collective research and understanding of ecological interactions, such as that of foreign pests and natural enemies with autochthonous species at the physiological and behavioural level, which may cause disruptions in the trophic chain and in food-webs (Callaway, R. M., & Howard, 2007; Louda & Stiling, 2004; Miller, T. E. 1994; Paine, 1992; Strauss, 1991). The agricultural industry has made use of scientific and technological advances to enforce increased control over nature, leading to an invisibilisation of and distancing from the emotional side of interspecies relationships (Hernando, 2012). The literature suggests that acknowledging our species interdependence goes hand in hand with taking responsibility for our collective wellbeing, tearing down disparities based on sex, race, class, and anthropocentrism

(Nussbaum, 2001). As the example of Antonia and Matías suggests, this involves a systemic change in the way we conceive of labour, which should become an enabling activity that satisfies our needs in collaboration with other humans and species, so that our individual livelihoods attain egalitarianism and sustainability (Mora, 2013; Herrero 2013; Carrasco, 2009; Bosch et al. 2005).

Conclusion

“Production boundaries” imply that all knowledge outside of scientific and technological frameworks of analysis is unaccounted for (Shiva & Mies, 2014:165). This includes the knowledge generated by other species, women, migrants and ecologically minded family farmers, which although central for biodiversity conservation are considered as external or irrelevant to production. As Karen Warren suggests, ecological ethics require an attitude change that transforms industry leaders’ arrogant and dominant worldview of other humans and non-humans, into an “affective” or emotional worldview (Warren, 1998:134). A sustainable livelihood for farmers, women, migrants and insects in Almería, as opposed to a subsistence livelihood, requires respect and support for the autonomy of these vulnerable social agents, as a first step in the effort to “repair the dynamic equilibrium of ecosystems” (Zuluaga & Cárdenas, 2014:160).

The de-privatisation and collective appraisal of common goods can only take place by revaluing and including vulnerable knowledge agents in the decision-making process (Zuluaga, 2020; Shiva, 2005; Mellor, 2018). This comes about by way of overcoming the “conceptual framework of work vs. the environment” (Sessions, 1997:177) and requires a reversal of the great transformation of agri-business, in other words, a return to agri-culture (Berry, 2015). We need to re-think and become sensitive to the diverse interacting rhythms in our ecosystems if we are to work alongside nature to satisfy our production needs.

While permaculture is not for everyone, it has become clear that industrial agriculture as it is conceived today is not the future. Producers and consumers need to become conscious of the types of politics and cultural norms that are affecting agriculture, the way we eat and the way the climate behaves. In order to engage in meaningful forms of sustainability, agriculture as a technology needs to be sensitive to how its agents acquire and shape their knowledge. Negotiating a collective transition to sustainability requires a cultivation of the “epistemic virtues” of local agents, accepting the necessary “forward-looking responsibilities” with regard to their values, burdens and ethics while developing a range of small-scale conservation projects (Robaey et al. 2018:5).

Anthropologists have shown that people are capable of working to make a good living while reserving the majority of their time for socialisation, leisure, play and personal wellbeing (Sahlins, 2017). In addition, environmental and agricultural scientists have shown that “less time in informal networks weakens trust, reduces the opportunities to have positive experiences from co-operation and collective action, fewer experiences on how to create win-win solutions with others” (Darnhofer & Strauss, 2015 as quoted in Šūmane et al. 2018). The evidence tells us that we need to re-conceptualise time and re-learn patience to truly understand embodied and ecological rhythms. As Antonia and Matías showed me over the months I spent with them, for permaculture to work, you need to be able to lay back and observe how the ecological system behaves if you stop intervening, only then can you find a justification for action.

Those who engage directly with the land are continuously making value judgements based on weather, labour, plant needs, family needs and the conservation and sustainability of livelihoods (Shiva & Mies, 2014). Taking responsibility for such judgements involves constant attention to how our decisions affect others and how they modify ecological ways of being. Research shows that this is best done by individually and collectively re-learning through engaged multi-actor knowledge, and by reversing productivist logic (Fernández et al. 2017; Moschitz et al. 2015; Knickel et

al. 2009; Ingram, 2008; Berkes, 2007). Accessing these pathways of inquiry is essential for farmers and scientists if they are to engage holistically with the environmental, social and economic dimensions of sustainability (Curry & Kirwan, 2014; Pretty, 2008; Morgan & Murdoch, 2000; Hassanein, 1999; Ikerd, 1993; Kloppenburg, 1991; Jackson, 1980). The entry point, as this paper suggests, is the focus on local knowledge and practices as they approach or distance themselves from sustainability (Teixeira et al. 2018; Lamarque et al. 2014; Eckert & Bell, 2006; Hansen et al. 2006).

With scientific advances in plant biotechnology continuing to shape biological control, along with advances in the reproductive and augmentative technologies developed for insect populations, it is all the more crucial to address the question of what nature has come to mean to our diverse agro-cultures (Šūmane et al. 2018:32). As part of that process, it is important to redefine what is deemed as void or valueless in our natural environment, to support individuals by breaking down inclusion barriers to technology, and to critically examine the reductionist capitalist vision of the agricultural industry.

Conclusion

The dialectic between society and the natural environment, derived from a co-evolutionary process that has sustained traditional regional agricultural forms of subsistence, has been utterly changed by intensive agriculture (Foster, 2000:141). Man took the dominant position over nature to the extent that now an anthropogenic landscape defies the land's physical resource limits and puts an end to the multilateral communicative endeavour between man and nature, that which sustains the continuity of life. The 30,000 hectares of plastic greenhouses that composes western Almería's 'Plastic Sea' reveal the eco-social transformative capacity of an agricultural production network that thrives on challenging Earth's regenerative capacity, as well as the coping capacity of its labour force.

However, it doesn't matter how efficient you make drip irrigation if there is no more water, and it doesn't matter if you learn to kill a plague if you produce mutations that cripple farms. Local sustainability strategies will not fix or even patch up the current industrial structure since its underlying extractivist and revenue-based logic prevents the drastic changes required. However, such strategies do point to methods of downscaling and of restoring value to the central contribution of women and nature to sustainable living.

This thesis has focused on the marginalised actors in the local labour structure across different echelons of the intensive agro-industry in western Almería, southern Spain. Throughout this work, it has been demonstrated that studying the dynamic aspects of labour as eco-social emotional processes reveals workers' negotiations and rejections of the agricultural industry and its topographies, effected by way of their creative and physical effort. In this sense, the agency employed in social interactions and resistances is not just a property affecting the labour structure, rather it transforms the workers' creative relation to their environment, influencing established power

geometries and the web of interactions between humans and non-humans in the industry. This interest in conscious effort, agency and everyday resistance entails a reframing of labour knowledge from the perspective of workers.

The paradox of over-exploitative industrial mono-crop agriculture is that it leads its producers to exploit humans and non-humans faster than nature is able to compensate for through regeneration. In this situation we as humans, and as part of nature, are also affected through the trickle-down of over-exploitation. Technical scientific studies of the adaptation to sustainable forms of production, along with a section of the literature dealing with the regional crisis of family farming, assign to agronomists the role of mediators between farmers and the productive environment. This process physically and emotionally removes farmers from their historical capacity to manage stable crops and to create a socially and financially sustainable livelihood.

In accordance with Gupta's critique of James Scott's definition of "everyday resistances" in his seminal work 'Weapons of the Weak' (Scott, 1985), exaggerating isolated acts of theft and ethnic confrontations as resistances can be seen to reinforce the logic of domination employed by the oppressing farmers and companies. This in turn justifies the "routine repression of poor peasants and agricultural labourers" (Gupta, 2001:90). Hence the interest in everyday workers' interactions and collective resistances as the moments in which the cultural and material domination, exploitation and economic relations imposed by the agricultural industry's elites are mitigated by the workers (Edelman & Haugerud, 2004:38; Vinthagen & Johansson, 2013:4).

This insight builds on the literature that seeks to broaden agricultural labour analysis beyond value systems, market strategies, budget restructuring and shifting needs in supply and demand (such as Podolinsky, 1883; Rappaport, 1968; Berry, 1981; Velten et al. 2015; Murphy, 2012; Eizenberg & Jabareen, 2017). An approach so informed pays special attention to the life-sustaining strategies that maintain the continuity of

family farms and the natural environment. Such strategies entail a conception of labour as a relationship based on the energy exchange between human and earth, wherein the labourer can control how his or her own energy is deployed in exchange for the future energy derived from the consumption of the product he or she chooses to produce. In this sense, labour is the “use of the mechanical and intellectual energy accumulated in the organism, which has as a consequence an increase of the general energy budget of the earth’s surface” (Podolinsky, 1883:172).

Labour is not exclusively exercised by mechanical bodily actions, but also stored and directed by the minds of workers who decide how the interaction between their bodies and the productive environment will take place. Agriculture, in its most traditional form, was based on the exchange of a unit of human energy working the land, combined with x units of solar energy, for the reaping of future energy received from consuming the harvest. This transfer of energy, defined as the “only universal currency”, is fundamental to any action or change happening in our society, including those present in intensive modes of production (Smil, 2017:1). Thus, for social scientists there is a need to refocus on the worker’s role in regulating the energy balance through the production process, observing how workers’ agency is affected by the industry’s structural tensions and disparities of liability, which have a direct impact on family farms and low-skilled labourers, including women and migrants (Smil, 2010).

Recent approaches to the anthropology of labour have followed a rejection of structural-functionalist arguments defending a “unified capitalist system-logic” (Ong, 2012:26, 30). These studies reveal the social messiness that accompanies the economic diversity of supply chains (Tsing, 2012). They account for the “seeming immutability” of life at work (Taussig, 1993:xvi), despite the fragility, instability and contingent networks of capitalism (Bear et al. 2015; Narotzky & Besnier, 2014; Wolf, 2001; Li, 2007; Campbell, 2018). These approaches entail an understanding of labour that does not reject the analysis of social structure’s effect on workers’ agency and everyday social interactions.

We need to take into account objective realities alongside the diversity of analytical models, such as those proposed by Marx (1976) and Strathern (1988), while accounting for complex “real life articulations” (Harvey & Krohn-Hansen, 2018:19). With that purpose in mind, this research centres on workers agency, employing an analysis of the cultural heterogeneities embedded in the relationships between human practice and the “global entity which we call 'the system'” (Ortner, 1984:466). As Talal Asad (2009:7-15) argues, cultural autonomy should not be assumed, rather the aim is to understand how the political contingencies affecting the distribution of goods systematically sustain or stifle local people’s ability to build their own history, change their aggregate human condition and develop meaningful situated forms of sustainability. In other words, using agency as a means of understanding social sustainability is an attempt to resolve existing tensions between the “instrumental action of economic production” present in physical mechanical industrial labour, and the “communicative action of human relation” deployed in affective, abstract, post-industrial, immaterial, labour (Hardt & Negri, 2000:293).

Following the feminist scholarly analysis outlined in the Gens manifesto, such ideological categorisations generate inequalities by erroneously attributing certain qualities, including creative and communicative powers, to non-industrial labour, reinforcing a hierarchy of value within labour regimes (Yanagisako, 2012; Bear et al. 2015). Moreover, the Gens manifesto claims that the heterogeneity of time-space in contemporary capitalism stands as evidence that the space-time contradictions of the financial market are mediated by labourers within the workplace, including those taking place at “intersecting sites of production, such as the household, corporations, or education”, and “dependent upon those multiple and non-linear cultural, material, political, and legal transformations” therein (Bear et al. 2015). To assume Antonio Negri’s conception of the “subsumption” of labour and direct social control by the biopolitical regulation of finance capital would neglect the perceptual and practical understandings of industrial labour explored in this research (2017:38). Instead, the aim of this work has been to drop deterministic relationships in favour of analysing

heterogeneous workers' negotiations, including their financial rationales as indebted-selves, and the everyday forms of survival by which they mediate their social relations, affective networks, resistances and "relational autonomy" (McNally, 2017:105; Pellandini-Simányi et al. 2015).

This research has accounted for the ways that western Almerían workers build alliances within their communities, reshape the structure of their family farming model, reconfigure the family space and negotiate their bodily energy expenditure to cope with the forms of labour oppression and ethnic confrontation embedded in the intensive mode of production, things that previous regional studies did not address. The thesis has also attempted to demonstrate how labour knowledge in western Almería is mediated by human and non-human interactions in and outside the industry. It has asked who deploys their "individual self-contained creative energy" to subtly control agricultural modes of production and decide how industrial labour reshapes their personal rights and livelihoods (Narotzky, 2018:31).

Local knowledge and workers' collectives inherently reshape the power relations between labour and capital by "permanently disrupting and reorganizing the spatial-temporal dimensions of everyday life" (Ibid:41). The paradigm of "dislocation", or the continued resistance to a static form of labour, allows for a consideration of the power that workers' creativity has to transform the industry through everyday struggles and subtle forms of sabotage, rather than those workers simply being signifiers of objectified capitalist social relationships.

These assertions are based on the geographically broad and historically deep "experience-near" approach outlined by Paul Farmer's applied anthropology framework, wherein the combination of factual and symbolic local forms of knowledge is central to the construction of a social theory (2010:31, 59). This approach has been used to show how experience emerges from specific historical circumstances and through contemporary global relations, which also offer a

framework for comparing and contrasting, including the shared and different aspects of experience.

It is in this way that the situation of precarity and oppression experienced by workers in western Almería can be seen as unique, in relation to the many currently existing across the world, or which have existed throughout history. To theorise your own exploitation and be willing to share it with a researcher in the hope that it will be heard, is in itself an act of transformation in today's world. This is the type of political positioning I have come to endorse and support over the course of this research. The focus on local forms of representing and analysing labour dynamics has complemented a participatory ethnographic approach to fieldwork. This involved a year of apprenticeship in local greenhouses, in addition to numerous visits to the regional warehouses, auction houses, cooperatives, packaging and distribution centres and scientific labs and institutes, all of which facilitated the gathering of knowledge about the interactions across the different echelons of the chain.

The participatory methodology was comprised not only of my experiential knowledge, but also the consistent use of audiovisual recording, with two intentions: 1) to produce a research-based participatory ethnographic documentary in order to represent local labour with particular attention given to eco-feminist life-sustaining strategies, and 2) making audiovisual tools available to the local informants for their personal representational purposes, thereby building trust with them and helping them create alternative narratives from within. This second point involved filming and editing protests and company denunciation videos for the Andalusian Workers' Union, conference recordings for Cajamar's scientific research centre, event videos of El Ejido's gender violence and pension rights marches, recordings of Ecologists in Action meetings, and music videos for young local music groups, as described in chapter 5.

The small-scale family farms I studied have heterogeneous backgrounds, something they share with the current temporary foreign labourers who work on the farms and in packaging centres on a seasonal basis. Approaching the fluidity of histories and

social interactions that compose this complex industrial context has highlighted its heterogeneous manifestations and forms of dislocated alignment. The research lays the basis for an account of western Almerían workers' social and environmental spatial negotiations, which starts with the family farm model that constituted agriculture in the '50s, and goes on to deal with how it has been reshaped and reformulated by workers parallel to industrial modernisation and intensification.

I remember my grandfather (who was born in the region) complaining about the growth of the greenhouse structures when I was little, always saying: 'we are going to end up without land or water'. Twenty years later, he like many others no longer complains. The agro-city keeps growing, but now the infrastructure is efficient, the greenhouses are insulated, industrial complexes work as an articulate organism and circulation is smooth. Harvey et al. suggest it is at this point, when infrastructure works so well that it can seem invisible, that the 'analysts should bring to light the hidden relations on which smooth circulation depends' (2016:3).

The unseen underbelly of infrastructure and the density of institutions have conditioned and reshaped people's subjectivities over time. Geoffrey C. Bowker (1995) suggests infrastructures are projections turned into surfaces upon which social, cultural, or political interchanges can be unpacked. He claims that through 'infrastructural inversion' as an analytical approach, the emphasis shifts from infrastructural components to infrastructural relations, a shift that allows us to contest the passive acceptance of infrastructure and the way that it fades from discourse as it is used (Bowker et al. 2009:99; Harvey et al. 2016:8). The sea of plastic greenhouses in western Almería, which stands out as the only white area when looking at Spain from space, is something we cannot allow to disappear from the analysis. The relationships between those greenhouses and the people that make a living in them matters, not only for their own livelihoods and for the healthy production of vegetables, but also for our planetary health. The scope of human intervention, easily seen in satellite images, is a clear example of the wrongdoings of boundless capitalism unrepentant for its impact on the planet.

Western Almería's situation is a clear reflection of market interests and local and international politics. In one sense, it reflects the corrupt local administration as shown by the distribution of infrastructure contracts among its leaders' subcontracting companies (i.e. Elsur) (Tena, 2010). In another sense, it evinces strong market aspirations and competitive ambition, made apparent by the newly built highway and parking lot to facilitate transport and mobility in El Ejido's industrial complex and faster distribution to the rest of Europe. Finally, to see western Almería is also to see the somewhat warped materialisation of Europe's sustainable development strategy, exemplified by the 12 million euro grant awarded – as part of the Sustainable and Integrated Urban Development Strategy (EDUSI) and funded by the European Regional Development Fund (ERDF) – for the implementation of the 'Sustainable El Ejido 2020' program, which, as has been found during this research, has had limited effect.

Observing the greenhouses as the dominant infrastructure that have reshaped and reordered 30 km² of land surrounding the city of El Ejido, it's obvious that they have not only become urban materialities but also social and relational spaces, connected through narrow alleyways. It is also through the greenhouses that workers and inhabitants engage with the transformation of infrastructure, as the plastic covers are thrown down and built from scratch four times a year before every crop. This way, the inhabitants of El Ejido constantly interact with greenhouses at different moments of construction, and past modifications remain part of the present infrastructure and of people's interactions in and around the greenhouses (Star, 1999).

While the public display of infrastructure in the form of greenhouses is not 'unnoticed', as Larking suggests (2013), mundane operational processes remain hidden, such as the ventilation controlling the chemical composition of the air inside the greenhouse, or the administration of specific security and health requirements (Bowker 1995). The increasing role of 'critical infrastructure' in disaster planning (Lakoff & Collier, 2008), or Walt Rostov's 'take-off' model of development (1960), cast

infrastructure as a promise for the future. Likewise, the turn to sustainability in the fourth development phase of El Ejido generates hope based on the technical and research initiatives of the second generation of settlers, now the agro-city innovators and engineers.

Rather than ignoring the core environmental and labour conflicts of El Ejido, these workers continue to expand the industry by searching for new modes of production that benefit workers and plants alike. For them, as Hetherington explains, the development of infrastructure is precisely to make it invisible, 'to provide the stability necessary for the emergence of processes of a different order – alternately imagined as development, civilization, or simply progress' (2016:42). This thesis has aimed to give voice to their life stories and their means of representation. It has attempted to show how workers' relationships are internally conceived, where they find conflicts of representation, and what obstacles to a socially sustainable mode of production persist in relation to the different topics explored.

The argument constructed over the course of the thesis has explored: 1) the construction of meaning on family farms, and the role of the latter in defining local sustainability; 2) the progression from survival to a normalisation of inequalities through public secrets, and the existing modes of workers' agency and resistance encountered among migrant labourers and female packaging workers; 3) the conflicts of representation regarding social sustainability in the agricultural commodity chain, and the participatory experiment of co-representing an eco-feminist view of sustainability from the point of view of a local family farm; 4) the adoption of biological control in tomato crops and the communication gaps in the decision-making process between farmers, scientists and input providers.

Focusing on how families negotiate the dual roles of peasants and agro-business managers, and showing the fluidity between the two, has allowed the present work to explore: 1) the origin of family farming and its constitution of space through non-scalable values, 2) the main transformations of family farming through the process of

industrial modernisation and institutional regulation, 3) the ways in which non-scalable family farming values continue to sustain the industry, and 4) the suspensions of intergenerational transmission as the model distances itself from peasantry. It has been underlined that regional scholars have often neglected how family connections and knowledge are renegotiated over time, and have ended up reconstructing fixed models denoting an absolute existence or absence of sustainability, ignoring the families' capacity to adapt and subsist in changing circumstances.

Taking the point of view of the farmers, this thesis has presented some of the main themes that demonstrate the adaptability of the family unit, exploring how farmers from different generations deal with the scalable and non-scalable factors of the industry as they either approach or distance themselves from the commercial appropriation of the family farming model. The analysis is partly brought forward through experimentation and collaborative production in ethnographic film, the results of which represent local sustainability and the efforts taken to distinguish it from the agricultural commodity chain in Almería.

This research has shown that the industry's intensive mode of production comes with an inability to overcome existing natural imbalances, and that consciously collaborating with nature in a generative way is possible within and outside the industrial environment. Finally, feeling that the situation of imperilled productive ecologies like those found in western Almería calls for a motion from the diagnostic to the curative, the thesis calls on anthropologists to consider a renewed focus on those forms of engagement between humans, non-humans and nature that create truly sustainable modes of production.

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Introduction

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