

The context is more important than the commodity in understanding stakeholder responses to blue gum plantations

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Abstract

Forestry plantations constitute fertile ground for critical analysis of land use conflict. Policy-makers are increasingly recognising the need to address controversial issues in the plantation forestry sector. However, these efforts are often grounded in short-term analyses, resulting in static or inappropriate responses to a dynamic commodity environment. This research article proposes that combining cognitive and social research approaches can elucidate place-based land-use conflicts that at their root, are about more than just the one particular commodity under examination. We explore stakeholders' perceptions and attitudes around Tasmanian blue gum (*Eucalyptus globulus*) plantations in a region that has witnessed three radically different social-economic stages of blue gum plantation growth and management over the last 25 years. Our findings show that individual perceptions and attitudes over time are most closely related to the economic characteristics of blue gum plantations than to any other factor. By extension, market instability shapes popular narratives around blue gum plantations. We conclude that the analysis of conflicts associated with long-established forestry plantations should encompass an understanding of community members' worldviews and emotions in addition to economic analyses in order to adequately explain conflicts.

KEYWORDS

Forestry plantations; eucalyptus; land use conflict; community; perceptions; attitudes; market instability

Introduction

Tree plantations have expanded in many rural spaces worldwide over the past few decades (FAO 2015). Eucalypt species, chiefly Tasmanian blue gums (*Eucalyptus globulus*) are cultivated in temperate, sub-tropical and even tropical areas of all continents except Antarctica as a major source of wood pulp (Figure 1). Although the nature of industrial tree plantations differs within regions in terms of land tenure, plot size and means of processing, a number of international studies have reported conflicts

associated with low levels of community endorsement and low enthusiasm for blue gums by people living in areas near plantations (Hohenthal, Räsänen, and Minoia 2018; Silva and Tome 2016; Williams 2014). Negative attitudes towards this species have encouraged companies and governments to invest in trying to understand what drives public acceptance of blue gum plantations (Vanclay and Esteves 2011), as well as in research around more complex cognitive factors such as people’s desire for conservation (Bennett et al. 2017) or community engagement (Dare, Schirmer, and Vanclay 2014). To date these efforts to improve public opinion of blue gums have generally been ineffective, partly due to changing dynamics in terms of actors involved and the spatial scales at which blue gum plantations operate, over time (Karimi and Hockings 2018). For such a strategic commodity as wood pulp, surprisingly little attention has been paid to power relations that relate social interactions with land use change (Hersperger et al. 2015).

Country or sub-national region (Sub-national regions marked with *)	Area planted to <i>Eucalyptus globulus</i> within each named country or sub-national region
Chile, India, Spain, Portugal	~ 500 000 - 1 000 000 ha
Ethiopia, Tasmania*, Western Australia*	~ 100 000 - 500 000 ha
Algeria, Ecuador, South Central China*, Tunisia	~ 50 000 - 100 000 ha
Argentina, Bolivia, California*, Colombia, France, Indonesia, Israel, Mexico, New Zealand, Pakistan, Peru, South Africa, Zimbabwe	< 50 0000 ha

Figure 1. Major concentrations of *Eucalyptus globulus* plantations. Source: (ABARES 2019; Diário da República 2015; INFOR 2019; MITECO 2007; Potts et al. 2004).

In this paper, we present an exploration of blue gum plantations in south-west Western Australia, where there has been a decade of plantation decline (in terms of financial value, and area extent) since an initial boom in commodity prices. Similarly to other regions in the world, blue gum plantations have expanded rapidly since the 1990s (ABARES 2016). The highest planting period (1996–2009) peaked with an annual addition of 102,200 ha in 2008–2009 (ABARES 2016). This expansion was linked at the national level with the Australian Federal Government’s Plantations for Australia: The 2020 Vision, targeting regional wealth by encouraging ‘international competitiveness’ while supplying the annual trade deficit in forest products (Australian Government 1997). Through fiscal incentives, this programme led to the emergence of Managed Investments Schemes (MIS) in retail forestry, which are a form of collective investment scheme that enables a group of investors to contribute capital that is pooled to produce financial benefit. MIS distribute benefits pro-rata with the level of investment. The timing of the collapse of several MIS-based companies in 2009 was associated with the Global Financial Crisis (GFC) (Brown, Trusler, and Davis 2010), although the seeds for their collapse were sown well in advance of the GFC. At a more nuanced level, some of these elements included: pre-existing adverse social responses to the MIS model due to the rapid expansion of plantations (Mercer and Underwood 2002); the unrealistic expectation of timber production (Lawrence 2008); the unbalanced treatment between plantations and other types of agriculture (O’Toole and Keneley 2010); and diverse intangible motivations regarding sense of place and rural development (Tonts, Campbell, and Black 2001; Williams et al. 2008). To date, stakeholder and public attitudes towards blue gum plantations have been largely negative. However, contrary to other global regions of blue gum production, disenchantment was rapidly followed by the restoration of previous or alternative land uses in south-west Western Australia, with a decline in the total area of blue gum plantations of over 30,000 ha in the four years following the collapse in the value of the commodity in 2009 (ABARES 2016). While the expansion

and consolidation of blue gum plantations in most regions worldwide has been relatively stable (López-Sánchez et al. 2021; Potts et al. 2004), we argue that the early industrialisation of blue gums in Western Australia and the subsequent periods of recession provide a unique case study to explore the causes of land use change.

In locations around the world, local opposition towards blue gum plantations has centred on multiple aspects, ranging from perceived adverse ecological impacts of the species, to perceived deficiencies in management practices and policy-making (Deus et al. 2018; O'Toole and Keneley 2010). Recently, a group of local governments in Spain declared themselves as 'Eucalypt-Free-Zones', and demanded that the Spanish government designate *Eucalyptus globulus* as Invasive Alien Species (IAS) (Cidrás 2020). The rationale advanced by the dissenting local governments included a mix of social factors and tree species-specific attributes. This combination of contextual and species-specific factors is challenging for professionals working, for example, in the development of IAS catalogues, who must assess a positive economic evaluation of a species alongside negative environmental impacts of that same species (Novoa et al. 2018). In this sense, we argue that specific knowledge about the causes of rejection of blue gums would facilitate better development of strategies and regulations related to the management of this planted species.

Hence, our research poses the question: Is it the specific nature of the commodity itself that is the source of unfavourable perceptions and reactions from local communities, or is it the place-based context within which plantations have occurred? To investigate this question, we followed two lines of enquiry. First, a contextual understanding was developed through exploring research participants' lived experiences throughout a substantive period of time (~25 years), in an area where blue gum plantations surged and then dropped sharply in financial value, followed by a more modest recent expansion. Secondly, we examined the relationship between perceptions and attitudes to understand specific responses to the commodity, throughout the period of plantation forestry. We argue that an integrated analysis of perceptions and attitudes held towards a commodity can elucidate the source of individuals' multiple responses to the commodity.

In the section that follows, we present a framework for understanding land use conflicts associated with blue gum plantations through people's perceptions and attitudes, drawing on theory from political ecology. Critical geographers have underlined that the understanding of land use transitions through individual and collective experiences are essential to understand such conflicts (Curry, Koczberski, and Selwood 2001; González-Hidalgo, Otero, and Giorgos 2014; Mayntz 2001; Tonts and Greive 2002) especially when controversial changes have been institutionally justified as 'development' (Ojeda 2012; Päül 2013). Taking into account that perceptions differ across space and over time (Harvey 1996; Short 1991), we assume that the decision-making process of a particular actor mentally fluctuates between the perception of the context and the rational evaluation of that context (Estévez et al. 2015; Seabrook, McAlpine, and Fensham 2008). Next, the methods and features of the study area are presented, followed by the results, including an analysis of local stakeholders' responses towards blue gum plantations. Last, the discussion provides new perspectives on stakeholder behaviour reflecting on the broader global context, emphasising that stakeholder interactions around plantations have typically been divergent across a range of issues, from accessing information, to disseminating ideas, all the way to the final decision-making process (González-Hidalgo and Zografos 2019; Hohenthal, Räsänen, and Minoia 2018).

Understanding land use conflicts through perceptions and attitudes

Conflicts around land use are commonly framed as situations in which incompatible interests concerning the use of land involve actors or groups of actors (Hersperger et al. 2015; Von Der Dunk et al. 2011). To aid in understanding land use conflicts, the framework of political ecology explores the relationships between social groups and ‘a politicised environment’ (Bryant and Biley 1997, 26). The study of such relationships tends to emphasise the critical role of power relations in land use transitions (Gerber, Veuthey, and Martínez-Alier 2009; González-Hidalgo and Zografos 2017; Martínez- Alier 2002). Since the inception of political ecology as an approach in the 1980s, researchers have explored the dynamics of capital in rural spaces and how the derived environmental costs are unequally shared, particularly in forest ecosystems (González-Hidalgo and Zografos 2017; Osborne 2015). Political ecology aims to analytically transcend the policies of environmental management to include social welfare concerns within such policy making (Leff 2017). Recognition of the role that people’s perceptions and attitudes play in land use transitions has become a foundation for the identification, analysis and resolution of land use conflicts (Hohenthal, Räsänen, and Minoia 2018).

Perceptions constitute a socially constructed and continuously shaped view of a particular event, or knowledge of a topic (Gómez-Baggethun, Corbera, and Reyes-García 2013). For instance, the recognition of an economic hazard – e.g. a farmer observes a downgrade of wood chip prices – constitutes a form of perception (Slovic 1987). Beyond self-interpretation, external influences such as traditional media (Siltaoja and Vehkaperä 2010) or social media (McGregor 2019) have an impact on perceptions. Hence, perceptions coexist with the material and discursive reality in which people live (Vedwan 2006). Viewed through a political ecology lens, perceptions constitute a vivid source of information of the social context that drives power relations (Nathan James Bennett 2016; Krott et al. 2014) across multiple spatial scales (Zimmerer and Bassett 2003). Often, perceptions around practices within a shared setting contribute to the development of particular identities (Hoelle 2011) that, when shared among many individuals, constitute legitimacy in social groups. This politicised setting has been attractive to scholars working on the topic of large-scale blue gum plantations (see for example Barlow and Cocklin 2003; González-Hidalgo and Zografos 2017; Hohenthal, Räsänen, and Minoia 2018). Research on perceptions associated with blue gum plantations has highlighted asymmetric power relations (Barlow and Cocklin 2003), meanings (Hohenthal, Räsänen, and Minoia 2018) or emotional geographies (González-Hidalgo and Zografos 2017). These works using blue gum forestry as a case study reflect a central tenet of political ecology: focusing on individual responsibility obscures power and political reactions.

Attitudes are rational evaluations of a particular situation (Vaske and Donnelly 1999). In simple terms, attitudes constitute evaluations of perceptions (e.g. a farmer shows positive attitudes towards tree plantations when perceiving the increasing demand for biomass). Attitudes are also framed within conceptual models as an intermediate factor that correlates values (i.e. enduring and stable mental constructs) with behaviours (i.e. the intention of action) (Estévez et al. 2015; Schultz et al. 2005; Williams et al. 2008; Williams, Nettle, and Petheram 2003). Psychological models have been proposed regarding this human-environment linkage. Particularly, the Cognitive Hierarchy Theory (CHT) has suggested that when two compared variables share a common context, strong correlations between the variables are expected (Whittaker, Vaske, and Manfreda 2006). For example, values regarding the landscape should predict attitudes towards plantation forestry. Based on this cognitive theory, researchers have evaluated attitudes of local communities towards blue gum plantations (Dehnen-

Schumutz, Chas-Amil, and Touza 2010; García-Llorente et al. 2008; Mercer and Underwood 2002; Sharp, Larson, and Green 2011; Tadesse and Tafero 2017). Research on attitudes has been increasingly based on quantitative methods, such as questionnaires, in Williams et al.'s view (2008, 13) because they 'provide a more representative understanding' of the problem. Political ecologists tend to criticise research approaches focused only on attitudes or values, as such approaches can be viewed as diagnoses-oriented, individualising and often disconnected from political issues (González-Hidalgo and Zografos 2019).

The recognition of the role that perceptions and attitudes play in forestry has become the foundation for conflict analysis for several authors (see for example Calviño-Cancela and Cañizo-Novelle 2018; González-Hidalgo and Zografos 2017; Maryudi 2011; Mercer and Underwood 2002; Williams 2014, 2011). However, attitudes and perceptions have largely not been analysed in a holistic way in research on land use conflicts in forestry (Estévez et al. 2015). For example, in Williams, Nettle, and Petheram's (2003) analysis of public responses to forestry plantations, a novel exploration of perceptions and attitudes was applied, although the two constructs were analysed with a degree of isolation from one another. Similarly, Calviño-Cancela and Cañizo-Novelle (2018) neatly showed how stakeholders perceive and are aware of wildfires, including a discussion of attitudinal aspects that were not formally analysed in the research. More recent work by Shackleton et al. (2019) acknowledges their own interchangeable use of the two concepts. Based on a literature review of conflicts around invasive species, Estévez et al. (2015) have integrated perceptions and attitudes in a common Cognitive Hierarchy System model. This integration emphasises the difference between how an environmental commodity is perceived and how the community responds to the commodity. The combined study of perceptions and attitudes in a group of stakeholders is therefore a step forward towards the politicisation of what have traditionally been seen as individualising approaches (Estévez et al. 2015). This combined analysis also brings to light not only perceptions of the environmental commodity under discussion, but also contingent contextual features that affect attitudes to the commodity. Adger et al. (2003) suggest that exploring the social dimension of an environmental commodity should encompass the analysis of at least three geographical features: institutions, which can either cause or mitigate controversy around the environmental commodity, as well as shape public opinions (Clever 2000); scale, which moderates the different levels at which decisions on the commodity take effect (Wyborn and Bixler 2013; Zimmerer and Bassett 2003); and the context, which encompasses all physical (e.g. climate, land fragmentation, etc) and social (e.g. communities, relations, etc.) aspects related to an environmental commodity.

A combined analysis of perceptions and attitudes is presented in this paper. Such combination is justified by the fact that behaviours are not only cognitive, but also emotional and contextual, as they are based on what individuals feel and live (Harrison and Loring 2020; Kapitza et al. 2019). Combining perceptions with attitudes emphasises the contextuality of environmental decisions (see for example the discussion of González-Hidalgo and Zografos 2017). In the following section, we present the context of our study area and specify the social research methods used to address the study of perceptions and attitudes around blue gum plantations.

Study area and methods

Fieldwork was conducted in September and October of 2019 in the Shires of Bridgetown–Greenbushes (population 4,670) and Boyup Brook (population 1,702), south-west Western Australia (Figure 2). The

locations were selected based on geographical characteristics. The Shires sit within one of the driest areas of the south-west hardwood plantations. In Boyup Brook, precipitation has declined from an annual average of 722 mm/year between 1960–1969 to 542 mm/year in 2010–2019 (Bureau of Meteorology 2020). As blue gums generally require an average minimum rainfall of 600–700 mm/ year, this area constitutes the northern limit of one of the largest plantation-growing regions of Australia. Additionally, from 2009 onwards there has been a notable movement to convert former blue gum plantations into alternative land uses within the study area (Lower Blackwood Catchment 2016). Finally, Bridgetown has experienced an incomplete transition from a productivist to a post-productivist place, and tourism is expected to compensate for downturns in agriculture and forestry. Taken together, these characteristics give rise to a dynamic landscape of land use change, in an area of interest for the blue gum industry.

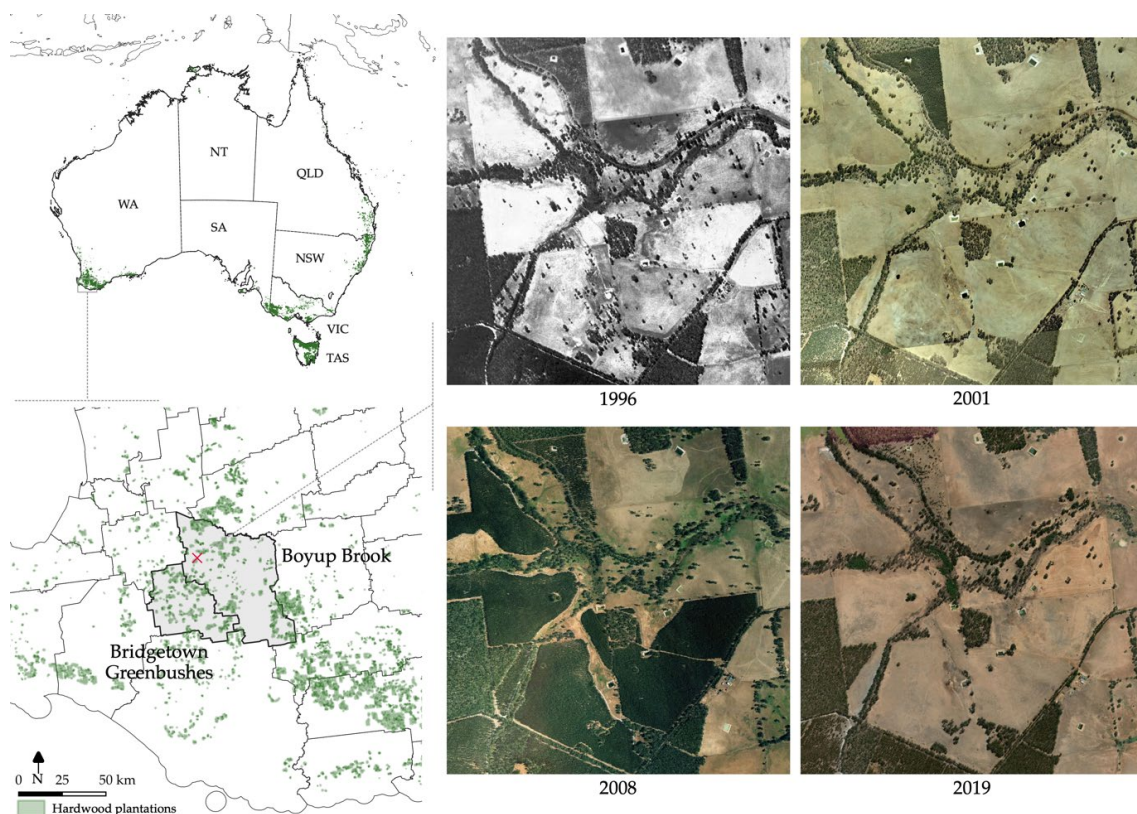


Figure 2. Map of the study area and temporal change in land cover associated with blue gum plantations. Source: (Australian Government 2018; Landgate 2020). Note: Images at right show a typical changing pattern of land cover in the study area, as land that had long been cleared was converted to plantation forestry between 2001 and 2008, and then cleared again for agriculture between 2008 and 2019. Figure produced by Diego Cidrás. © 2021 Western Australian Land Information Authority Reproduced by permission of the Western Australian Land Information Authority.

The study area has experienced a ~25 year period of policies on rural development that have been characterised as neo-liberal, with an emphasis on individualisation (Williams 2014). Lockie, Lawrence, and Cheshire (2006) highlight that such processes of individualisation addressed the environmental and social costs of productivist agriculture to local communities. According to the authors, individualisation has had two major implications in rural Australia. First, the productivist imperative to link into international markets, upon which agriculture and other rural economies increasingly depend. Secondly, the uptake of post-productivist options like rural tourism, that are ‘embraced by those whose economic existence in primary industry has become marginalized (those seeking to remain in rural areas

yet lacking any income derived from natural resource-based industries)' (2006, 8). Therefore, the boundaries of what is socially acceptable or unacceptable in terms of natural resources management are continuously negotiated among productivist and post-productivist groups.

During visits to the study areas, we conducted 22 semi-structured, in-depth interviews with a purposive sample of farmers, residents, and workers in the natural resource management sector, and took additional notes based on observations. The research did not focus on choosing a representative sample of the whole population, but rather 'to understand how individual people experience and make sense of their own lives' (Valentine 2005, 22). Half of our participants (n=11) are or were directly involved in the economics of blue gums and are still today productivist actors; the other half (n=11) are either residents or workers currently involved in post-productivist activities in the area. Criterion and snowball sampling were applied to this research with the purpose of achieving a gender balanced (11 male, 11 female) and diversified representation of participants regarding their activities and land use transitions in the last ten years. The interview schedule consisted of five content-focused areas:

- Getting to know the interviewee: open discussion around informant's experiences, duties or connections with Bridgetown/Boyup Brook.
- Personal construct of the place: exploration of past and present meanings and emotions, which construct current geographical understandings of the study area.
- Practices within the Shire: exploration of personal events and alliances that influence formal and informal management practices in the area.
- Perceived transitions around land use: discussion of past, present and potential land use change events within agroforestry spaces.
- Involved stakeholders: discussion about other stakeholders taking part in agroforestry practices, namely public institutions and external actors. Exploration of perceived interests and expectations.

Interviews were anonymous; therefore, pseudonyms are used throughout the text. Interviews were recorded, transcribed and later analysed in NVivo 12 through a thematic- coding approach, which captures through themes relevant pieces of information in relation with the research question, while representing some level of meaning within the data (Braun and Clarke 2006). The initial approach resulted in 149 perception- related codes. Perceptions were then combined with an additional codification of three generic attitudes (positive, negative, neutral). Therefore the whole data set was initially processed under this two-level coding approach. In the first instance, all codes were allocated to one of four generic topics (community, policy, environment, economy), thus aiming to observe and preserve the context through the collating process (Bryman 2016). Next, following Braun and Clarke (2006), we attempted to go beyond the surface meanings of our data with the purpose of telling an accurate narrative from our source materials. To do so, we refined and aggregated codes with the purpose of making meaningful contributions to answering our research question (Braun and Clarke 2006), i.e., identifying forms of controversy around both the blue gums and their contextual policies. The three resulting themes, which structure our results, respond to a set of perceptions and their associated attitudes towards each social-political stage since the major peak of blue gum plantations (see Figure 3). Each theme is illustrated with vivid examples or extracts that provide a collective story of the data, and provide an analytic narrative. In line with Collier and Scott's (2009) dual approach to narratives in conflict analysis, narratives are specifically examined with respect to the commodity and its context.

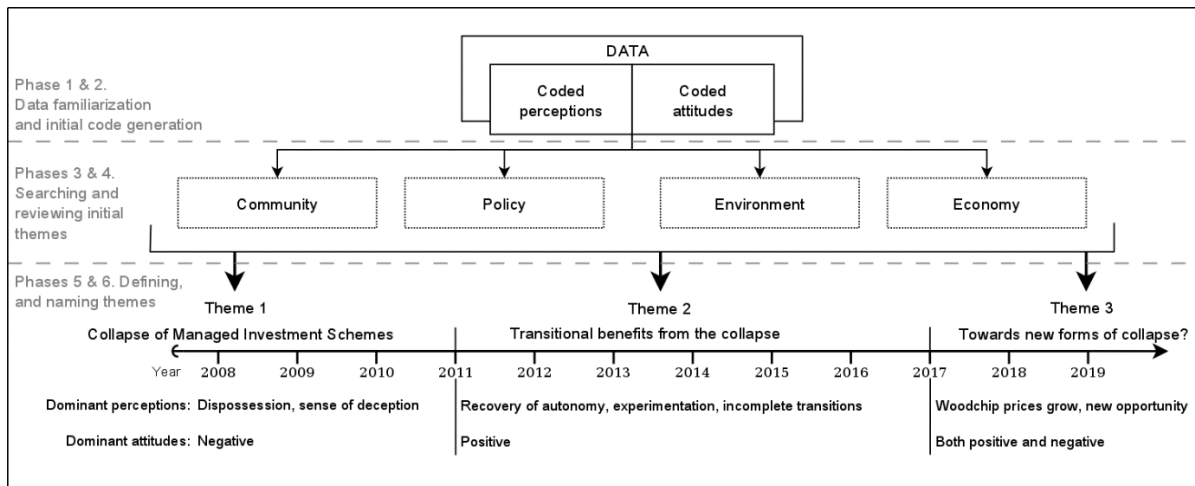


Figure 3. Representation of the coding process and the resulting themes in a timeline.

Results

In this section, we present an analysis of the three themes that arose from the interviews. The three themes have a strong temporal component, as they correspond to (1) the period associated with the 2009 collapse of forestry schemes; (2) the transitional period between approximately 2011 and 2017; and (3) the current context of potential re-emergence of plantation forestry. Figure 3 represents these stages in a timeline, summarises dominant perceptions and attitudes from each period. The following subsections explore the three themes in detail.

Overall, participants' perceptions of the environmental attributes of blue gum trees or plantations were mentioned infrequently and without clear reference to specific time periods. The environmental impacts of blue gums reported by participants centred on two perceptions: first, that soil quality declines after one or more rotations; and secondly, that water use is elevated compared with other plantation tree species. Other perceptions include the ability of the tree to persist after fire, and the reduced degree of biodiversity observed within plantations. In contrast with environmental attributes, the perceived impacts of the commodity on broader social issues (such as the aesthetics of a land plot), were more clearly differentiated between the different time periods (i.e. our three themes).

Common perceptions of the collapsed managed investment schemes (MIS)

During many interviews, conversations about the arrival of blue gums in the study area promptly resulted in participants' recollection of the 'collapse of MIS [Managed Investment Schemes]' [Matilda, Jack, Layla]. These schemes led to an accelerated arrival of external capital which still is associated with negative attitudes to this day, even to those individuals who were awarded the best leasing contracts in the 1990s:

They've got someone come to the farmer and knock on his door and say: 'Hey, do you want to sell me your land or let me lease it to grow trees?' So, they felt pressure. [Peter]

Uncontrolled external investment as the main driver of past conflict was commonly nominated by stakeholders. For instance, a representative from WA Plantations and two regenerative farmers on current ex-blue gum blocks reported common issues regarding the 'very unethical' [Layla] arrival of blue gum plantations in the south-west, constituted in their views by: (1) the arrival of speculators; (2) the inflation of

land value; (3) the overdependence on external markets; and (4) the disruption of their sense of community. Overall, in the rural 'shrinking communities' [George, Charlie] of Bridgetown and especially Boyup Brook, the massive arrival of blue gum plantations was initially seen as an irresistible source of income:

You can't blame the people 'cause they [investors] were paying big money. [Mason]

One respondent spoke about neighbours who had sold or leased their blocks and left the area, and assumed that such overwhelming remuneration had influenced their decision making process:

My neighbour...he said to me: 'Mason, you couldn't afford to pay that much for that land', that's what he said to me...[starts laughing] and he was right! [Mason]

Our interviews occurred ten years after the collapse of most Managed Investment Schemes in the area (O'Toole and Keneley 2010). All research participants, including Natural Resource Management (NRM) workers, expressed confusion as to why the Federal Government promoted plantations. The role of the Government tends to be criticised:

Every time there's Government incentives, things get messed up. [Hudson]

MIS decline was seen as a consequence of political omission, for instance:

In 2010 or 2009, it was there...no longer political strong push for it...was only left to the business to do their business (...) so the financial investment dropped off. [Charlie]

And

So, overnight, you couldn't, eh, invest in a Managed Investment Scheme or claim the investment. [Jack]

In parallel, stakeholders reported a devaluation of the NRM agency. In terms of community engagement, one respondent highlighted that the regional NRM organisation operating in the area – the South West Catchment Council – lost significant capacity building when the Government shifted from upfront grant funding to payment on completion:

So that means it's now being a fully commercial...means you have to have the ability to handle cash flow, all of these things, which volunteer organizations just can't do. They cannot do it. [Xavier]

The perceived collapse of MIS in 2009 led to a significant shift in attitudes towards blue gum plantations. Disillusionment with this commodity was rapidly succeeded by a collective desire to recover, and 'make a living' [Various respondents].

Transitional benefits of the collapse of MIS

The collapse in the value of blue gum plantations in 2009 was perceived either as an opportunity or a necessity to alter land uses in the south-west of Western Australia. With reference to the 'transitional' time period (c. 2011–2017), many interviewees had considered the idea of transitioning into more traditional land uses. In Boyup Brook, participants predominantly self-identified their 'traditional' community as conservative by linking a conservative approach with social-technical issues – such as

the deliberate use of pesticides by most farmers. In contrast, Bridgetown appeared to be in a late stage of rural commodification (see Greive and Tonts 2002) and residents – namely non-farmers – positively associated ‘tradition’ with the aesthetics of agricultural landscapes. Considered against the devaluation of land prices during the transitional period, respondents from both towns expressed the perception that a transition into an alternative to blue gums could reinforce traditional rural landscapes.

Although land values may have declined, a perception shared among participants was one of opportunity for economic activity and community-building. There were instances where bankrupt investors terminated plantation leases on land held by absentee landowners. As one respondent recounted:

Instead of going back into trees again for another rotation, they [blocks of land] were being sold. And that's the little window where we bought our farm. [Max]

This economic window facilitated a set of changes in both Shires, positively expressed in terms of community-building. For example:

The younger generation of farming families around are seeing it as a great opportunity to get into farming. [Matilda]

Similarly, two respondents [Jack and Mason] expressed positive attitudes towards having ‘new neighbours’ in a context of depopulation. New opportunities were also mentioned by several respondents, for example:

I went through a divorce and had to start again. And it's what I could afford.... [Charlie]

and

At the moment, all the commodity prices are quite good, farmers are reluctant to sell their land to put trees in. [Max]

Overall, despite the challenges stemming from the blue gum crisis, landowners reflected positively on their own ability to adapt. NRM workers operating in the area expressed a certain amount of scepticism in relation to landowners’ adaptation efforts, for example:

It's just the market that is driving that. [Xavier]

The recovery of traditional farming was accompanied in Bridgetown and Boyup Brook by the emergence of regenerative farming on ex-blue gum blocks, led in some cases by newcomers. Beyond the affordable prices of the land, three of our respondents reported that blue gum plantations had not been exposed to many synthetic fertilisers for at least one rotation (approx. 10 years). This was perceived as an opportunity to start a different kind of farming. However, at the point of starting such new enterprises, they encountered substantial economic difficulties regarding the transition into pastoral land use. Redoing the fences and, more importantly, pulling up the tree stumps were pending tasks as these items were not included in many of the previous leasing contracts. Once they realised that there were no public funds available to restore the blocks, many of them decided to defray costs by

introducing sheep in their properties in the light of a growing market in Australia (Figure 4). Negative attitudes towards the remaining blue gum plantations were essentially based on the fact that potential transitions into alternative land uses were costly for the farmers.



Figure 4. Modern transitional blue gum landscapes in the south-west of Western Australia. Note: On the left, landowner burning blue gums. On the right, sheep grazing on an ex-blue gum block. Pictures by Diego Cidrás.

Towards new forms of controversy

Beyond the dominant perception that more desirable land uses were progressively recovering following the blue gum collapse in 2009, many participants hesitantly suggested that a new wave of plantations might come back in the near future. Since 2016–2017 the south-west of Western Australia has registered an increase in the extent of new hardwood plantations, mostly blue gums. Compared to the 2000–2010 period, the ownership structure of plantations has shifted in two senses: the decline of MIS, replaced by new forms of institutional investors (Figure 5); and an increase in the percentage of private owners and timber companies. Respondents' perceptions of the underlying drivers of this new planting trend were unified in both study areas on the general assumption that the market will reformulate decisions around land use:

Soon as the economic value is there, you start getting companies looking at it. Soon as companies start looking at it and investments start getting made, farmers will start looking at it [Xavier]

Similarly, participants who identified external investment as an agent of change presented a negative attitude:

Does everybody expect that blue gums will go right away? No. Because of the two big companies; both of them owned by different Japanese companies for the purposes of sourcing blue gum chip to the paper mills in Japan. So they've got investment. [Jack]

Participants reported a more moderate set of attitudes towards current changes compared to our discussions about the previous wave of plantations, usually sustained on the basis that MIS are no longer operating in the south-west.

Our interviewees assumed that this potential re-emergence of blue gum plantations will be less controversial as they consider that it is now themselves and not external investors making the decision to plant:

Well, um...there's a few more people growing blue gums by themselves, on their own, because the price has come up and...often they do it...do as much of it themselves and get just a contractor in when they like.... [Matilda]

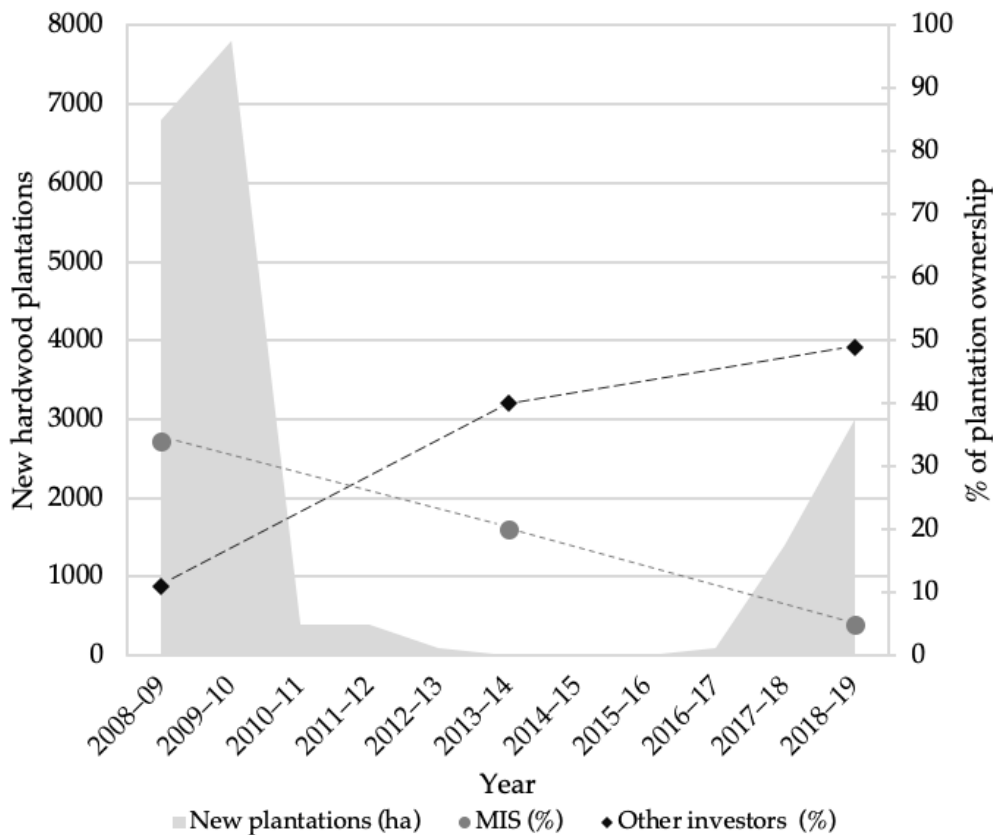


Figure 5. New hardwood plantations (>90% = *Eucalyptus globulus*) in Western Australia compared to the main shift in plantation ownership between 2008 and 2019. Note: Graph by Diego Cidrás. Data source: (ABARES 2016, 2019).

While perceptions of negative impacts derived from plantations, such as human depopulation or water use, remain the same, planting blue gums is becoming collectively more acceptable. In the eyes of people involved in the timber industry, acceptance of blue gums is predicated on the decline of community opposition towards the gums, and the capitalist mentality of landowners:

Some people were very strongly opinioned against the blue gum plantations going in, and some of those same people are now putting blue gums on their own properties. Well, this is going back a few years now. You know, you get back 20 years when farmers were really against blue gums, and then a few years later, there's some of these farmers have actually put blue gums in their property. I mean, it was a new industry then, and some people like it and some others didn't like the idea (laughs). [Jacob]

And

People that are putting blue gum plantations back in are doing it because they see that there is going to be a shortage coming up in that industry in, you know, 10, 15, 20 years' time. Because there's so many plantations that are being harvested and then converted back to pasture. [George]

Even in a context of relative welfare of farming and agriculture, a slight recovery of the blue gum industry altered the decision-making process in the south-west. Planting *Eucalyptus globulus* is still perceived in Bridgetown and Boyup Brook as something socially and environmentally disrupting, but economically safe in the short term, even if low rainfall conditions limit plantations in the near future. Consequently we identify an evident diversification of attitudes and behaviours towards the return of plantations in the area: some farmers remain dissenting, while others start planting. Reflecting on their own environment and lifestyle, future scenarios remain unclear beyond current responsibilities for many respondents. For example:

I don't know what I'll be planting in 15 years. [Mason]

Discussion: the role of power in the plantation process

A central aim of this paper was to elucidate the source and form of local stakeholders' responses towards blue gum plantations. In the south-west of Western Australia, this commodity constitutes one of many crops subject to price fluctuations due to the dependence on external markets. Our results depict a marked change in perceptions and associated attitudes towards blue gums over time, aligned with fluctuations in the commodity price. External market inputs affecting the value of pulp exerted strong influence on the local framework of perceptions and therefore on individual decisions around land use. These results are partly reflective of Williams (2014) work which obliquely introduced time as a driver of acceptability of plantations; and are aligned with Seabrook, McAlpine, and Fensham (2008), whose research on landscapes dominated by gums identified time as a commonly ignored, but influential variable in this controversy. In the following paragraphs we discuss the role of power through a retrospective view of the plantation process.

In a context in which respondents vaguely identified public policies as drivers of the controversy, power acquires a community versus market dimension. When reflecting on the periods of blue gum expansion, most of our participants reported unequal power relations which transcended their individual decisions. MIS were based on economic incentives, the ramifications of which landowners were minimally aware aside from potential financial benefits. In terms of Krott et al.'s (2014) actor-centred power approach, in which power is evaluated through coercion, incentives and information, MIS would not only conform to unequal power relations with the emphasis on incentives, but also due to the limited information around the environmental aspects of plantations, such as water consumption or soil degradation. Such sources of inequalities support Martínez-Alier's (2002) and Gerber, Veuthey, and Martínez-Alier's (2009) proposition of taking a political ecology approach to the blue gum issue. Although political ecology has been typically addressed and discussed in certain countries of the Global South with more evident instances of coercion (Krott et al. 2014; Maryudi 2011), our results show that a liberalised Global North context like rural Australia can also reproduce coercive external forms of land grabbing.

Local stakeholders' attitudes to power relations appear in our results as conditioned by the constant need to overtake economic difficulties. Criticisms of unequal power relations were therefore tempered by the desire to secure income and remain in the territory. However, from the collapse of plantations in 2009, the perceived concentration of land control caused by the MIS triggered a local response towards self-management and a return to activities that preserve traditional rural landscapes (e.g. regenerative farming). This is consistent with González-Hidalgo and Zografos (2017) findings for an equivalent case study, where beyond the access and use of land, the congregation of proactive attitudes has motivated

local communities to develop alternatives to industrial tree plantations. In our study, [Mason] was a clear example of a farmer reproducing a ‘liberal ideal’, in which his farming activity could be developed with the minimum intrusions of other actors; but who also exhibited negative attitudes around inequalities due to external inputs, such as the instability of wood chip prices. Overall, our results provide in this first instance support for Estévez et al.’s (2015) approach to stakeholders’ responses to invasive species, in which the authors merge the intrinsic with the contextual, through the inclusion of perception analyses. The question remains to be answered: to what extent is the social context relevant in this controversy?

Contextual effects over plantations

Although the conceptual differences among values, attitudes and perceptions are challenging for the researcher, our case study has demonstrated an influence of perceptions on attitudes towards blue gums. In line with Bennett’s (2016) discussion on the role of perceptions in environmental management, the transition from the first to the second stage of blue gum forestry shows how the perception of risks shapes collective evaluations of conservation. Therefore our results reflect how a particular controversy acquires by means of time and space a completely different dimension. This ‘dynamic tension’ (Vedwan 2006) stands with Zimmerer and Bassett’s (2003) call to congregate the scales of social and ecological processes. Contextual perceptions of both social and ecological processes become essential for analysing land use conflicts, echoing González-Hidalgo and Zografos (2019), who highlighted the specific role of these two factors in stakeholders’ views of forestry plantations.

Our results show how market instability has transcended its economic dimension by being an agent of land use change. The analysis of participants’ perceptions on such market events resulted in distinct attitudes towards tree plantations, depending on each political context. Plantations have followed at least three different social-economic stages in the south-west of Western Australia: (1) a neo-liberal programme towards the expansion of plantations; (2) the collapse in the value of blue gums and consequent restoration of alternative land uses; and (3) the beginning of a new wave of plantations. This sequence reveals the importance of exploring long-term emotional narratives, as shown by González-Hidalgo and Zografos (2019). If we contrast the two periods of blue gum expansion in Western Australia, it is clear that the absence of MIS-based programmes or massive external capital in the current period of expansion has led to a significant reduction of public opposition and controversy around the commodity. The economic downgrade in the 2000s of the regional NRM agency operating in the area comprises another contextual effect. This relegation has limited capacity building and trust between local actors and bureaucrats, hence incurring a source of controversy around plantations. Our results are consistent with Adger et al.’s (2003) analysis on the pragmatic role of institutions in causing or mitigating controversy around an environmental commodity. As highlighted by the authors, institutions ‘define the rules of the game in formal and informal ways’ (2003, 1105).

On the other hand, a set of perceptions expressed regarding plantations have stated the focus over the commodity itself. Coalitions between different valuations of rural landscapes in Bridgetown (predominantly aesthetic, historical and social) and Boyup Brook (notably utilitarian and resilient) resulted in a common but transitional rejection of blue gum plantations. When discussions turned into specific attributes of this species – such as water consumption or its economic value – participants reported a notable significance of the blue gums as ‘the problem’ [Amelia]. Local concerns over blue gum plantations reflect the protection of endemic landscapes, which is entirely consistent with

analogous case studies worldwide, for example, Hohenthal, Räsänen, and Minoia's (2018) research on local communities' rejection to blue gum plantations in the Taita Hills, Kenya. Also, it is self-evident that there remain gaps in attitudes between groups of stakeholders, namely between timber agents and critical farmers or residents. Yet, beyond a roughly stable set of perceptions of blue gum plantations, the context within which the commodity sits has a higher influence on the controversy itself than the specific commodity.

Conclusion

Our study suggests firstly that long-term and situated analyses are relevant to the understanding of local stakeholders' views on blue gum plantations. A political ecology approach aids in understanding the controversy as it brings to light not only individual attitudes, but also political subjectivities and the emotions in which land use changes sit. The obtained results suggest, in line with political ecologists, the importance of perception analyses to understand public acceptance of forestry plantations. Also, the results highlight that such a broad controversy (in terms of time and space) informs a collective, but changing public image of tree plantations, as the stakeholders live and acquire over time and space sets of experiences and perceptions around the problem. Therefore, we conclude, first, that the context hegemonically defines negative attitudes towards blue gum plantations. Also, we conclude that policy and the social-political context around this commodity have the power of re-orienting social perceptions on this particular land-cover. Therefore, we argue that these findings empower institutions in spatial planning and forestry to develop a harmonious distribution of industrial blue gum plantations.

In Western Australia, we first observed how an accelerated shift towards the external investment in blue gum plantations caused in the short and long term a massive rejection of the model by local communities. Although the restructuring of plantation ownership that followed has not differed much, in numbers, with the previous structure, the disappearance of the MIS has at least temporarily reduced controversy. However, we argue that new forms of controversy may emerge at any time if mistrust in public institutions and low local engagement remain. We suggest the restoration of a more autonomous model for regional advice agencies like the SWCC in Western Australia. These agencies may facilitate not only a significantly higher involvement of associations in land care projects, but also reinforce trust by the public. Building trust throughout these regional organisations could facilitate new forms of innovative governance approaches, such as adaptive co-management (Karimi and Hockings 2018). Finally, understanding how local perceptions influence the uptake and acceptance of plantation forestry could be important for establishing successful 'carbon forestry' projects under Australia's Emissions Reduction Fund (established in 2015 under the Carbon Credits (Carbon Farming Initiative) Act 2011). As countries around the world look for further opportunities for climate change mitigation, such schemes may become more prevalent, with long-term success contingent on local support.

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