Revealing power dynamics and staging conflicts in agricultural system transitions: Case studies of innovation platforms in New Zealand

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\textbf{ABSTRACT}

Innovation platforms (IPs) that support agricultural innovation to enable transition processes towards more sustainable agriculture provide a space where conflicts of interest among actors in the existing agricultural system (the so-called incumbent regime) may play out. Sometimes these conflicts over how actors will benefit from an action are not revealed until actors are brought together. However, a barrier to change occurs when IP actors use their existing power to mobilise resources to influence if and how individual and collective interests are aligned. In the context of agricultural innovation and transitions, this paper uses the power in transitions framework (Avelino and Wittmayer, 2016), along with analytical perspectives on conflicts and role perceptions, to understand how consciously staging or revealing conflicts of interest among IP actors changed role perceptions and power relations among these actors. The paper explores this topic in two IPs addressing agricultural production and sustainability challenges in New Zealand's agricultural sector. Conflicts were staged in IPs when one group of actors mobilised resources that enabled them to move existing power relations from one-sided, to synergistic or a mutual dependency. This enabled conflicts to be acknowledged and solved. In contrast, conflicts were not staged when actors mobilised resources to maintain antagonistic power relations. Our cases demonstrate that staging conflicts to change actors’ role perceptions is an important intermediary step to forming new power relations in the agricultural system. Our findings highlight the need for IP theory to conceptualise power relations in IPs as context specific, dynamic and a force shaping outcomes, rather than solely a force exerted by actors in the incumbent regime over IP actors.

1. Introduction

There is growing recognition that innovation to support transitions towards sustainable agriculture involves complex social, market, institutional, technical, and practice changes in the agricultural system (Klerkx et al., 2016; Blesh and Wolf, 2014). This has contributed to increased use of innovation platforms (IPs),\textsuperscript{1} which are a means to connect and motivate multiple stakeholders around a common goal or purpose (Esparcia et al., 2015; Nederlof et al., 2011; Schut et al., 2014). These IPs bring together multiple actors in interactions seeking to shape new long-term visions (Cullen et al., 2014; Koch, 2004) and potential pathways to change the existing agricultural system (incumbent regime) (Cullen et al., 2014; Fuchs and Glaab, 2011; Koch, 2004; Rossi et al., 2019). While the potential of IPs is promoted to address complex agricultural challenges, such as climate change and food security, it is increasingly acknowledged that these arrangements need to interact with dominant actors from the incumbent regime (Eidt et al., 2020; Elzen et al., 2012; Ingram, 2015; Klerkx et al., 2010; Lamine, 2011; Rossi et al., 2019), where technological, organisational and institutional arrangements support the dominant mode of agricultural production (Ingram, 2015). Bringing these actors together in IPs provides opportunities for actors to exercise power to change or maintain existing roles (Avelino and Wittmayer, 2016; Cullen et al., 2014; Eidt et al., 2020; Kukk et al., 2016; Martin et al., 2015; Smink et al., 2015; Rossi et al., 2019). For example, in an institutional diagnosis of value chain

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\textsuperscript{1}IPs might also be referred to as innovation networks, multi-actor platforms, learning and innovation networks for sustainable agriculture, and communities and networks of practice (Ingram, 2015; Kielu et al., 2013; Oreszczyń, 2016).
development from two IPs in Ghana, Osei-Amponsah et al. (2018) found donor’s interests and roles in the platform were to prioritise business and market development, while NGOs attempted to prioritise farmer empowerment and poverty alleviation. In this case, in order to make use of and align with the power of donors, NGOs shifted to prioritise market development to secure legitimacy with donors, while continuing farmer empowerment activities (Osei-Amponsah et al., 2018). Thus, when actors with different roles in society, such as donors, environmental regulators, NGOs, researchers, farmers, agribusinesses and industry organisations, participate in IPs, these arrangements can be a space to intentionally play out conflicts of interest arising from differences in how actors benefit or lose from changes in access, use and distribution of resources, and hence reshape roles and power relations leading to systemic change in the incumbent regime (El Bilali et al., 2018; Sørensen, 2014; Rossi et al., 2019).

These conflicts are seldom acknowledged or made explicit, especially when existing power relations shape the dynamics of interactions among IP actors, including: (i) who participates (Eidt et al., 2020); (ii) what is in scope (Cullen et al., 2014); (iii) the extent to which joint learning occurs (Davies, 1994; Rossi et al., 2019); and (iv) the extent to which conflicts are mediated or suppressed (Kenis et al., 2016; Sørensen, 2014). To suppress conflict powerful actors may, for example, use discourse in a way that camouflages conflicts of interest among parties as negotiations guided by consensus (Eidt et al., 2020; Neimark, 2016), potentially resulting in a situation where hidden conflicts remain unacknowledged and unresolved (Espacia et al., 2015; Kenis et al., 2016).

In the context of agricultural innovation to support transitions to sustainable agriculture, our aim is to understand how power relations in incumbent agricultural systems become manifested as conflicts among IP actors, and how the conscious staging of these conflicts can reshape individual actor perceptions of their own and other actor’s roles. This topic has, to date, received limited attention and calls have been made for such research both in the generic literature on transitions (Avelino and Rotmans, 2009, 2011; Smith and Stirling, 2010) and in the literature on agricultural and more broadly rural innovation (El Bilali et al., 2018; Hinrichs, 2014; Lamme, 2011; Scoones et al., 2015; Pigford et al., 2018; Rossi et al., 2019). Our study extends current research on power and conflict in IPs in two ways. Firstly, institutional studies (North, 1990) of conflict in IPs engaging with smallholder development (Akullo et al., 2018; Eidt et al., 2020; Kilelu et al., 2013; Osei-Amponsah et al., 2018) have tended to view conflicts as a barrier to innovation to be overcome through mediation, facilitation and negotiation (e.g., Akullo et al., 2018), or mitigated through ethics of diversity and inclusion (e.g., Cullen et al., 2014). We contend that a potentially transformative role from staging conflicts of interest exists (Avelino and Rotmans, 2011; Hoffman and Loebner, 2016; Rossi et al., 2019). Sørensen (2014) argues that staging conflicts by acknowledging and making them explicit can play a transformative role in innovation by shaping new role perceptions and relations among actors (see also Rossi et al., 2019).

Secondly, we take a multi-actor perspective to look at how the composition and diversity of IPs influences staging of conflicts. While these arrangements are often composed of actors that want to change the existing agricultural regime; for IPs to achieve their goals, they may be influenced by and influence actors from that regime (Elzen et al., 2012; Klerkx et al., 2010; Pigford et al., 2018). IPs need to engage with the regime and make connections to these actors to induce meaningful change (Beers et al., 2014; Klerkx et al., 2010; Rossi et al., 2019); a difficult proposition for actors embedded in the incumbent regime with stable roles, relationships and practices (Spåth et al., 2016). To date, this process has not been widely assessed through the lens of power (Köhler et al., 2019; Markard et al., 2012; Pigford et al., 2018). In order to address these knowledge gaps, the analysis in this paper is guided by three research questions to explore how power is ‘performed’ within IPs as part of transitions:

1. How do power relations among actors in the existing agricultural system (incumbent regime) manifest in conflicts among IP actors?
2. How do platform actors mobilise resources to stage (or hide) conflicts?
3. How does staging conflicts of interest in IPs influence the formation of new role perceptions and power relations among actors in the agricultural system?

To answer these questions, the paper draws on empirical research involving two IPs within a New Zealand research programme, Primary Innovation (AgResearch Limited, 2016; Pinnertshuis et al., 2018; Turner et al., 2016; Vereijssen et al., 2017). Platform implementation included a significant emphasis on relational processes to enable stakeholders to learn and act together to accelerate the pace of innovation and deliver more profitable and sustainable farming practices (King et al., 2019). The first platform involved dairy and beef industry organisations, grazing companies and dairy farmers and graziers, with the goal to develop a strategy for dairy heifer rearing (Pinnertshuis et al., 2018). The second platform involved dairy, sheep, beef and cropping industry organisations, farmers, researchers and government, with the goal to identify nutrient management practices to meet limits for freshwater quality (Pinnertshuis et al., 2018).

We next introduce the framework used for analysing power dynamics in IPs and the incumbent agricultural regime, and subsequent influence on role perceptions and power relations. By power dynamics we mean the way that power relations manifest in conflicts of interest and in turn transform (or not) actor role perceptions and power relations themselves. This is followed by a description of the case study IPs, along with the methods used to gather and analyse the data. We then present the results in terms of the power dynamics and potential changes in the agricultural regime observed in the case studies. The paper concludes with a discussion of theoretical and practical implications for power dynamics within IPs.

2. Analytical framework

Studies of power dynamics in IPs, innovation and transitions in the rural and agricultural literature has evolved over the last two decades to provide an increasingly comprehensive and nuanced understanding of how actor interests, resources and power relations interact to shape transitions (see El Bilali et al. (2018) and Rossi et al. (2019) for reviews). In this literature three ways of conceptualising power can be found (El Bilali et al., 2018). The first is a conceptualisation situated in the multi-level perspective (Geels, 2002); emphasising power by regime actors over non-incumbent IP actors (e.g. Beers et al., 2014; Eidt et al., 2020). The second is a governance-oriented conceptualisation, focused on actor strategies and capacity to transform institutions (e.g. Mahon et al., 2010; Osei-Amponsah et al., 2018). The third is a socio-political and socio-material conceptualisation, emphasising material aspects of power (e.g. Cullen et al., 2014) and how actors mobilise resources to exercise power, such as how legitimacy of knowledge is created (Csurgó et al., 2008; Fuchs and Glaab, 2011; Morgan and Murdoch, 2000). Our own analytical framework bridges elements of these three traditionally separate conceptualisations to explore how IP actors mobilise resources to strategically exercise power to surface and address conflicts of interest among regime and non-incumbent actors. Our analytical framework combines three perspectives: (i) power in transitions (Avelino and Rotmans, 2011), (ii) the transformative role of conflicts (Sørensen, 2014; Rossi et al., 2019), and (iii) actor role perceptions as an intermediary for changes in power relations (Avelino and Wittmayer, 2016; Sørensen, 2014).

2.1. Power relations

The power in transitions framework is an interdisciplinary framework for studying power dynamics among actors with stable roles,
relationships and practices in the incumbent regime, and actors seeking to change these roles, relationships and practices. Two aspects of this framework make it suitable for addressing our research aim. Firstly, it encapsulates several concepts previously applied to studies of power in IPs (Cullen et al., 2014; Koch, 2004; Swaans et al., 2013; Swan and Scarcrough, 2005). For example, Cullen et al. (2014) used the power cube (Gaventa, 2006) to analyse where and how power is manifest from local to global levels in IPs for natural resource management. Swan and Scarcrough (2005) used Hardy’s (1996) three dimensions of power to study the politics of networked innovation in European businesses. Other authors (e.g., Akullo et al., 2018; Osei-Amponsah et al., 2018; Swaans et al., 2013) use institutional perspectives (e.g., North, 1990) to analyse the presence and influence of differing interests among actors in IPs for smallholder development. Our analytical framework brings together these separate concepts of power. Secondly, by unpacking the resources used by actors to exercise power, the framework supports an exploration of how actors use power to stage (or hide) conflicts of interest to change (or maintain) role perceptions and power relations (Blesh and Wolf, 2014; Hinrichs, 2014). We therefore view power as a “force that affects outcomes” (Hardy, 1996, p. S3), rather than a force to exert over others, as has been recommended by previous studies of power dynamics in IPs in diverse settings (e.g., Mahon et al., 2010; Swaans et al., 2013; Swan and Scarcrough, 2005). In the power in transitions framework, power is defined as the capacity of actors to mobilise resources to achieve individual and/or collective goals (Avelino and Rotmans, 2011). For example, ‘invisible forms of power’ (Gaventa, 2006) used by smallholder farmers to resist innovations through feigned interest, pretending to comply or sabotaging trials (Cullen et al., 2014) or by rural advisors in Ireland to circumvent the top-down imposition of participatory extension (Mahon et al., 2010). This enables us to consider how platform actors may individually and collectively use power to create (or resist) change in the existing system.

Differences among actors in their capacity to mobilise resources, including creating new resources (Table 1), result in different power relations. Earlier studies of power relations in IPs have tended to miss the ‘invisible forms of power’ exercised by mobilising natural and artificial resources (Cullen et al., 2014) by emphasising mobilisation of monetary (c.f. Cullen et al., 2014) or mental resources (particularly knowledge) (e.g., Czurgó et al. (2008) in the context of sustainable development in rural Europe, and Morgan and Murdoch (2000) for organic and conventional agriculture value chain actors in Europe).

The capacity of actors to mobilise resources to exercise power results in the directionality of power relations. Examples of the ‘directionality of power’ include: i) an actor exerting power over another, thereby creating a one-sided dependency, e.g. when farmers are viewed by other IP members as ‘implementers’ rather than co-designers (Cullen et al., 2014; Eidt et al., 2020); or ii) several actors exerting power over each other to create antagonism, e.g. when farmers sabotage trials on their farm because the technology trialled does not align with their interests (Cullen et al., 2014). This depends on the extent to which one actor has power over another and the power relation that exists (Table 2). The typology of power relations from Avelino and Rotmans (2011) recognises that perspectives of power over, power with and power to, are not mutually exclusive, but are dynamic and can occur in combination (El Bilali et al., 2018).

<table>
<thead>
<tr>
<th>Resource type</th>
<th>What is mobilised</th>
</tr>
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<tbody>
<tr>
<td>Mental</td>
<td>Information, concepts, ideas, beliefs</td>
</tr>
<tr>
<td>Human</td>
<td>Personnel, members, voters</td>
</tr>
<tr>
<td>Artificial</td>
<td>Apparatuses, products, construction, infrastructure, art</td>
</tr>
<tr>
<td>Natural</td>
<td>Raw materials, physical space, time, organic life</td>
</tr>
<tr>
<td>Monetary</td>
<td>Funds, cash, capital</td>
</tr>
</tbody>
</table>

When actors come together in IPs they do so with individual goals that may or may not comprehensively align with an emerging collective goal (Swan and Scarbrough, 2005; Zadeck et al., 2008), as was observed by Osei-Amponsah et al. (2018) for the case of differing donor and NGO goals in two IPs in Ghana. Actors also have different capacities for exercising power to influence how individual and collective interests are aligned (Eidt et al., 2020; Schut et al., 2016; Swaans et al., 2013). For example, Cullen et al. (2014) observed that three research-for-development platforms established in the Ethiopian highlands had goals and platform membership set by the organising Government agency prior to participation of local farmers. The typologies of resources and power relations are therefore useful to explore the ways power relations influence the staging of conflicts of interest among platform actors.

2.2. Staging conflicts of interest and changing role perceptions

Conflicts of interest arise when actors realise competing benefits from adjusting their actions. Such conflicts can be transformative when actors’ experience a change in their role perceptions (Sørensen, 2014) to reconceptualize their relation to problems they perceive (Schmidt-Thomé and Måñysalo, 2013; Rossi et al., 2019). The extent that this staging occurs is influenced by actors’ mobilising resources to exercise power to challenge current role perceptions (Sørensen, 2014; Rossi et al., 2019). Role perceptions are the traditional images actors have of themselves and of each other in the incumbent regime (Sørensen, 2014). Aspects of the regime are reproduced by individuals in different roles, and these individuals may support the incumbent regime in some contexts, but want to change it in other contexts (Avelino and Wittmayer, 2016; Rossi et al., 2019). For example, farmers from different industries (livestock and cropping) may try to cooperate to increase productivity, but have opposing interests in the face of environmental issues (Piekel and Bardsley, 2015).

In summary, our analytical framework conceptualises the connection between IP power relations and role perceptions in the regime. We especially focus on the way actors mobilise resources to stage (or hide) conflicts of interest in the IP and how this transforms role perceptions and power relations (Fig. 1).

3. Case description and methods

This section describes the New Zealand agricultural system (incumbent regime), which is the focus for this study, and outlines the case study IPs addressing challenges facing the agricultural system.

3.1. New Zealand’s agricultural regime

New Zealand’s existing agricultural system reflects technological, organisational and institutional arrangements oriented predominantly towards modes of production that increase productivity while reducing farming’s impact on the environment. For example, the dairy industry’s productivity is viewed as needing to increase to “maintain and enhance the industry’s competitiveness” (Morris et al., 2006). In response, sector actors started pursuing competitive enterprises and industries in the global market (Le Heron and Roche, 1999). This has resulted in the intensification of agricultural production and cumulative negative impacts for surrounding environments, especially waterways (Myles et al., 2016). In this situation, the central government has sought to establish environmental regulations for land and water uses, including farming practices, such as the National Policy Statement – Freshwater Management (NPS-FM), which will set catchment-level limits on freshwater use and quality (New Zealand Ministry for the Environment, 2014).

3.2. Innovation platforms

The primary data for this study were collected from stakeholders participating in two New Zealand IPs addressing agricultural
production and sustainability challenges related to; (i) heifer rearing, and (ii) nutrient management (Rijswijk et al., 2015; Pinxterhuis et al., 2018). The first created a space for industry organisations and farmers to interact and negotiate efficient ways to mobilise resources and skills to increase the live weight of dairy heifers. The second brought together cropping, sheep, beef and dairy farmers, industry organisations and a regional council (Environment Canterbury; local government responsible primarily for regional environmental regulation) to support farmers to meet future environmental regulations by reducing nitrate leaching.

Both platforms were initiated from the regime, and while their transformative ambitions were not as great as those documented in studies on sustainability transitions (Diaz et al., 2013; Hermans et al., 2016; Ingram, 2015; Lamine, 2011), the IPs did aim to alter the incumbent regime (Srinivasan et al., 2019).

### 3.2.1. Heifer rearing

In 2013, the heifer rearing project was initiated and funded by DairyNZ (an industry body that represents all dairy farmers in New Zealand and can levy these farmers to undertake industry-good activities). This project was developed in response to industry data indicating that 73 per cent of heifers entering the national herd were at least 5 per cent below target weight (McNaughton and Lopdell, 2012). This represented an estimated national loss of NZD120 million per annum in farm profit across the dairy industry (Brazendale and Dirks, 2014), through decreased milk production and increased animal rearing costs. Many heifers are reared off-farm by a third party (for example a grazier who runs a business rearing young dairy animals), often on more marginal land (Brazendale and Dirks, 2014). Graziers may take young dairy stock to provide additional income to their sheep and beef farming enterprise or as specialist heifer graziers. The other main groups involved in the project were Beef and Lamb NZ (another industry-good body), the Livestock Improvement Corporation (LIC, a dairy farmer-owned co-operative providing genetics expertise, information and technology to the dairy sector), grazing companies, dairy farmers and graziers. This IP worked on the strategy for the heifer rearing industry, with a focus on resource development, relationship management between interested parties, and development of an alternative model for pricing heifer rearing.

### 3.2.2. Nutrient management

The nutrient management IP brought together several initiatives. In 2012 Environment Canterbury, which is directed by the NPS-FM to establish limits for freshwater quality, set up a project to inform nutrient management processes and assess compliance of agricultural practices in the Canterbury region: the Matrix of Good Management (MGM). In this platform, Environment Canterbury worked with industry organisations and businesses (DairyNZ, the Foundation for Arable Research, Beef and Lamb NZ, the fertiliser industry, the seed industry and processors). Environment Canterbury also worked with five research organisations to identify farm practices to reduce nitrate leaching. Another initiative in the platform was Forages for Reduced Nitrate Leaching (FRNL), begun in 2013. DairyNZ-led FRNL sought to develop practical options for farmers in the arable, sheep, beef, and dairy industries to reduce nitrate leaching by 20 per cent by 2020.

### 3.3. Data collection and analysis

For each case study purposive semi-structured interviews with farmers, researchers, and individuals from industry and a regional council involved with the IPs were undertaken between April 2015 and July 2015, in accordance with previous work utilising the case study method (Ingram, 2008). This was not the first interaction with the IPs. Previous engagement included workshops and benchmarking interviews to build an initial understanding of power dynamics in each case. Eight individuals from the heifer rearing IP and ten from the nutrient management IP participated in the interviews (Table 3). Two interviewers separately undertook the interviews. Each interview took between one and 2 h. All the participants were asked the same interview questions. The questions explored their perceptions of actor interactions in the project, understanding of individual actor (and overall project) interests and goals, conflict among actors, and changes in role

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**Table 2**

Typology of power relations. Source: Avelino and Rotmans (2011).

<table>
<thead>
<tr>
<th>Power relation type</th>
<th>Manifestation of power relations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power ‘over’</td>
<td>Mutual dependency – A has power over B but B also has power over A</td>
</tr>
<tr>
<td>‘More/less’ power</td>
<td>Cooperation – A exercises more power than B, but A and B have similar collective goals</td>
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<tr>
<td>‘Different’ power</td>
<td>Synergy – A’s and B’s different power enable and support one another</td>
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<td></td>
<td>One-sided dependency – A has power over B but B does not have power over A</td>
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<tr>
<td></td>
<td>Competition – A exercises more power than B, while A and B have mutually exclusive goals</td>
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<tr>
<td></td>
<td>Antagonism – A’s and B’s different power restrict, resist or disrupt one another</td>
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<tr>
<td></td>
<td>Independence – A and B have no power over each other</td>
</tr>
<tr>
<td></td>
<td>Co-existence – A exercises more power than B, A and B have independent co-existent goals</td>
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<tr>
<td></td>
<td>Neutrality – A’s and B’s different power do not (significantly) affect one another</td>
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Fig. 1. Relationship between staging conflicts of interest and changes in actor role perceptions and power relations in the incumbent regime.
perception. Each interviewee is referred to by their code in Table 3, particularly when direct quotes are used.

The interviews were recorded and transcribed, provided to interviewees who had requested a copy of the transcript for review, and then coded by the second and third authors for analysis using the analytical framework as the coding structure (Tables 1 and 2, and Fig. 1). The second author conducted thematic analysis of the coded interviews (Merriam, 2009) to identify recurring themes across interviewees and explored links among these themes.

4. Findings

4.1. Heifer rearing

There were two groups of individuals identified in the heifer rearing project; (i) dairy farmers and graziers, and (ii) organisational representatives from the industry bodies (DairyNZ and Beef + Lamb NZ) and commercial agricultural companies (LIC, grazing companies) in the sector. Commercial companies had priorities to protect commercially sensitive information and their on-going business interests, while industry-good bodies had a responsibility to make the most of resources to support farmers. From an industry-good body perspective, HR3 stated that some organisational representatives would not stay in the project if the project did not serve their organisational priorities. From HR6’s perspective of a commercial company, the situation was that “things were said and indicated that because we were ‘commercial’ our view was somehow less valid.” These observations illustrate how different organisational priorities resulted in antagonistic power relations (Table 2), as illustrated by the following quote by a private consultant in the project (HR8):

“In this project we have DairyNZ which is an industry-good organisation that doesn’t have any commercial imperatives directly. Then you have LIC who do have some public good stuff but they also have very high profit, they have to make money to exist … so all these people have different goals and business motives.”

Therefore, even though the organisations involved in the project had a common vision of increasing the number of heifers reaching target weights, and could agree on some of the tools to enable this goal, issues regarding resourcing could not be resolved.

4.1.1. Power relations

At the start of the project dairy farmers wanted heifers with greater live weights for improved reproductive performance, while graziers wanted to make a living and produce healthy animals. At this time demand for heifer grazing outstripped supply as there was a shortage of land for grazing heifers. A dairy farmer (HR4) explained how this characterised power relations between dairy farmers and graziers:

“They [dairy farmers] don’t want to turn round and upset the grazier because he might say well there’s 10 other guys willing to come in here and be happy with me, so why should I change. So it is hard to try to get everyone to adapt to the same level.”

Graziers were therefore perceived as having one-sided power over dairy farmers (Table 2) as they were able to negotiate the contract conditions for rearing heifers. This was compounded by dairy farmers and graziers rarely discussing weight gain targets or formalising agreed targets in the contracts.

An industry body representative (HR1) explicitly recognised the power relations between industry-good bodies (DairyNZ and Beef + Lamb NZ) and commercial agricultural companies (LIC, grazing companies) in the sector. Commercial companies had priorities to protect commercially sensitive information and their on-going business interests, while industry-good bodies had a responsibility to make the most of resources to support farmers. From an industry-good body perspective, HR3 stated that some organisational representatives would not stay in the project if the project did not serve their organisational priorities. From HR6’s perspective of a commercial company, the situation was that “things were said and indicated that because we were ‘commercial’ our view was somehow less valid.” These observations illustrate how different organisational priorities resulted in antagonistic power relations (Table 2), as illustrated by the following quote by a private consultant in the project (HR8):

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<table>
<thead>
<tr>
<th>Table 3 Interview participants in the heifer rearing (HR) and nutrient management (NM) cases.</th>
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<tbody>
<tr>
<td>Code</td>
</tr>
<tr>
<td>HR1</td>
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<td>HR2</td>
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<td>NM10</td>
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Fig. 2. Changing power relations and role perceptions among graziers and dairy farmers.
4.1.2. Conflicts

As part of their involvement in the IP, dairy farmers and graziers began to create mechanisms to support dairy farmer and graziuer agreement on heifer live weights targets. This involved conflicts of interest between them. Both dairy (HR4) and sheep and beef (HR5) farmers acknowledged the role of conflicts to tease out the best outcome. A facilitator played an important role in making conflicts explicit enough that dairy and sheep and beef farmers could cooperate, agree on a process for setting weight targets, and develop similar terminology.

In contrast, the existing conflicts among the industry organisation representatives were not staged, as illustrated by an agricultural company participant (HR6):

"We get better if we can all innovate and do our things and as long as we're all on the same page and we're not conflicting and we're helping lift performance nationwide, then that's a good thing and none of us should be held back by the other partners in the process."

This suggests that the agricultural companies and industry-good bodies can pursue different priorities while sharing an overarching goal. At the same time, HR6 expressed that this attitude towards cooperation can be perceived as competitive by others in the IP.

4.1.3. Role perceptions

The different experiences of staging conflict between dairy farmers and graziers, and among industry-good and commercial organisations, is reflected in how individuals experienced changes in role perceptions. There was a new role perception shared by dairy farmers and graziers. In staging conflicts, the IP was experienced as "a new space" (HR4) and "a blank page" (HR5) in which dairy farmers and graziers realised their synergistic power relations (Table 2).

In terms of the industry organisations, an agricultural company representative (HR7) provided a contrasting example:

"It is a result of perhaps unclear expectations of the role and unrealistic timeframes, short term versus medium term. And perhaps issues about leadership and who is leading here and who's reporting to who and who gets to go to what meetings, do they have any speaking rights?"

Other examples also revealed how power relations between industry-good bodies, and commercial companies influenced the way these organisations mobilised resources. For example, DairyNZ had the mandate and funding to lead the project, while some organisations had information for commercial use. The group of dairy farmers and graziers expected that industry organisations would cooperate to make the most of these resources by changing the resource distribution to reduce overlaps. However, individuals from the industry organisations maintained their existing role perceptions, and power relations among organisational representatives remained antagonistic.

4.2. Nutrient management

Observations from the nutrient management case illustrate that power relations between the environmental regulator (Regional Council) and sector stakeholders (industry-bodies) changed after they staged out existing conflicts (Fig. 4), while conflicts among groups to be regulated (industry-bodies and farmers from different agricultural sectors) were not staged out, resulting in no change in role perceptions or power relations (Fig. 5).

4.2.1. Power relations

The initial role of the Regional Council as implementer of environmental regulations contributed to a lack of negotiation regarding how the Regional Council would use data in environmental regulation design. This data had been collected by industry-bodies to support farmer decision-making to increase farm productivity. Industry-bodies also experienced Regional Council power over them in setting timeframes for meeting environmental regulations and the use of science data for setting policy to regulate on-farm environmental activities. From an industry perspective, an agricultural company representative (NM8) expressed that the national and regional regulators mobilised their mandate to implement policies and use of science data for policy setting:

"The Regional Councils have determined that there's a number in there that we have to meet or not exceed and all of a sudden this tool which we've been able to use as a guide or an indication of the trend now has become a black and white number and it was never developed for that."

4.2.2. Conflicts

The one-sided power relations between the Regional Council and industry stakeholders shifted from one-sided to mutual dependency when the industry stakeholders gained new science data that the Regional Council did not have, but needed. An industry-body representative (NM1) explained this process:

"They [people in the regional council] kept the MGM project quite separate from policy they said 'you produce a matrix, a table and the
numbers and we can decide what we do with it’ and we kept pushing back saying ‘okay now we’re interested in those numbers as well we’re working on that but we don’t know if we want to give it to you because we don’t know what you’re going to do with it’. So finally they gave in and they’ve now got a policy working group where they’ve got several people from Environment Canterbury across all their sections like the consenting process, planning people involved in that group and people from industries.”

Having this science data increased the power of sector stakeholders in the regulatory process to stage out conflicts and negotiate how farm-level science data was used in environmental regulation and the timeframes for implementing regulations.

From the perspective of the Regional Council, NM6 explained the difficult position to mediate the tension between national policies and the agricultural sector regarding environmental issues:

“The requirement to maintain or improve and to set limits is constrained by the regional and national conversation or the outputs from that conversation.”

In response to this situation, the Regional Council sought to amend “an incredibly unrealistic timeframe for delivery” (NM6) set in national policy. To do this the Regional Council mobilised their resources, such as influential employees, to negotiate timeframes with national regulators. In this way the Regional Council mediated the relationship between national policy and regional sector stakeholder interests.

Another conflict in the IP was among industry-bodies and research organisations competing over who receives attribution for assisting farmers. In addition to this tension there were conflicts around the direction of the project and levels of commitment expected of each other. Furthermore, dairy, sheep and beef farming sectors experienced conflicts over who contributed most to environmental issues, as a regional council representative (NM6) explained:

“Dairy farmers tend to have the same soil type, uniform farming system across the platform. Whereas on a sheep and beef farm they are growing all sorts of crops. That paddock had fattening lambs on a few weeks ago and you now grow potatoes on it. So it’s much harder for them to see what good management practice would look like in that context.”

While these conflicts among agricultural sectors existed in the project, an industry body representative (NM1) stressed the fact that the new programme, FRNL, which was led by DairyNZ and funded by the government enhanced the sense of collaboration among individuals in the project. In a way, the group of sector stakeholders mobilised their
monetary, artifactual and mental resources to enhance their capacity to stage out conflicts with the Regional Council.

4.2.3. Role perceptions

Role perceptions of individuals in the project, such as environmental regulators and the ones to be regulated, changed through staging conflicts. The Regional Council developed a perception of their role as an intermediary between national regulators and sector stakeholders. This suggests the changes in power relations through mobilising resources and staging of conflicts between regulators and sector stakeholders can change role perceptions of regulators.

A research organisation representative (NM10) indicates that farmers share a similar sense of collaboration while dealing with tensions among, arable, sheep and beef, and dairy sectors:

“The arable sector, the beef and lamb sector and the dairy sector are working together and there is some alliance. However as soon as there is a bit of stress they tend to go run back to what is comfortable. But they are seeing the benefits of that working together so I think it’s a healthy thing and part of the process.”

This conflict was not staged and shared role perceptions in relation to dealing with the environmental issues did not emerge among the agricultural sectors involved in the project.

5. Discussion

The aim of this paper was to understand how power relations in the incumbent agricultural regime may manifest as conflicts of interest among actors in IPs, and how the staging of these conflicts can transform actor role perceptions and power relations. To address this aim we sought to answer three questions:

1. How do power relations among actors in the existing agricultural system (incumbent regime) manifest in conflicts among IP actors?
2. How do platform actors mobilise resources to stage (or hide) conflicts?
3. How does staging conflicts of interest in IPs influence the formation of new role perceptions and power relations among actors in the agricultural system?

Overall, our findings suggest gradual staging of conflicts in IPs can transform role perceptions and power relations among actors in the incumbent system. Existing power relations in the incumbent system and the mobilisation of resources can be used by platform actors to actively stage (or hide) these conflicts to either change (or maintain) role perceptions and power relations in the regime.

To answer our first question, the cases demonstrate that power relations among actors in the regime can, in one context, manifest as conflicts of interest among IP actors, while in another context these power relations did not manifest in conflicts. For example, industry organisations mobilised resources to maintain existing power relations and continue to compete in addressing heifer rearing productivity. However, in nutrient management, industry organisation representatives mobilised different resources such as funding for the project and commercial information, to exercise power over each other to protect their own interests. These findings highlight previous authors’ (Cullen et al., 2014; Avelino and Rotmans, 2011; Avelino and Wittmayer, 2016; Rossi et al., 2019) calls for the need to conceptualise power relations in IPs as dynamic and a force shaping outcomes rather than solely a force exerted over others.

In answer to our third question, both IPs provided a potential space to gradually stage conflicts of interest that exist in the regime. However, a barrier to changing the regime occurred when actors used existing power relations and mobilised resources to maintain existing role perceptions. For actors that staged conflicts their role perceptions changed. In heifer rearing, dairy farmers and graziers staging conflicts led to new shared role perceptions to coordinate increasing dairy heifer live weights. Our cases therefore support Avelino and Wittmayer (2016) and Sørensen (2014) by demonstrating that staging conflicts can transform actors’ role perceptions leading to new innovation pathways.

We next discuss some theoretical and practical implications of our findings, which provide new insights regarding the role of IP actor composition and power relations in stimulating change in the incumbent agricultural regime.

5.1. Implications for innovation platform theory

Previous research on IPs (e.g. Eidt et al., 2020; Cullen et al., 2014; Esparcia, 2014; Nederlof et al., 2011) has tended to conceptualise power as residing in the external institutional environment and as an inhibitor to the change ambitions of IP actors. Under this conceptualisation a suggested solution to addressing power is the equal participation, negotiation, and agreement among IP actors. This may, however, mask power relations in an illusion of participation (Cullen et al., 2014; Rossi et al., 2019). To respond to this some (e.g., Cullen et al., 2014; Swaans et al., 2013; Totin et al., 2018) have highlighted the need to recognise how incumbent actors, through setting platform membership and agendas, their own participation (or not) in platforms, reduce IP potential to transform the regime. A priori identification of potential conflicts using methods such as those cited by Hermans (2008), Ditzler et al. (2018) and Thiel et al. (2015) can help to unmask power relations when forming IPs. Others (e.g., Beers et al., 2014; Klerkx et al., 2010; Totin et al., 2018) have highlighted the need for IP actors to continuously assess their institutional environment and reinterpret their activities. Innovation brokerage and reflexive monitoring may provide some foundations on which to build practice that is more cognisant of power relations, can respond to power residing in the regime, and contest or work around it.

In contrast our cases show that including incumbent actors in IPs has the potential to make power relations in the regime more apparent, thus responding to Cullen et al.’s (2014) call to make power relations visible in IPs. By including incumbent actors, IPs can potentially reveal power relations between local and higher-levels, including structural challenges that cause conflict (thus laying the groundwork for institutional change). Therefore, like Ingram (2015) and Rossi et al. (2019), our cases show that inclusion of incumbent actors in IPs has potential to stimulate change in the agricultural regime, though at the same time potentially maintaining existing power relations. Therefore, making
power relations visible may be insufficient to stimulate more transformative change in the regime and lead to what has been referred to as a ‘fit and conform’ strategy as opposed to a ‘stretch and transform’ strategy in terms of changing incumbents’ power (Hermans et al., 2016; Smith and Raven, 2012). In both of our cases resources were mobilised by incumbents to hide conflicts of interest and thus maintain existing power relations and role perceptions.

A novel insight from our cases is the opportunity for platform actors perceived as less powerful (c.f. Kukk et al., 2016) to mobilise resources (including non-financial) to stage conflicts that address existing power relations and open other pathways to change in the regime. For example, industry organisations in the nutrient management case mobilising scientific data they held to change process time frames set by the Regional Council. Therefore, when conflicts in IPs are staged, rather than hidden, they can be used to stimulate change. Rather than create spaces and events where conflicts can be resolved (e.g. Akullo et al., 2018; Kilelu et al., 2013), our cases suggest staging conflicts can play an active role in transforming role perceptions. In this respect, our findings are more in line with Hoffman and Loebor (2016) on conflict in transitions, who argue that conflicts can stimulate creativity.

Our cases demonstrate that this change in role perceptions requires platform actors to mobilise resources to stage conflicts of interest, rather than incumbent actors using existing power relations in the regime to hide conflicts. As has previously been observed, incumbent actors may mobilise resources to actively create conflicts of interest to change the regime (Kukk et al., 2016) or prevent these conflicts to maintain existing power relations (Smink et al., 2015; Pel, 2016; Späth et al., 2016).

5.2. Implications for innovation platform practice

In terms of the implications for IP practice, the question is how to facilitate actor interactions so that the inclusion of incumbent actors supports the staging of conflicts of interest to form new role perceptions and power relations, rather than to reinforce or magnify existing power relations? Incumbents (as in the case of Kukk et al. (2016)) or non-incumbents seeking change in the regime can mobilise (or create) resources in an IP to stage conflicts and transform role perceptions. For example, sector stakeholders in the nutrient management IP mobilised the use of scientific data they owned. Those facilitating IP interaction must be open to situations where incumbents mobilise resources to hide conflicts. For example, industry organisations in the heifer rearing IP. The analytical framework presented in this paper can provide a structure to help platform facilitators to reflect on power dynamics among platform actors and the strategies used to prevent staging of conflicts (e.g., Smink et al., 2015; Pel, 2016; Späth et al., 2016). This is needed to avoid innovation pathway capture by incumbents (Späth et al., 2016).

Our findings thus go beyond the call for including spaces for negotiation in IPs (Akullo et al., 2018), by demonstrating a useful analytical framework for understanding how existing power relations and the mobilisation of resources contribute to staging (or hiding) conflicts among platform actors. Complementing the power in transitions framework with perspectives on conflicts and role perceptions as they emerge can help to observe how actors interact with the regime by exercising different types of power and mobilising resources to stage (or hide) conflicts. Similar to Rossi et al.’s (2019) highlighting the need to create what they call ‘enabling relational environments’, this enables an understanding of how exercising power and mobilising resources in IPs may or may not result in staging conflicts and changing role perceptions. Of critical importance is recognising that the same actors may exercise power to change role perceptions in one context, while seeking to maintain existing roles and power relations in other contexts. Hence, this denotes a power mobilisation ambiguity where incumbents may be both change agents as well as maintainers of the status quo (Späth et al., 2016). This has previously been observed by Fielke and Bardsley (2015) who refer to different interests of the same actor groups in different contexts (e.g., farmers in different regions of Australia) or different actor groups in the same context (e.g., farmers and consumers ambivalence toward animal welfare). As in our cases the same actor groups bring different interests (and resources) to IPs in different contexts.

 Actors have particular role perceptions, exercise different types of power, and form different groups in IPs. Together these contribute to the characteristics of power dynamics. For actors, detailed understanding of how they and others exercise power enhances the capacity of IPs to deal with evolving relations not only as face-to-face power struggles between individuals but also power relations that actors face in their interactions with the regime. Practical methods for revealing and reconfiguring power relations are difficult to apply in practice because power is often hidden. Nonetheless, a range of tools for facilitators (e.g. van Mierlo et al., 2010) could expose and interrogate power relationships in IPs as they emerge. However, the outcomes may be affected if the forces that hold the existing system stable are stronger than the desire for change. In short, further understanding of stabilising forces and disrupting forces are needed.

6. Conclusion

This paper conceptualised conflicts in IPs as manifestations of power relations in the wider incumbent regime. The experiences in the two cases provide examples to illustrate how actors, as part of the agricultural regime, mobilise resources to reinforce or change their power relations and role perceptions through changing or mitigating conflicts. Our cases demonstrated that IPs can become a space for making explicit power relations and conflicts of interest that exist in the regime. When facilitators of IPs more actively use staging as a way to make conflicts of interest and power relations visible IP actors could successfully transform role perceptions and re-interpret their context in ways that can open up new innovation and transition pathways.

A main implication for IP theory is the need to move the conceptualisation of power from a force exerted by actors in the incumbent regime over IP actors to power relations in IPs as context specific, dynamic and a force shaping outcomes. An implication for IP practice is the importance of recognising that power relations in the regime appear differently in specific contexts and that conflicts may need to be staged to unpack power relations and role perceptions in these different contexts.

There is a tension between IPs as maintaining and changing agricultural regimes, with struggles amongst actors, between actors and their organisations, and between the safe space of the IP and the organisational environments individuals come from. Given this tension IPs should not be seen as universally leading to regime transformation. Our analytical framework is useful for actors to better understand the nature of power relations, conflicts and role perceptions so that platform actors may enhance the potential to collectively influence the agricultural regime through changes in power relations and role perceptions.
CRediT authorship contribution statement

J.A. Turner: Conceptualization, Methodology, Writing - original draft, Writing - review & editing, Visualization, Supervision, Project administration, Funding acquisition. A. Horita: Conceptualization, Methodology, Formal analysis, Writing - original draft, Visualization. S. Fielke: Conceptualization, Methodology, Writing - original draft, Writing - review & editing. L. Klerks: Conceptualization, Writing - original draft, Writing - review & editing, Funding acquisition. P. Blackett: Conceptualization, Methodology, Investigation, Writing - review & editing. D. Bewsell: Investigation, Writing - review & editing.

B. Small: Investigation, Writing - review & editing. W.M. Boyce: Writing - original draft.

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