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Would you like some fries with your ecosystem services?: McDonaldization and conservation in Prince Edward Island, Canada

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ABSTRACT

In response to widespread soil erosion, biodiversity loss, and rapid social and ecological homogenization of agri-environmental landscapes, economic incentives such as payments for ecosystem services (PES) are presented by natural resource managers as the most efficient way to address the unintended consequences of intensive agriculture. In this article, we explore the consequences of rationalizing conservation by adopting sociologist George Ritzer's "McDonaldization" thesis to contextualize on-farm conservation payments to farmers on Prince Edward Island (PEI), Canada. McDonaldization refers to the rendering of both society and nature in increasingly calculable, predictable, efficient and controllable ways. Through the introduction of economic incentives for conservation in the context of increasing pressures to maximise yields of processed potatoes in PEI, we discuss how debates on designing conservation payments are framed in terms of optimizing efficiency and maintaining predictability. In some cases, conservation is viewed as generating new productive values from agricultural landscapes, including for values of "care" "community" and "resilience," that can be commodified for profit. We emphasize how intensifying agriculture necessitates economically beneficial conservation practices to both pre-empt future production losses and to reproduce the conditions necessary for optimizing future production. Within this arrangement of disciplining unexpected outcomes with ever-uniform, predictable, and controllable responses, we conclude that dynamic spontaneity of unexpected social and ecological responses and the politicization of farmer autonomy may avoid the tendency towards reinforcing business-as-usual agricultural production.

1. Introduction

As industrialized agricultural practices have continued to pollute waterways and degrade biodiverse habitats, novel approaches have emerged to manage these negative "externalities" in the most economically efficient way possible (Ferraro and Kiss, 2002). Agri-environment schemes are an increasingly popular means to promote conservation by economically incentivizing landowners to adopt specific land-use practices deemed to curtail soil loss, enhance on-farm biodiversity, minimize water pollution, or offer sinks for carbon sequestration (Potter and Wolf, 2014). Agri-environment schemes often function as government-driven subsidies (e.g. Mettepenningen et al., 2011) or as more creative market-based trades in water quality, carbon credits, or biodiversity offsets on agricultural landscapes. Such schemes involve significant institutional and financial support from the government (Muradian et al., 2013). "Payments for ecosystem services" (PES) is one such scheme that frames subsidies for conservation as agreements between voluntarily transacting parties, in which payment is conditional upon a particular land-use activity taking place (e.g. Wunder, 2015). The most common interpretation of PES adopts an economistic understanding of incentive-based transaction in which payments are made efficient by being conditional to a service delivered (e.g. as a land-use change or as measurable improvements to socially-defined ecosystem services).

One risk of making conservation more efficient, as PES attempts to do, is to treat conservation as a quick-fix technical problem that does not fundamentally alter a growth-oriented development trajectory (Li, 2007). In the process, alternative human-nature relations that might problematize the systemic roots of ecological degradation and identify the means to address them are either ignored or at worst suppressed

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(Fletcher and Büscher, 2017). It is therefore our intention to understand how a turn towards conservation efficiency conveniently aligns to broader efforts at rationalizing productive landscapes. By 'rationalizing' we refer not only to the leveraging of technological and impartial scientific knowledge to justify what counts as "progress," but more fundamentally to furthering the strategic interests and power of a worldview, which equates "progress" with extraction, growth, and profit-orientation (von Werlhof, 2013). In this article, we explore the consequences of rationalizing conservation within a relentless quest for growth by adopting sociologist George Ritzer's "McDonaldization" thesis (1996).

In an agricultural context, McDonaldization logic refers to a socially transformative process of landscape simplification (Morris and Reed, 2006). It takes place through a cascading series of rationalizing techniques that continuously respond to the unexpected social and ecological consequences of each previous attempt to structure landscapes in specific ways. This never-ending cascade of rationalization reflects the application of a singular organizing principle in responding to socio-ecological conflicts. Precision agriculture, for example, aims to optimize yields while minimizing nutrient inputs and thus ecological impacts. However, computerized techniques to improve efficiencies also result in faster and better yielding production. In a sort of Jevons paradox of "sustainable" agricultural intensification, a new baseline for production quotas is set, ultimately neutralizing any efficiency gains (Ceddia et al., 2013). McDonaldization is based on the assumption that technology and market logic will invariably "solve" any problem if they are sufficiently sophisticated and targeted enough to internalize social and ecological difference into the sameness of production (Castree, 2009).

The preoccupation around ecosystem services exemplifies this cascading tendency of rationalizing social and ecological externalities into production logic. Rather than examining land-based social relations, mainstream environmental economists have been more interested in classifying new extractable benefits from the land that extend beyond traditional crop production to paying for ecosystem services. In particular, they seek to avoid the messiness of social relations in favour of easily measured "things" like conditionality. This refers to the provision of evidence that the ecosystem service or the desired land-use change "paid for" was achieved or enacted (Wunder, 2015; Borras and Franco, 2011). Much less analysis has centred on the strategic role PES plays within the political economy of commodity production, including by sustaining the social and ecological relationships necessary to further intensify commodity production.

This study contributes to critical scholarship on PES by going beyond whether the tool is achieving its narrowly defined conditionality requirements. Instead, it examines how PES is contextualized within the culturally-hegemonic patterns of industrial agricultural landscapes, and the ways farmers respond to PES given this context. As has been illustrated by Kolinjivadi et al. (2019), the substantial political and economic influence of industrial agriculture poses important trade-offs between attaining ever-expanding yield contracts in perpetuity and sustaining the soil substrate and soil biodiversity as foundations of continued production. This article builds on the authors' arguments by adopting a broader discursive approach to the historical phenomena at play that explain how PES inserts itself into the political economy of intensive potato production.

We illustrate how the McDonaldization thesis applies to on-farm conservation payments to farmers on Prince Edward Island, Canada (henceforth PEI). PEI offers an illustrative example of a highly capital-intensive agricultural economy under pressure for both increased agricultural production, especially for processed potato products, and demands for conservation, particularly for a bourgeoning tourism industry. We argue that conservation becomes a productive regime in itself, serving not only to expand the portfolio of ecological goods and services emergent from intensive agricultural landscapes, but also as a way to justify the continued existence and expansion of intensive agricultural production. We imply a *double entendre* to the term McDonaldization since the majority of processed potato products (e.g. French fries) on PEI are enjoyed by consumers of fast-food restaurants around the world, including the McDonalds fast-food chain.

In order for McDonaldization to take place, plural values around human-nature relations are required as a sort of fodder for the logics of efficiency, calculability, predictability, and control to operate upon, rendering these values homogenous and technical. Yet, as we later describe, this logic invariably fails as unruly natures are inevitable outcomes in any attempt to discipline the world. It is our claim that such undisciplinable natures are themselves acts of political resistance and hold the key for transforming relationships between farmers and the land away from the deadening logics of commodification and profit. As one farmer on PEI that we interviewed stated:

> *You can't farm without caring for the land. They go hand-in-hand, like living and breathing. I am here to farm. If I wanted to just make money, I should have quit farming long time ago."* (Prince County)

In Section 2, a theoretical overview of the McDonaldization thesis is presented as it pertains to the historical and geographic trend of reproducing homogenized and predictable agricultural landscapes. Section 3 describes how this process has historically unfolded on PEI. Section 4 illustrates this process, exploring the process of PES implementation on PEI in the context of industrial french-fry production while drawing upon insights from semi-structured interviews with actors involved in the PES program. Section 5 contextualizes perceptions from farmers and program managers to show how economic incentives attempt to rationalize conservation as a technical and apolitical fix while simultaneously rationalizing the need for conservation to reinforce status quo models of production. We also highlight how dependent relationships between farmers and the land generate alternative responses to resist against continuous rounds of rationalizing conservation. We conclude by calling for greater engagement with these "irrational" responses to intensive agriculture, including the politically mobilizing relationships of affect and reciprocity between farmers and the land to combat commodification.

2. McDonaldization and ecosystem services

2.1. McDonaldization as an organizational principle for production

George Ritzer's thesis of McDonaldization refers to a seemingly linear or smooth "process by which the principles of the fast food restaurant are coming to dominate more and more sectors of American society as well as the rest of the world" (2010: 263). Its logic strikes at the heart of a growth-based economy and pervades government, business, politics, education, and health (ibid). As Ritzer (2003) argues, McDonaldization involves deadening life into the submission of rationalized disciplinary order, in complete contrast to the unpredictability and spontaneity of life itself. This disciplinary order renders landscapes amenable for industrial production through enormous investments of both human and non-human labour (Adam, 1998). The specificity of this organizational discipline is characterized by two logics. The first is the logic of scalability, whereby the ultimate goal is to maximize profit of a particular commodity at lowest cost. The second logic refers to interchangeability, whereby any combination of human and non-human relationship can become a standardized input for commodity production (Tsing, 2015). Both logics occur across a presumably static spatial and temporal compass, with the aims of maximizing the efficiency of production (Castree, 2009).

The McDonaldization thesis has four key dimensions reflecting rationalization and systematic control in optimizing production (Morris and Reed, 2006). The first of these dimensions refers to the *efficiency* to produce the maximum amount of product or objective in the shortest time or cost possible. The second refers to *calculability*, referring to the capacity to quantify every aspect of the "product" delivered in terms of

indicators, including increasingly creative ways to represent quality through quantified metrics (Ritzer, 1996). The third dimension refers to *predictability*, in ensuring that product delivery or public policy is standardized and homogenized for consistency and cognitive buy-in. The fourth dimension is greater *control* through sunk costs in physical or social technology (e.g. rules or laws) that restrain or lock-out alternative possibilities for action.

2.2. Ecosystem services as the 'cheap nature' for production

Patterns of rationalizing agricultural landscapes depend fundamentally on conceiving human and non-human natures as resources (Li, 2014). For such natures to be conceptually converted into resources, an element of biophysical structure must first be disentangled from the socio-ecological relations of which it is part, resulting in the alienation of life-forms from their social and ecological settings (Tsing, 2016). Patel and Moore (2017) refer to this disentanglement as the 'cheapening' of nature to serve as inputs to capital production. Resources are therefore discursively "made" within a given social institution and through historical and ongoing hegemonies of political and economic relations before they can be valued, exchanged or traded. In this manner, production logics and conservation initiatives co-inform each other as different sides of the same dialectical coin. Conservation strategies become viewed as "solutions" to the irrationalities of simplified production systems, with the ultimate goal to render such systems more efficient. Ecosystem services offer an example of how this resource-making process emerges.

Ecosystem services, defined as benefits *to* humans *from* nature (emphases added) imply a linear flow of extractive potential premised on a fundamental separation of humans from nature (Kolinjivadi, 2019). In other words, the relationship between humans and non-humans takes the form of a spatially and temporally fixed "nature" "for humans" rather than one of dynamic co-production and co-realization rooted in complex and deeply situated relationships. The notion of "delivering" ecosystem services conditionally aligned to payments illustrates the disciplinary acumen of the McDonaldizing logic of calculability, predictability, control, and payment efficiency. It does so by making conditionality requirements more visible and attractive within the existing political economy of agricultural production. This ideal towards perfection or absolute predictability is what Ritzer (2010) refers to as "death": lacking the components associated with life, including instability, seduction, spontaneity, and ambivalence (ibid) (p. 128–129). Surely, the faster and more precise conditionality can be verified, the greater confidence there will be that desired land-use change or ecosystem service "delivery" has been achieved. Adherence to the discipline of "delivering" ecosystem services therefore reveals a striking contradiction between the pursuit of an industrial mode of production that is the root cause of ecological degradation, and the parallel production of a range of ecosystem services to mitigate the impacts of this very system (Hall, 1998).

McDonaldization logic rests on ceaselessly distilling or extracting the "optimal" from the sub-optimal. Such logic involves separating technical goals (e.g. conserving vegetated buffer zones around water courses) from the unexpected social, political, and ecological consequences of doing so (Myers et al., 2018). This is not to say that rationalizing attempts at conservation will not succeed in achieving particular objectives, like × tons of carbon sequestered or × hectares of habitat restored for pollinators. The concern is that these incremental benefits will instantly be overwhelmed by underlying pressures for intensive and expanding commodity production and multifunctional production systems. In such a context, novel strategies will continuously be devised to expand the commodity frontier, whether through harvesting of ecosystem services through carbon credits (Cavanagh and Benjaminsen., 2014; Cavanagh et al., 2015), or as we later describe, quantifying "lives influenced and touched" by conservation programmes.

3. The implementation of PES on Prince Edward Island (PEI)

3.1. Historical land-use practices

PEI is a mostly agricultural-based society, often monikered as a "million-acre farm" referring to its small size (with a total land area of nearly 600,000 ha) as Canada's smallest province and the important role that farming plays in the province's cultural, political, and economic affairs (France and Campbell, 2015). In addition to agriculture, shellfish aquaculture, recreational and commercial fisheries, and tourism are also main components of PEI's economy (Phelan, 1996). Land has always been an important source of struggle for Islanders. The ancestors of the Mi'kmaq First Nation have lived on what was called Abegweit for upwards of 12,000 years before encountering European traders (mostly French and Portuguese) at the end of the 17 century (MacDonald, 2019). It was the decisive victory of the British in 1758 that resulted in the immediate seizure of all land from the Mi'kmaq by the Crown, resulting in a significant loss of knowledge in land and water custodianship (ibid). During British colonization of PEI in the mid- 18th century, absentee landlords retained ownership of agricultural plots, depriving Island settlers to control the land they lived and worked on, while extracting land rents at higher rates. The legacy of the tenant struggles and resistance against perceived control by outside forces (e.g. the government) remains an important basis of solidarity in contemporary socio-ecological strategies. Support for sustaining healthy relationships with the land revolves around maintaining the cultural traditions of rural peasant communities on PEI and in combating ecological deterioration of the Island's highly erodible soils. (Phelan, 1996).

In 1969, the "Comprehensive Development Plan" was signed, building upon years of planning between the provincial government and the Canadian federal government under Pierre Elliot Trudeau. A major goal of this Plan involved the "consolidation, commercialization, and rationalization" of PEI farms (McFayland and Scott, 2019). PEI Premier, Alex Campbell, saw the Plan as a strategy for better access to external markets, enhancing the efficient utilization of the land, and improving mechanization for enhanced profits[1] (ibid). The Plan aimed to modernize and industrialize PEI's agriculture by rooting out economically "unviable" farms by denying credit to farmers and foreclosing on farmers' debt. This resulted in a transition from mixed farming towards specialization and eventually to the predominant cash crop of fresh, processed, and seed potatoes that form the core of PEI's agricultural exports today. As stated in the Plan: "The limiting factor on the rate of development will not be markets so much as the rate at which it proves possible to achieve the structural and social adjustments required to use the Island's agricultural resources more fully." (p. 1 of 1969 Development Plan, cited in Phelan, 1996).

It was at this critical historical juncture that the regularity of production yields merged with the efficiency logic of optimizing outputs from social (e.g. human) and natural (e.g. land resources) that characterize McDonaldization. This strategy became politically enforced and aligned to broader trends with the rise of agribusiness and industrialized production for greater reach in globalized market chains. The intensity of maximizing output as fast as possible created enormous impacts on the fertility and compaction of soils, quality of groundwater, chemical pollution of the air, biological diversity, increasing outbreaks of pests and the dismantling of social cohesion and cultural traditions on PEI (Randall et al., 2014). Agribusiness on PEI came to view the farmer as the "bottom rung supplier of cheap raw materials for

[1] Speaking to the Charlottetown Rotary Club (PEI) in 1973, six years after he initially praised the proposed Development Plan, Campbell criticized agricultural modernization as disconnecting and alienating people from each other and their environment, resulting in "an ecological, cultural, and personal wasteland." (McFayland and Scott, 2019).

industry." (Phelan, 1996: 94).

The mechanization model of production on PEI resulted in a series of tractor demonstrations and the blockading of roads on PEI in the early 1970 s led by both students and members of the National Farmers Union. The Royal Canadian Mounted Police, with military backing, stopped the blockade and arrested Union leaders (Phelan, 1996). In 1982, the Lands Protection Act (LPA) was established to prevent agribusiness from grabbing land from family farmers to expand their operations. The LPA is viewed as a mechanism to both retain farmer autonomy over their lands as well as to curtail rampant ecological degradation from factory farm expansion. However, established limits to land purchasing have been consequently open to abuse (Phelan, 1996). For instance, in the last 30 years, PEI's largest potato processors have continuously challenged the legislation, acquiring more land through loopholes in passing down holdings to family members as well as variable legal interpretation by the Courts (ibid).

3.2. ALUS on PEI

One response strategy to address the ecological "irrationalities" of intensive agriculture is the implementation of a PES scheme on PEI to financially compensate farmers who retire land vulnerable to soil erosion from cash crop production to instead encourage riparian ecosystem services by planting trees or widening buffer zones. Since 2008, the first and only public PES initiative in Canada operates through the 'Alternative Land Use Services' (ALUS) program on PEI as a provincial environmental policy[2]. The provincial government pays farmers who voluntarily provide ecosystem services, through the adoption of specific land-use prescriptions and based on the market value of land proportionally taken out of production.

ALUS originated in the vicinity of Blanshard in the Canadian prairie province of Manitoba in 2006 with the goal of assessing the acceptability of the program across the country. In three years of operation in Manitoba, ALUS Canada perceived the pilot a success with over 8000 ha of wetlands, native prairie, and riparian areas enrolled into the program and a participation rate of 70% of landowners in the program area (France and Campbell, 2015). The perceived success of the program in Manitoba inspired then Deputy Minister of Agriculture and Land of PEI to implement the program on PEI as a provincial agri-environmental policy. The program aimed to address the consequences of intensive agriculture in exacerbating soil erosion, destroying wildlife habitat, and negatively affecting water quality leading to large-scale fish kill events that attracted considerable media attention (Birt, 2007).

After 12 years of operation, ALUS-PEI is Canada's most successful PES initiative. It has recruited nearly a third of the province's farming operations and enrolled over 3800 ha of productive land into conservation (France and Campbell, 2015). It operates similarly to the Conservation Reserve Program in the US, in which payments are issued in a top-down manner from the provincial government to the farmer upon verification of having adopted one or more of the prescribed ALUS land-use practices. Funding is provided by agricultural budget of the provincial government, partly through the support of a Beverage Container Fee program that requires anyone selling beverages (alcoholic or non) to make a payable deposit under section 10 of the Beverage Containers Act (Government of PEI, 2017). Participation in ALUS-PEI is limited to agricultural land and is eligible for any landowner (rather than land renter) who wants to devote a portion of their productive land to conservation measures. Table 1 highlights the main conservation measures under the ALUS-PEI programme and the payments in CA$ per hectare per year attributed to each activity. Joining ALUS is a straightforward process, requiring the landowner to commit to implementing and maintaining conservation measures for a period of 5 years. After 5 years, the program is renegotiated according to the availability of additional funding. The program is managed by an Implementation Committee comprised of members of the two governmental departments, commodity boards, the University of PEI, and conservation and watershed groups (France and Campbell, 2015).

Table 1
List of ALUS activities and payment rates (Kolinjivadi et al., 2019).

ALUS Activity	Payment rate (2008–2018) in CAD
Buffer zone tree planting	$185 / ha / year
Expanded buffer zones	$185 / ha / year
Grassed headlands	$185 / ha / year
High-slope land retirement	$100 / ha / year
Soil conservation structures (e.g. grassed waterways, berms)	$250 / ha / year
Livestock fencing adjacent to waterways	$0.30 / linear metre / year

In terms of implementation, it has been up to the landowner to make separate agreements with renters on their land as to who is responsible for managing conservation structures and how such additional labour would be reflected in land values for rent. Random audits are conducted to monitor ALUS activities, in which unsolicited farm visits are made to ensure compliance to maintain implemented conservation structures. Most important to note is that assessment of whether conservation outcomes have materialized or not remains deficient with no before-and-after comparisons made of ALUS impacts compared to a counterfactual situation. The program relies entirely on "observable" soil erosion and water quality improvements, which have been confirmed by participating farmers (e.g. France and Campbell, 2015). Implementation Committee members have tended to concur that the program offers a more *effective* approach to tackling soil erosion than the regulatory 'stick' approach alone (Lantz et al., 2012).

Since 2017, a new iteration of ALUS called the New Acre™ Project was initiated elsewhere in Canada as an attempt to quantify and assure effective conservation outcomes from the program in order to provide tangible returns on investment. It is expected that this new iteration of ALUS will influence the operation of the program on PEI. New Acre™ aims to ensure that conservation investors receive the ecosystem services that are tailored to their portfolio. For instance, corporations can tailor-make a portfolio of ecosystem services, ranging from water protection, bees and wildlife, air quality and carbon, and even evidence that the program builds resilience and "touches lives." Conservation outcomes materialize as the number of "acres" purchased by corporate buyers that get transformed as "an acre of land doing nothing to doing something for conservation by generating ecosystem services." (ALUS CEO, *pers. comm.*). The metric of "acres" is viewed as being simple to understand and easily measurable, without getting lost in the quantification of "microns of water being filtered or individual carbon units being sequestered." (ALUS CEO, *pers. comm.*). Investment into the New Acre Project is primarily targeted to "corporate Canada" and is advertised on a twitter feed (e.g. @NewAcreProject). As stated on the website, "the New Acre™ Project promises your corporation a simple and transparent return on your investment…(with) regular reports detailing the concrete benefits generated through your contribution, featuring the metrics that matter to you." (ALUS, 2019).

3.3. Methodology

To explore the ways in which economic incentives for conservation reproduce conditions for the McDonaldization of the landscape, we draw upon the richness of data from 41 semi-structured interviews with subscribing and non-subscribing farmers to the ALUS initiative as well as with 19 ALUS Implementation committee members (comprised of government officials, scientists, environmental NGOs, commodity

[2] Upon being governed by the PEI Government, the ALUS initiative on PEI is not managed by the Weston-family Foundation of ALUS Canada, but is influenced by developments of ALUS Canada.

board representatives, and academics). These interviews were conducted between August and December of 2017. We draw on qualitative characterizations of livelihood challenges, values, and lived experiences of interviewed farmers; key informant perspectives on environmental change on PEI; and insights on local histories of land use and cultural traditions of agricultural communities on PEI. An agrarian systems methodology (see Cochet, 2012) was applied to frame open-ended questions conceptualizing farming practice as historically embedded within socio-political, institutional and economic constraints as well as evolving cultural worldviews of farming habits. This approach highlights how conservation rationalizes the formation of productive landscapes by exploring both the everyday practices involved in the implementation of PES, while also situating agri-environmental conservation within broader economic and political pressures beyond the farm. In the next section, we illustrate how rounds of rationalizing techniques adopting the characteristics of McDonaldization are required to sustain the interests of global capital for cheaper and faster (junk) food. These involve enrolling conservation objectives in ways that both sustain and enhance the conditions for intensive potato production.

4. Results

4.1. Rationalizing the ALUS program

In this section, we illustrate how attempts to attain the fabled desire of nature conservation has meant rationalizing conservation strategies as solutions to unintended social and ecological consequences of intensive production. This process is illustrated by quotes from farmers who have enrolled land into ALUS. As described above, the context of industrial agriculture and its continuous pressure to expand yields has had considerable impacts on both the environment and on farmers' capacities to sustain their livelihoods. As one farmer stated:

> "*All this (debt) has a huge impact…With the pressure of the industry on us to keep doing producing more…to keep growing for less (emphasis made), the debt loads have had a huge impact on our ability to continue in the business and of course to consider caring for the environment. That pressure is getting tremendous…to look after your land- and to keep it in good shape and keep it productive, well that costs money. This is forcing people to do things they shouldn't do in order to meet their yields. Yes, this is irresponsible on the part of the farmer, but look at the underlying stress."* (Prince County)

For potato farmers contracted to PEI's main potato processing industry, the increasing pressure to improve the efficiency of yields per acre to remain competitive in the global marketplace for french-fry production is a key factor influencing land-use patterns. Potatoes represented roughly 81% of total farm profits on PEI between 2008 and 2016, of which nearly 55% derives from the processing industry (PEI Statistics Bureau, 2017). In concert with rising land values, a clear contradiction presents itself between enrolling land in conservation through ALUS, while continuing to farm within the potato processing industry. It is therefore useful to contextualize any conservation advances in relation to socio-economic and political drivers influencing land-use behaviour.

Three factors characterize these drivers, namely, increasing debt; increasing land consolidation, and minimal industry competition on PEI. In relation to debt, net farm receipts by potato farmers on PEI have been outpaced by rising outstanding debt (PEI Statistics Bureau, 2017). Increasing competition from larger industry players in Alberta in Western Canada and in the United States who are able to optimize larger potato yields at lower costs in meeting increasing global demand have strained the PEI potato processing industry. Lastly, many industries involved in the supply chain of the processed potato industry are vertically integrated on PEI, meaning that each company produces a specific market value (e.g. fertilizer, petroleum products, transport infrastructure, potato processing etc.) but is wholly owned by a parent corporation (Kvaløy & Tveterås, 2008). The J.D. Irving Limited conglomerate, which operates on PEI through the potato processor Cavendish Farms, encapsulates the ideals of McDonaldization (Poitras, 2014). It does so by synchronizing supply and demand, lowering transaction costs and thus enhancing economies of scale (e.g. optimizing production). Vertical integration also improves market predictability (e.g. reducing market uncertainty for investment growth) through futures commodity trading, and enhancing control by foreclosing the capacity of alternative market actors to compete with the inertia of a vertically-integrated supply chain.

The PEI government implemented the Environmental Protection Act in 2000 to maintain buffer zones of a minimum of 15 m away from watercourses. The regulation was implemented in response to fish kills, widespread erosion, and deteriorating air and water quality associated with intensive pesticide and fertilizer applications for industrial potato production. The Act was met with stiff resistance from farmers, particularly as it was very strictly enforced by the Department of Agriculture and Land (Kolinjivadi et al., 2019). The introduction of ALUS payments going beyond regulatory limits was viewed as a more conciliatory and farmer-friendly approach that was incrementally more efficient than regulation. As the previous Deputy Minister of the Environment stressed in relation to ALUS:

> "*When farmers produce commodities, regardless of how it is produced, they have a product worth something on the marketplace. Even if they don't provide environmental services for that product, the product value is the same. This is a market failure. Through ALUS, we wanted farmers to produce a different commodity on their farms in addition to their crops. These commodities are clean water, clean air, and quality soil."*

The emphasis on internalizing market failures into new market transactions not only aims to improve control over unintended socio-ecological consequences of adhering to production logics, but also to ensure that conservation outcomes can be measured and regularized. For farmers enrolled into the program, perceptions of the payment approach for agri-environmental measures has taken on a different meaning. As described elsewhere, farmers enrolled land into the ALUS programme as a form of long-term insurance to maintain the productivity of their soils (Kolinjivadi et al., 2019). For some, payments are interpreted as a welcome recognition of their efforts in looking after the environment, as the following quote illustrates.

> "*The ALUS programme is a break in the mindset of expecting farmers to act without recognition. Through the payments, the programme started recognizing the work of farmers for keeping land in protection.*" (Kings County)

Participation in ALUS was not influenced by the total land size, farmed or owned. For instance, some farmers with as few as 5 ha enrolled as much as half their land, while others with closer to 300 ha enrolled 5 ha or less. As described in Kolinjivadi et al. (2019), the most commonly adopted activities under the ALUS programme (e.g. Table 1) were retirement of high-sloped land; the implementation of soil conservation structures, such as grassed waterways; and expanding buffer zones beyond the regulated requirement of 15 m from a watercourse. Farmers enrolled land according to their level of use, whether they believed the land to be marginal for production following advice from consultation with PEI's Department of Agriculture, or based on preference according to personal experience.

However, not all farmers expressed only gratitude for the program and its impacts. While members to the program accepted the payments for the land they retired from production, a number of unintended social and ecological effects emerged. We note three such effects: 1) the lack of recognition of farmers' knowledge; 2) motivational crowding-out; and 3) the application of ALUS as a justification to exonerate blame for continued fish kill events. For some farmers, ALUS represented a novel attempt by the government to lure farmers into government-

supported initiatives. Bearing in mind PEI farmers' historical suspicion of the government on their land-use decisions, several farmers felt the payment was a paternalistic attempt to dismiss their situated knowledge of the land, particularly in terms of knowing how to protect soils from (over)production.

> "*While they pay us, these government programs seem to imply that we naturally destroy the land and will only act with payment to fix the damage. This is condescending and unfair. We don't need to be environmentalists to take care of our soils. We wouldn't be able to farm otherwise*." (Kings County)

In other cases, the introduction of payments resulted in the sentiment that financial incentives should always be provided to farmers if they are expected to act in the public benefit. The replacement of land-use stewardship values for expectations of financial compensation are concerning. Several studies have emerged highlighting the detrimental effects payments may have in crowding-out motivations based on care for land in favour of a purely transactional approach that equates best management practice with financial gain (Ezzine de Blas et al., 2019; Rode et al., 2015). For some farmers, this effect left the feeling that payments were provided to those who have been largely responsible for soil degrading practices rather than those who have been caring for their soils for years prior to the program.

A final unintended consequence is the strategic role ALUS has come to play for farmers to deflect blame from future soil erosion or fish kill events, which have tended to occur after anomalous heavy rainfall events. As climate change continues to influence rainfall patterns on PEI, erosion events may occur regardless of the land-use practices put in place to prevent soil loss (Dunn et al., 2011). In this context, subscription to ALUS serves as a pre-emptive measure for farmers to avoid the risk of costly fines for fish kills caused by erratic rainfall patterns that are beyond their control.

> *"With weather patterns changing, we now get 2 or 3 in. of rain per hour. No buffer zone or grassed waterway will stop runoff with that volume of water, no matter what we do. Then when there is a fish kill from the sedimentation, no one can be blamed. At least with ALUS, we can show we've done our part."* (Prince County)

This phenomenon also reflects the limits of "quick-fix" technical solutions to address unintended and localized ecological degradation when systemic production patterns, centred around the simplification of landscapes, are largely responsible for perpetuating ecological transformation at the global scale (Moore, 2015). It is worth noting that a fixation on conservation efficiency and predictability glosses over other social and ecological "irrationalities." The former of these irrationalities include not-always-amicable relations between renters and land-owners who must decide how land enrolled into ALUS is to be managed in a context of rising land values. The latter of these irrationalities include the emergence of new potato crop pests such as click beetle larvae (e.g. *Agriotes sputator*).

5. Discussion

5.1. Conservation by McDonaldization

As we have shown, the rationalization of industrial agriculture by the potato industry and the PEI government over the last quarter of a century resulted in social and ecological consequences of production, or "irrationalities", requiring new tactics to addressing economic "externalities." We describe this process in Fig. 1 as a vicious cycle resulting from responding to problems created by the same logics that generated the problems in the first place. The choice of the PEI provincial government to apply a PES scheme to address these consequences has in turn resulted in new unexpected social and ecological irrationalities. Yet, the solution continues to reside in engaging farmers to install more efficient, predictable, calculable, and controlling production strategies.

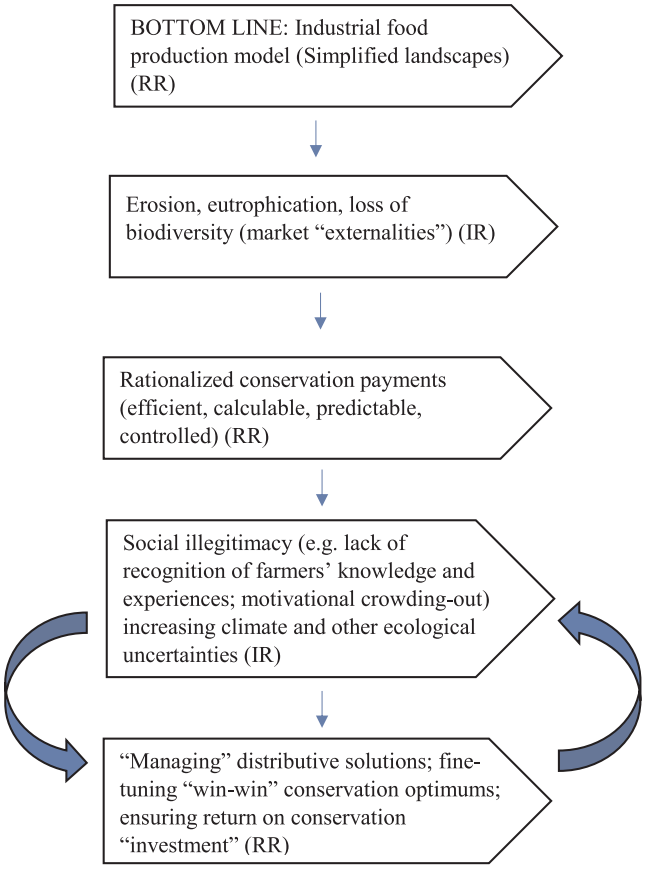

Fig. 1. *Conservation by McDonaldization*: Examples of alternating rationalized responses (RR) to the irrational responses (IR) that result from them. Within an industrialized agriculture model, conservation is increasingly shaped to ensure efficiency, predictability, calculability, and control, with rationalities and irrationalities of conservation ultimately co-producing each other.

Through this rationalization logic, the production model remains unscathed and unworthy of critical attention. Instead, social and ecological repercussions are falsely perceived as mere technical glitches that can be resolved with greater finesse in homogenizing the complexity of human and non-human natures. In the process, the situated knowledge of farmers combined with the affective and emotional relationships that farmers cultivate with the land across generations risks being dismissed in favour of a blind "firefighting" approach that fails to reconcile why "fires" are even emerging.

We argue that optimizing conservation through efficiency, predictability, calculability, and control will never arrive at a "purer" form of conservation. What we term 'conservation by McDonaldization' instead generates new conflicts, risks, and environmental disservices which forever elude arriving at the 'holy grail' of successful conservation, itself rooted in romanticized notions of a passive non-human environment somehow untouched from human action (Enns et al., 2019). "Conservation by McDonaldization" reflects a looping cycle whereby irrationalities emerge precisely from attempts to technically manage them rather than directly engaging with ecological uncertainty and contingent social and political dynamics (e.g. (Myers et al., 2018). The continued incidences of fish kills and motivational crowding-out resulting from paying farmers to care about nature on PEI highlight some of these cascading ecological and socio-political irrationalities. The dimensions of rationalizing conservation are not limited to debates on efficiency and predictability of payments. There is also an important element of state and market control at play. The commanding pressure from the potato processing industry on contracted farmers is completely

absent from discussions among the ALUS Implementation committee. For many ALUS members, inflexible patron-client relations with the processed potatoes industry makes conservation set-asides increasingly risky in a context of ever-narrowing competitive markets. As one ALUS producer claimed:

"*We have to meet our quotas or we risk losing our contracts. For the Irvings to profit, they've got to buy as cheap as they can get. You can't argue with them, they'll just cut you off. You'll be left with land and no place to go with your potatoes*." (Kings County)

The "Cavendish Farms Growing Green Award" offers a useful example to illustrate 'conservation by McDonaldization.' The incentive[3] was launched in 2017 by the potato processing industry to reward and recognize contracted farmers successfully implementing conservation best practice on their land. However, such recognition should not come at the expense of reduced yields, as contracted farmers are required to meet or surpass annual yield quotas (Sustainability coordinator-Cavendish Farmers, *pers. comm.*). Indeed, the incentive for contracted farmers lies in attaining as many rewards from the industry as possible, including the Top Growers' award for highest quality and quantity of yields. Farmers are expected to absorb increasing demands to not only meet their ever-increasing yield requirements, but to do so in a "sustainable" and environmentally-friendly way. In this context, being a member of ALUS does not exonerate farmers from attaining their expected yield quotas. It only offers them the possibility to receive recognition and increase the security of their contracts with the industry in the future.

In response to these cascading social and ecological side-effects of intensive production, efforts to double down on ensuring efficiency, predictability, calculability, and controllability of outcomes are being put in place. As of 2019, the ALUS New Acre™ Project, while operating elsewhere in Canada and not yet on PEI, exemplifies the most concerted attempt at framing conservation through McDonaldization. It aims to provide what ALUS CEO calls a "purer transaction" to more directly connect Canadian corporations to conservation outcomes. Corporations are encouraged to purchase quantifiable acres to enroll into targeted conservation schemes (e.g. wetland restoration and afforestation projects) with the assurance that in doing so they can be "respected in the communities they operate in, know they are a good corporate citizen, and make sure their employees know their company is a good place to work for." (ALUS CEO, pers. comm.). In terms of the calculability dimension, ALUS New Acre™ aims to adopt a pragmatic approach to measuring impact by relying on "acres" purchased and enrolled into conservation. Corporate buyers can opt to add premiums by bundling ecosystem services, and other valued categories like "resilience", in what the ALUS CEO has termed "Cadillac carbon":

> *"Carbon is an easy thing to obtain if you're looking at a singular unit. But if you're more thoughtful about how you spend your environmental dollars, terrestrial carbon has measurable co-benefits, which is more value-added. I call this "Cadillac carbon." We don't all buy the cheapest car we can, sometimes we buy better cars because we're trying to get another suite of benefits around it. This is the type of corporate buyer we want to see purchasing ALUS acres. A company might be interested in water filtration and resilience as the main components of their portfolio, but we will suggest they can also market the biodiversity, native species, and sequestered carbon they'll also get."* (ALUS CEO)

Corporations act as the buyers of "acres" and their ancillary benefits. For example, a recent deal confirmed by Canada's largest multinational bank (TD Bank) also provides financing for "social and community metrics" to measure the impact of their investments based on how many lives were "changed", how many lives were "touched", and how many lives were "influenced" by ALUS 'acres'.

> *"140 people coming to a summer tour to visit an ALUS farm to see the projects that have been completed would be an example of "lives influenced." Eventually that leads to a place where one can identify a culture of care developing in communities around environmental issues that can be given metrics. This is the sort of thing we can measure."* (ALUS CEO)

Finally, for ALUS New Acre ™, any relation between farmers, farming communities, and the land that provides value can be viewed as a commodity that corporate buyers can pay for to "share the benefits." In doing so, institutions are set in place to more thoroughly control relations of care that generate meaningful values and turn them into new commodities for profit.

> *"We believe that the value for caring for the land is first created by the farmer and their community. With the New Acre ™ project, we are able to share that value with the corporation that pays for it. The value comes from local communities. They may be selfish and keep it for themselves, but there's a broader, global benefit to be gained from that."* (ALUS CEO).

5.2. McDonaldization by Conservation

Just as conservation is being made to emulate and align with production imaginaries for the sake of efficiency, conservation is equally required to reproduce the material conditions for perpetual production. The embeddedness of PEI's processed potato industry within the highly competitive and global fast food business has resulted in a singular focus on sustaining and enhancing productivity. The trajectory of land-use development on PEI has tended to reinforce a model of extractive agriculture through monocultured crop specialization, increasing mechanization, and loans tied to growing processing contracts (Phelan, 1996). These dynamics have obliged farmers to intensify and expand operations to stay solvent as prices for their produce continue to drop (Hazell and Woods, 2008). As Fig. 2 shows, the rationalizing logic of an industrial agricultural model is itself a manifestation of the characteristics of McDonaldization, based on mechanization and uniformity. The unintended outcomes resulting from intensive production (e.g. superweeds and superbugs, soil and biodiversity loss, eutrophication, farmer indebtedness) impose a vicious cycle in which further rounds of rationalization becomes the *only* politically and economically sanctioned path-dependent solution. Such rationalization proposes strategies that merely postpone irreparable damage to social and ecological conditions in order to sustain intensive production. These include precision agriculture techniques that maximize yields while minimizing inputs, taking on more loans, growing pest-resistant crop cultivars, and subscribing to PES.

Industrial and market-based production models place agency on consumers to impart change on the supply chain in line with their preferences and tied to their purchasing power. However, there exist cognitive and institutional barriers associated with the spatial and temporal lags between places of food production and far-away centres of consumption. This means that consumers choices are restricted to price, observable characteristics, and certification (e.g. organic labelling), with the latter serving as re-rationalization techniques in the establishment of niche markets (Kremen et al., 2012). The costs of land care therefore fall back upon farmers who already carry the burden of maintaining and increasing yield-per-acre targets as stipulated in annual contracts. This is due not only to the fact that land care is less valued by final consumers far away from the site of production, but more importantly to increasing demand for cheaper food requiring greater yields regardless of the social and ecological context of production (Patel and Moore, 2017). A concerning tension of scale

[3] From communication with the Director of Environmental Sustainability at Cavendish Farms, the Award is to be based upon metrics determined by the Potato Sustainability Initiative, in which participating growers and potato processors report performance data that are used to calculate nutrient use efficiency; irrigation-use efficiency; pesticide stewardship; greenhouse gas reduction; reuse/recycling, and worker safety.

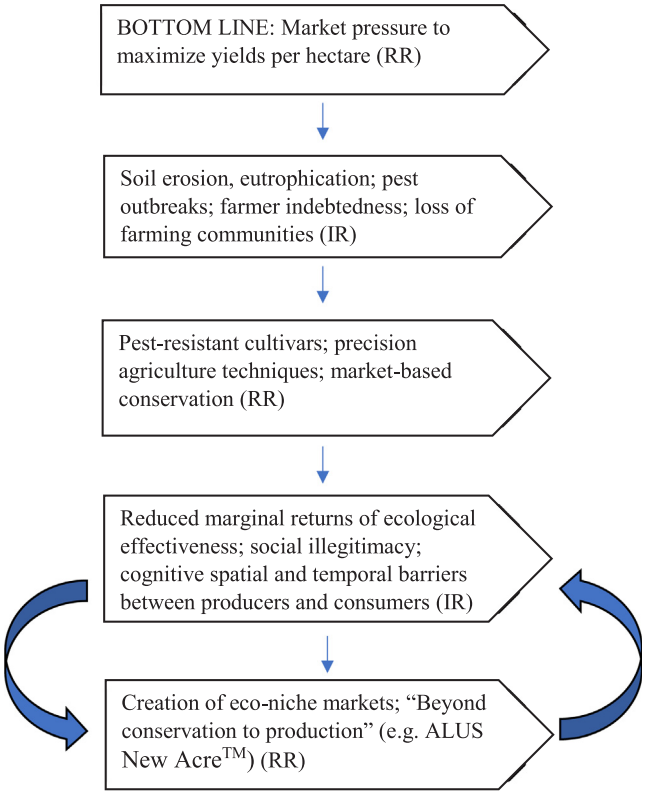

Fig. 2. *McDonaldization by Conservation*: Examples of alternating rationalized responses (RR) to the irrational responses (IR) that result from them. In order to maximize yields of agricultural products, conservation must produce new marketable goods and/or replenish the biophysical basis for continued industrial production, with rationalities and irrationalities of maximizing agricultural value ultimately co– producing each other.

becomes apparent between local choices made by farmers and the potato processor on PEI on the one hand and the demands of globalized free trade on the other hand, to which Canada is a key player. Yet, the introduction of PES through the ALUS program sidesteps any attempt to address this tension.

On-farm conservation through payment schemes ultimately get subsumed as "*turning a cost of doing business into an opportunity for improving production in the long-term*" (ALUS member, *pers. comm*). This is because the model of intensive agriculture does not change with the introduction of PES. In this manner, rationalized strategies for conservation serve as necessary investments in soil productivity to maintain and ideally optimize production. As one Implementation Committee member stated:

> "The ultimate environmental goal is to make sure we are getting greater yields with minimal environmental costs by building soil organic matter over time."

Lastly, the emphasis on optimizing production is further reinforced in the new ALUS New Acre™ Project as it conceptualizes conservation values as new extractable commodities from farming landscapes. As the CEO of ALUS claims on the New Acre ™ initiative:

> *"By having all these farmers and their local communities create thousands of acres of [conservation] outcome, we've really tapped into the productive capabilities of farmers. A farmer can produce whatever you want them to produce, just give them the market signal to do it. It becomes key then to turn that tap on. We can now look at the farming community as providing solutions. When we talk about solutions, we're talking about something that's valuable."* (ALUS CEO)

From this view, intensive agriculture not only fails to be transformed through the introduction of conservation payments, but in fact is further entrenched when conservation is rationalized as a new source of profitable value to optimize production. Consequently, conservation both fails to serve as a fundamental counter force in the tendency towards ecological simplification and its rationalization paradoxically evokes efforts to further entrench such simplification in efficient, predictable, calculable and controllable ways (i.e. McDonaldization by conservation).

5.3. Beyond McDonaldization: From rationalization to responsibility

The incessant focus of promoting conservation strategies that must be justified in terms of their capacity to predict and maximize outcomes omits important processes that may influence how and why conservation takes place (Davis and Goldman, 2017). Rather than a "cost of doing business" to internalize into the economy as environmental economists portray, conservation could also emerge as a convivial practice of joyful regeneration between farmers and the landscapes they work in and have come to love (Singh, 2015). These more affective and caring responses are deeply emotional reactions to attempts to hollow out the interdependent relationships between the quality of life of farmers, farming communities and healthy soils, water, and air. As such, these relations warrant greater consideration in the aims of breaking the cycle of rationalizing conservation for production. However, such strategies must be protected against re-rationalization strategies in the production of "caring" commodities as shown by the example of the ALUS New Acre™ Project.

For some farmers on PEI, decisions to engage in land care to rehabilitate soils and protect water courses from sedimentation reflected faith in personal experience and a deep-seated desire for self-determination in land-use decision-making. This desire appeared not to emerge from coercion through external regulatory threats or incentives like PES programs, but rather as a form of emergent autonomy. In some cases, inspiration for this self-determination was drawn upon from earlier historical struggles against government imposition regarding land-use decisions. As one non-program farmer, who was potentially eligible for ALUS, stated:

> *"I'm acting in response to my experience of working this land, not to any regulation or payment to entice me. It's my own experience to decide what I do here. I know that in some areas, the buffer zones need to be extended by 20 m more than regulation requires, because I know they are vulnerable areas to soil loss."* (Prince County)

Attempts by farmers to reassert autonomy in their farming livelihoods and for land stewardship offer insights into how resistance emerges against production logics. From the interviews we conducted with farmers, these attempts have included: court cases between farmers and the processing industry to demand information on price signals prior to harvests; efforts by farmers to enforce and strengthen land protection laws that limit the size of holdings by any one company; retaining independence in seed production despite pressure for contracted farmers to purchase industry-owned seeds; the establishment of farmer-led agri-environmental discussion groups; the growth of farming cooperatives; and the diversification of production strategies to rehabilitate the land. It is these efforts geared towards changing production systems that might serve as the "starting point to incentivize conservation," (Davis and Goldman, 2017: 5).

On concrete steps towards politicizing land stewardship is the example of a group of farmers in the Eastern end of PEI's Prince County involved in informal agri-environmental discussion groups. These take place around kitchen tables among neighbours, to share lessons on best practice, including experimentation with cover crops, extending buffer zones beyond regulated requirements. Such spaces facilitate strategizing on how to share equipment to offset debt burdens and to discuss ways of experimenting with more sustainable farming methods. Perhaps most interesting is the socialization that takes place in an

otherwise cutthroat competitive environment where the logic of enhancing yields has swallowed up the farms of neighbours who failed to stay afloat. One of the reasons for the emergence of the agri-environmental group in East Prince was a sense of distrust towards both the government and the industry, viewed to be impinging on the expertise and inherited knowledge of farmers.

> *"Many farmers also say, 'we are farmers and we're not going to lose our soil.' They can't tell us what we can and cannot do. Some of us join producer-established discussion groups, where we talk about soil care and share lessons. But not because someone else is coming in and telling us what to do."* (Prince County)

Potential therefore exists for more transformative and systemic socio-ecological change based on the solidarities and social interdependencies that are built through sharing best practice in soil retention and by creating an autonomous space to discuss yields, contracts, and treatment by the potato processor. The re-politicization of contracts with the industry also enhances the agency of farmers to influence collective bargaining power in the renewal of contracts with the processing industry. Through this example, we observe that the reconstruction of the agricultural commons from the endless pressure of commodity production could potentially emerge in ways that operate outside market control and without interference from the government. This by no means implies that such relations emerge out of a rejection to enhance profit. Rather, it suggests a desire to reclaim autonomy from the ruthless mechanization of production and to prioritize regeneration of the land and social solidarity in farming communities.

Our analysis of the broader production system shifts the onus of preventing environmental degradation away from victimizing farmers, who have little autonomy to confront such a system merely by participating in PES schemes, to the logics which attempt to sustain and enhance industrial agricultural production. Put differently, the model of intensive agriculture must be made to change with the introduction of PES or any other agri-environmental programme, or the effect of the latter will be incapable of achieving the scale of change required for a transition towards sustainable agriculture.

Lessons could be drawn from a growing literature exploring the role that PES might play in fostering radical relations of care by considering farmers not (merely) as self-utility maximisers, but as empathetic actors holding moral and ethical commitments to the land they farm (Büscher and Fletcher, 2019; Wynne-Jones, 2017; Jackson and Palmer, 2015; Muniz and Cruz, 2015). This conceptual shift might involve designing financial incentives to foster relationships of care in negotiating land-use practices, rather than gaining market share in new social or environmental commodities or corporate social responsibility schemes. Experimental approaches are needed that correspond to different historical, cultural, and environmental contexts and that cannot be imposed through economically rational templates or models.

In the case of PEI, an alternative lens of how caring relations emerge might benefit from exploring the ways by which farmers resist interference by external actors (e.g. the State or corporate interests of the ALUS New Acre™ Project) on the autonomy of their land-use practices and collective organization. In this way, such relations might engender conservation outcomes beyond the technical capacity to measure and "produce" ecological conditionality. One hopeful example, described in greater detail in Kolinjivadi et al. (2019), highlights how ALUS members on PEI have joined together with their neighbours through co-operative farming by reclaiming the autonomy over the marketing of their crops as "organic" and "local" produce, and have integrated their adoption of agri-environmental measures within these alternative sets of relationships to the land. This example highlights how engendering caring relations between farmers and the land can succeed if rooted in a process of struggle against any attempt to objectify those relationships.

6. Conclusion

Over the past 40 years, the inspiring agricultural landscapes of PEI as penned by L.M. Montgomery in *Anne of Green Gables* have been steadily transformed into brutally calibrated landscapes for commodity production. We have attempted to illustrate here how commitment to McDonaldization, as a particular organizational logic of production transforming landscapes, is not questioned with conservation strategies like PES, but risks becoming reinforced through the production of new conservation commodities such as "lives touched," "resilience," and "Cadillac carbon." In the process, PEI's farmers and soils are being continuously primed to optimize production for processed potatoes to match the efficiency and regularity of consumers' demands for McDonalds French-fries. At the same time, conservation is being framed as generative of new products to tuck into the "Happy Meal" of PEI's so-called "working" agricultural landscapes.

Our analysis also shows how attempts to rationalize landscapes for production create all sorts of beneficial and detrimental irrationalities including farmer indebtedness, climatic and economic uncertainties, the emergence of pests, political resistance, and also novel affective relationships between farmers and the land. In this context, the navigation of everyday conflict by building relationships between human and non-human is crucial for rejuvenating life in the face of deadening logics of McDonaldization. To this end, the potentially transformative "irrationalities" that emerge from each successive conservation attempt to reinforce production logics might also provide clues to alternative futures. They open a potential space for political resistance against the homogenizing effects of reinforcing production discipline, whether that is for expanding yield-per-acre, or maximizing conservation-value per acre demands. Other "irrationalities" might include acts of care, in which farmers are recognized as active political agents resisting attempts to reduce their relationships to each other and to the land as solely new commodities for production. In other words, the "irrational" responses to production logics cannot become new forms of production. They must instead be guided by engendering relations in common between the people, rivers, trees, and animals of PEI. Restoring and rejuvenating agricultural natures requires breaking from the McDonaldizing logics of the production machinery, conservation-friendly or otherwise, to democratically renew the political and ethical commitments for the kind of agriculture Prince Edward Islanders believe most aligns with their values.

CRediT authorship contribution statement

Vijay Kolinjivadi: Conceptualization, Methodology, Investigation, Writing - original draft, Writing - review & editing, Funding acquisition. **Jean-François Bissonnette:** Writing - original draft, Writing - review & editing, Funding acquisition. **Alejandra Zaga Mendez:** Writing - original draft, Writing - review & editing, Visualization. **Jérôme Dupras:** Supervision, Project administration, Writing - review & editing, Funding acquisition.

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References

Adam, B., 1998. Timescapes of Modernity: the environment and invisible hazards. Routledge, New York, USA.

Alternative Land Use Services (ALUS) Canada, 2019. Available from https://alus.ca (accessed July 2019).

Birt, K., 2007. Runoff from potato farms blamed for fish kills on Canadian island. J. Soil Water Conserv. 62 (6), 136A.

Borras Jr, S.M., Franco, J.C., 2011. Global Land Grabbing and Trajectories of Agrarian Change: A Preliminary Analysis. Journal of Agrarian Change 12 (1), 34–59.

Büscher, B., Fletcher, R., 2019. Towards convivial conservation. Conservation and Society 17 (3), 283–296.

Castree, N., 2009. The Spatio-temporality of Capitalism. Time & Society 18 (1), 26–61.

Cavanagh, C.J., Benjaminsen, T.A., 2014. Virtual nature, violent accumulation: the 'spectacular failure' of carbon offsetting at a Ugandan National Park. Geoforum 56, 55–65.

Cavanagh, C.J., Vedeld, P.O., Trædal, L.T., 2015. Securitizing REDD+? Problematizing the emerging illegal timber trade and forest carbon interface in East Africa. Geoforum 60, 72–82.

Ceddia, M.G., Sedlacek, S., Bardsley, N.O., Gomez-y-Paloma, S., 2013. Sustainable agricultural intensification or Jevons paradox? The role of public governance in tropical South America. Global Environ. Change 23 (5), 1052–1063.

Cochet, H., 2012. The *system agraire* concept in francophone peasant studies. Geoforum 43 (1), 128–136.

Davis, A., Goldman, M.J., 2017. Beyond payments for ecosystem services: considerations of trust, livelihoods and tenure security in community-based conservation projects. Oryx (August edition). https://doi.org/10.1017/S0030605317000898.

Dunn, A.M., Julien, G., Ernst, W.R., Cook, A., Doe, K.G., Jackman, P.M., 2011. Evaluation of buffer zone effectiveness in mitigating the risks associated with agricultural runoff in Prince Edward Island. Sci. Total Environ. 409, 868–882.

Enns, C., Bersaglio, B., Sneyd, A., 2019. Fixing extraction through conservation: on crises, fixes and the production of shared value and threat. Environment and Planning E: Nature and Space 2 (4), 967–988.

Ezzine-de-Blas, D., Corbera, E., Lapeyre, R., 2019. Payments for Environmental Services and Motivation Crowding: Towards a Conceptual Framework. Ecol. Econ. 156, 434–443.

Ferraro, P.J., Kiss, A., 2002. Direct payments to conserve biodiversity. Science 298 (5599), 1718–1719.

Fletcher, R., Büscher, B., 2017. The PES Conceit: Revisiting the Relationship between Payments for Environmental Services and Neoliberal Conservation. Ecol. Econ. 132, 224–231.

France, R.L., Campbell, J.B., 2015. Payment for agro-ecosystem services: developmental case-history descriptions of Canada's Grassroots 'ALUS' Programs. Research Journal of Agriculture and Environmental Management 4 (9), 405–431.

Government of Prince Edward Island, 2017. Beverage Containers Act. Accessible online at: https://www.princeedwardisland.ca/sites/default/files/legislation/B-02-1-Beverage%20Containers%20Act.pdf.

Hall, A., 1998. Sustainable agriculture and conservation tillage: managing the contradictions. Canadian Review of Sociology/Revue canadienne de sociologie 35 (2), 221–251.

Hazell, P., Wood, S., 2008. Drivers of change in global agriculture. Philosophical Transactions of the Royal Society of London B: Biological Sciences 363 (1491), 495–515.

Jackson, S., Palmer, L.R., 2015. Reconceptualizing ecosystem services: possibilities for cultivating and valuing the ethics and practices of care. Prog. Hum. Geogr. 39 (2), 122–145.

Kolinjivadi, V., Zaga Mendez, A., Dupras, J., 2019. Putting nature 'to work' through Payments for Ecosystem Services (PES): tensions between autonomy, voluntary action and the political economy of agri-environmental practice. Land Use Policy 81, 324–336.

Kolinjivadi, V., 2019. Avoiding dualisms in ecological economics: towards a dialectically-informed understanding of co-produced socionatures. Ecol. Econ. 163, 32–41.

Kremen, C., Iles, A., Bacon, C., 2012. Diversified Farming Systems: An Agroecological, Systems-based Alternative to Modern Industrial Agriculture. Ecol. Soc. 17 (4), 44.

Kvaløy, O., Tveterås, R., 2008. Cost structure and vertical integration between farming and processing. J. Agric. Econ. 59 (2), 296–311.

Lantz, V., Anderson, T., Johnston, L., 2012. A Survey of Farmer Perspectives on the PEI ALUS Program. Linking Environment and Agriculture Research Network (LEARN).

Li, T.M., 2007. The Will to Improve: Governmentality, Development, and the practice of Politics. Duke University Press, London.

Li, T.M., 2014. What is land? Assembling a resource for global investment. Transactions of the Institute of British Geographers 39 (4), 589–602.

MacDonald, T., 2019. M'ikmaq History on PEI. Mi'kmaq Confederacy of PEI. Available online: http://mcpei.ca/wp-content/uploads/2019/08/Mikmaq-History-on-PEI-June-2019.pdf.

MacFayland, J., Scott, N., 2019. Other Plans: Development and Agriculture in Prince Edward Island. NiCHE: Network in Canadian History and Environment. Available online: https://niche-canada.org/2019/06/27/other-plans-development-and-agriculture-in-prince-edward-island/.

Mettepenningen, E., Beckmann, V., Eggers, J., 2011. Public transaction costs of agri-environment schemes and their determinants – analysing stakeholders' involvement and perceptions. Ecol. Econ. 70 (4), 641–650.

Moore, J.W., 2015. Capitalism in the Web of Life: Ecology and the Accumulation of Capital. Verso Book, New York, NY, USA.

Morris, C., Reed, M., 2006. From burgers to biodiversity? The McDonaldization of on-farm nature conservation in the UK. Agric. Hum. Values 24 (2), 207–218.

Muniz, R., Cruz, M.J., 2015. Making nature valuable, not profitable: are payments for ecosystem services suitable for degrowth? Sustainability 7 (8), 10895–10921.

Muradian, R., et al., 2013. Payments for ecosystem services and the fatal attraction of win-win solutions. Conservation Letters 6 (4), 274–279.

Myers, R., Larson, A.M., Ravikumar, A., Kowler, L.F., Yang, A., Trench, T., 2018. Messiness of forest governance: How technical approaches suppress politics in REDD + and conservation projects. Global Environ. Change 50, 314–324.

Patel, R., Moore, J.W., 2017. A history of the world in seven cheap things: a guide to capitalism, nature, and the future of the planet. University of California Press, Berkeley, CA, USA.

Phelan, R., 1996. Islanders and the Land: The Land Struggle in Prince Edward Island. Saarbrücken, Lambert.

Poitras, J., 2014. Irving Vs. Irving: Canada's Feuding Billionaires and the Stories They Won't Tell. Penguin Random House Canada, Toronto, Canada.

Potter, C.A., Wolf, S.A., 2014. Payments for ecosystem services in relation to US and UK agri-environmental policy: disruptive neoliberal innovation or hybrid policy adaptation? Agric. Hum. Values 31, 397–408.

Prince Edward Island Statistics Bureau, 2017. Province of Prince Edward Island 43rd Annual Statistics Review. Government of Prince Edward Island, Department of Finance. Available from https://www.princeedwardisland.ca/sites/default/files/publications/web_asr.pdf (accessed November 2018).

Randall, J.E., Kitchen, P., Muhajarine, N., Newbold, B., Williams, A., Wilson, K., 2014. Immigrants, islandness and perceptions of quality-of-life on Prince Edward Island, Canada. Island Studies Journal 9 (2), 343–362.

Ritzer, G., 1996. The McDonaldization thesis: is expansion inevitable? International Sociology 11 (3), 291–308.

Ritzer, G., 2003. Islands of the living dead: the social geography of McDonaldization. American Behavioral Scientist 47 (2), 119–136.

Ritzer, G., 2010. Globalization: A Basic Text. John Wiley & Sons, Chichester, UK.

Rode, J., Gómez-Baggethun, E., Krause, T., 2015. Motivation crowding by economic incentives in conservation policy: a review of the empirical evidence. Ecol. Econ. 117, 270–282.

Singh, N.M., 2015. Payments for ecosystem services and the gift paradigm: sharing the burden and joy of environmental care. Ecol. Econ. 117, 53–61.

Tsing, A.L., 2015. A Feminist Approach to the Anthropocene: Earth Stalked by Man. Public Lecture at Barnard College, New York, NY on 10th November 2015. Available online at: http://bcrw.barnard.edu/event/helen-pond-mcintyre-lecture-a-feminist-approach-to-the-anthropocene-earth-stalked-by-man/.

Tsing, A.L., 2016. Earth stalked by man. The Cambridge Journal of Anthropology 34 (1), 2–16.

von Werlhof, C., 2013. Destruction through 'Creation': The 'Critical Theory of Patriarchy' and the Collapse of Modern Civilization. Capitalism, Nature, Socialism 24 (4), 68–85.

Wunder, S., 2015. Revisiting the concept of payments for environmental services. Ecol. Econ. 117, 234–243.

Wynne-Jones, S., 2017. Understanding farmer co-operation: Exploring practices of social relatedness and emergent affects. Journal of Rural Studies 53, 259–268.