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Effects of Diverse Property Rights on Rural Neighbourhood Public Open Space (POS) Governance: Evidence from Sabah, Malaysia

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Abstract: There are severe issues of public open space (POS) underinvestment and overexploitation. However, few studies have been conducted on the property rights structure and its impacts on rural commons governance, specifically concerning local neighbourhood residential POS quality and sustainability. The social-ecological system framework and the new institutional economics theory were employed to examine the local diverse property rights system and its effects on the emergence of POS dilemmas. Rural commons covering neighbourhood residential Country Lease (CL) and Native Title (NT) POS from the districts of Kota Kinabalu and Penampang, Sabah Malaysia were selected. A mixed-method phenomenological case study, involving multi-stakeholders' perspectives across public-private-user sectors, was employed. This study revealed four main interconnected property rights issues, including attenuated rights, incomplete rights, maladaptive rights, and security-based de facto perceptive rights, under the complex state-private regime, which incentivise the opportunistic behaviour of individuals in externalising POS commons dilemmas. The findings further inferred that the local diverse property rights issues and POS dilemmas caused, and are associated with, other rights issues and dilemmas, forming a rights-dilemmas nexus. Not only do the institutional failures actuate POS dilemmas, but the former also engender other forms of property rights failures, while the latter cause other POS dilemmas. This paper suggests policy and management insights to public officials, in which the importance of the institutional-social-POS behavioural factor and the re-engineering of POS governance via adaptive property rights realignment are emphasised.

Keywords: diverse property rights effects; property rights failures; transaction costs; commons dilemmas; rural; neighbourhood; Residential Public Open Space (POS); resource governance and management; Sabah Malaysia

JEL Classification: D01; D02; D23; D62; K11; O21; P25; Q24; Q26

1. Introduction

Local governments provide various local public goods (services and facilities) which are essential to serve as a public purpose, and one of them is public open spaces (POS) for both urban and rural neighbourhood contexts. Since POS provides numerous ecosystem services and values including economic, ecological and social benefits, adequate protection and efficient management are necessary. Although there has been a plethora of studies related to the preservation of public open space (POS), the perennial problems of state-owned POS concerning space over-exploitation, underinvestment and underutilisation, and mismanagement, including vandalism, inaccessible and unsafe spaces, and illegal land conversion to other purposes are still prevalent, especially in developing countries,

thereby causing POS negative externalities (Foster and Iaione 2016; Sangmoo 2015). These POS issues and negative externalities are also discovered in the local rural residential neighbourhood context, specifically in Sabah, Malaysia (Ling et al. 2016; Ling and Leng 2018). As the above problems and social costs of Tieboutian-modelled (government-managed) POS (Tiebout 1956) that occur are associated with governance, social consumption and management, rather than the initial and temporal phase of spatial planning and architectural design-based issues¹, a multidisciplinary approach that involves an institutional-social-ecological lens is required (Ling et al. 2019; Ling 2019a).

Mainly, the social-ecological system (SES) by Ostrom (1990) and new institutional economics (NIE) by Coase (1960) and Williamson (1975) are adopted as analytical frameworks to shed light on the local residential neighbourhood commons POS planning context, to investigate the effects of institutions on the social-ecological behavioural interaction and its quality outcomes (Lai et al. 2015). These theoretical underpinnings by the three Nobel laureates above were selected because they have proven to be relevant, robust, and influential in investigating and understanding a wide range of political-economic issues, mainly dealing with the effects of institutions and property rights on common resources (e.g., POS) governance (management and consumption) and allocation that consequently determine resource quality and sustainability.

Based on the literature review, there is growing concern that an institutional factor will have fundamental impacts on ecological and economic resources distribution, and its sustainability outcome. However, our understanding of such institutional design, encompassing the components of the institutional environment (e.g., institutions) and institutional arrangements (e.g., property rights) in common resources remains limited. Although the literature of property rights systems on the social and economic performance (Webster et al. 2016), natural traditional commons (e.g., pastures and agriculture) (see Lu and Xie 2018), and common pool resources (CPRs) is copious, and is rapidly emerging in urban commons (Foster and Iaione 2016), such microeconomics institutional dimensions on rural neighbourhood commons, however, receive little attention from scholars and practitioners. The effects of the property rights system and transaction costs alignment, particularly in relation to the theories of opportunism and social (commons) dilemmas have been under-researched, and are less empirically explored, in the rural neighbourhood POS management and governance context of developing countries. Despite the ample pieces of evidence from the above property rights studies on various social-economic-commons settings, their findings may not always be reflective, nor can they be directly extrapolated to other commons contexts. Thus, rural commons, particularly in developing countries, are worth studying on the case-by-case basis because they are often associated with a diverse, weak institutional design, and unique, complex SES characteristics (Ling and Leng 2018).

Moreover, most of the property rights issues above have been studied in a compartmentalised, isolated (individual) manner, without showing clear associations between the rights issues, which subsequently provides a less realistic, holistic understanding and answers to the resource governance and sustainability issues. Additionally, only a few property rights issues, mostly revolving around insecure property rights and ill-defined property rights and their effects, have been investigated in their economic, social and environmental commons contexts (Brown 2015; Kaiser et al. 2018; Lu and Xie 2018; Webster et al. 2016). Other potential property rights issues and their distinct interrelationships, among others, encompassing attenuation of rights, conflicts between de facto and de jure rights, maladaptive rights and incomplete rights, which also influence common resources governance and sustainability have not been discussed in existing studies. In addition, the above studies were undertaken either in a fully quantitative (Webster et al. 2016) or qualitative (Brown 2015) fashion, that mostly relied on the one-side stakeholder sector. Thus far, little or no research is being done using a mixed-method design,

¹ Urban and rural public open spaces concerning spatiality (e.g., location, shape, and size) and architecture have been strategically planned in the design stage, and the provision of facilities is sufficient, which overall give quality spaces. However, such good condition and quality of POS may not be sustained due to defective consumption and management behaviour issues of individuals.

especially taking into account multi-stakeholders' perspectives across three different sectors, namely public-private-user stakeholders simultaneously, which is believed to provide more holistic views on property rights impacts on commons governance and quality.

Against the above background and justifications, this mixed-method study using a cross-sector, multi-stakeholders' approach, therefore, examines the commons dilemmas of rural POS² in relation to its consumption and provision/management, and the quality externalities ensued by the diverse, complex property rights structure of Sabah, Malaysia (see Table 1 below). The three-fold research questions addressed in this paper are (i) what are the property rights issues/failures found in the local institutional environment? (ii) What are the possible social-POS management and consumption dilemmas in the local institutions? (iii) What is the connection between the local institutional property rights failures, POS commons dilemmas, and externalities emergence? From an institutional-social-ecological perspective, why and how the local complex property rights system influences rural POS quality and sustainability?

This study is significant because it intends to bridge the lacuna in the theoretical consensus about human behaviours, facing multiple social dilemmas under an adversarial institutional design (institutions and property rights). Moreover, this study is in line with the targets and the essence of global policies and initiatives, namely the 11th and the 12th Sustainable Development Goals 2030 on sustainable cities and communities and the responsible resource production and consumption, respectively, as well as the New Urban Agenda on the importance of providing safe, inclusive, equitable accessible, green, and quality public spaces in both urban and rural areas.

The remainder of the paper is structured into five sections as follows: (i) literature review of institutional and economic theories, failures of property rights arrangement, common pool resource (CPR), opportunism, social dilemmas, and the institutional-behavioural impacts on commons governance and management, in which both a theoretical framework and a conceptual framework are formulated; (ii) methods and choice of research setting, sampling techniques, data collection strategy, instruments, and data analysis; (iii) the results and findings of the associative and causal-effect connections between institutional failures, opportunistic POS commons dilemmas, and externalities emergence; (iv) discussion; and lastly (v) conclusion.

2. Rural Neighbourhood Residential Commons: POS Quality as a CPR

POS allows individuals to get non-exclusive accessibility and easement. In the context of a neighbourhood, as [Agboola et al. \(2018\)](#) asserted, neighbourhood POS is *"a social area situated in a neighbourhood where various passive and active sharing activities are carried out without contesting for users' accessibility, right of use and ownership. In other words, it is an arena that favoured publics' accessibility, meeting, interaction and engagement."* As POS provides an opportunity for people to interact in a residential neighbourhood and to build a healthy residential community, POS quality regarding aesthetic, safety, functionality, and cleanliness should be taken into consideration. Considering the growth of the commons theory ([Ostrom 1990](#)), POS is known as a common resource—a general term that refers to a shared, public resource system, in which individuals have equal rights of access and use. Examples of neighbourhood residential commons are community parks, recreational spaces, playgrounds, and gardens ([Colding et al. 2013](#)) that possess two inherent natures of a CPR, namely non-exclusionary and rivalrous (subtractable). This means that, instead of being considered as pure public goods with the non-rivalrous and non-excludable attributes, POS with CPR attributes have difficulties or require high cost (whether institutionally or physically) in excluding and prohibiting the access of others to the resources, and every access and consumption of the resource by an individual can reduce the opportunity and enjoyment of other users on the resources (see [Ling et al. 2019](#)). However, this does

² The terms including rural POS, POS, rural commons, rural neighbourhood commons, local POS, and neighbourhood residential commons are used interchangeably in this paper because they signify the same resources within the rural setting.

not entail that a CPR is a problem by itself; instead, it is crucial to identify the factors that can aggravate the present commons issues, and in this study, the factor that will be examined is the institutional property rights structure.

3. SES Framework and NIE Theories: Interplay between Institutions, POS Governance and Social Dilemmas

An SES diagnostic framework is considered to be a relevant and powerful heuristic for investigating complex social-ecological behavioural interactions and their sustainability outcome (Ostrom 2009). The multidisciplinary Coasian NIE approach (Coase 1960) embracing the theories and concepts of commons/CPRs, opportunism, social dilemma/game theory, and self-organising collective action are also embedded into the SES framework, for a more robust analysis in discussing the human-environment behavioural interactions, particularly in understanding and explaining the implications of institutions, property rights, transaction costs, and their interrelationships on the social-ecological quality and sustainability outcome (Ling 2019a). Deriving from Ostrom's (1990) institutional analysis and development framework coming to a basic, single-level SES framework (see Ostrom 2009 for the graphical illustration of an SES), within a more complex, multitier SES, the systemic framework is composed of several key components, namely ecological resources, in this case, it is common resources (i.e., POS), resource units (i.e., POS facilities and amenities conditions and functionality, landscape and cleanliness of surroundings), actors (residents, public users, land officers, local authority, and managers/private suppliers), and governance/institutions systems (organisations and laws governing and regulating the management and consumption rights of POS). The above components and other relevant sub-components interact, consequently accounting for POS quality and sustainability outcomes.

3.1. Institutions

Institutions are the rules of the game (i.e., a prime mover) in a society or an environment; they are the humanly developed constraints that organise, coordinate, regulate, and determine human interactions and their decision-making outcomes (see North 1991). Institutions typically consist of formal (de jure/legal) constraints (rules, laws, constitutions, regulations or guidelines, by laws, judicial decisions, and government policies), and informal (de facto) constraints (conventions, customs, and practice). These macro-level institutions (institutional environments) therefore extend institutional effects to a micro-level institutional arrangement, comprising property rights system and transaction costs (Williamson 2000) which are focused on the governance of managing and regulating transactions/interactions within a social-ecological system.

Table 1. Sabah’s de facto diverse property rights system of Country Lease (CL) and Native Title (NT) POS governance.

Property-Rights System	CL POS			NT POS
Title-ship of POS (Issuance of title deed)	(Title deed is granted on POS) (Involving POS site handing over and POS title deed transfer)			(No title deed issuance on POS)
Status of transfer and site handing over of POS	First phase CL POS (Before title deed issuance)	Second phase CL POS (Before title deed issuance: Interim)	Third phase CL POS (Title deed issued)	Surrendered POS (State land) (Without involving site handing over/title transfer)
	(Un-transferred title) (Un-handed over site) (Held under owner’s covenant)	(Un-transferred title) (Handed over site) (‘Bare Trustee’) **	(Transferred title) (Handed over site)	
Land ownership	Private/Common property-developer/owners	State property-Local government (As an equitable owner)	State property-Local government (As a legal owner)	State property-Local government (As an equitable owner)
Management regime (including monitoring, maintaining, control, etc.)	Private/Common Property-(Developer/Co-landowner(s)) (Temporary—e.g., minimum 18 months)	State property-Local Government or Local government + Common property/community association-residents (registered) *		Open-access resource (without being vested in the local council)
Positions: Bundle of rights	Claimant: Only access, use and management rights are clearly and actively possessed by subdivider(s) and local government			Authorised users: Public users with use and access rights
Access	Yes			Yes
Withdrawal/use	Yes			Yes
Management	Yes			None
Exclusion	None			None
Alienation (e.g., POS disposal, title deed transfer)	The title deed is only transferable to the local council by private titleholder(s)			Not transferable

* Only certain districts and neighbourhoods adopt the regime on some POS (optional). ** After fulfilling the owners’ covenants, the subdivider becomes a bare trustee who is divested of his equitable rights/interest on the POS, except a non-active duty i.e., executing POS title transfer registration to the council. Source: [Ling and Leng \(2018\)](#) and [Ling et al. \(2016\)](#).

3.2. Transaction Costs

There are numerous definitions and explanations of transaction costs (see [North 1991](#); [Webster and Lai 2003](#); [Ling 2019b](#)). However, they rudimentarily cover market and non-market transaction costs for both ex-ante and ex-post contracts, namely costs of organising, negotiating, operating, managing, monitoring, supervising, legal fees, cooperation, information searching, predicting and imposing contractual relations, as well as costs of lobbying and queuing. In short, transaction costs are any event/activity costs involved within an environment impeding a transaction from taking place or a contract or operation to be enforced. Hence, it is crucial to analyse and determine the distribution and level of transactions costs, to evaluate and understand the efficiency and performance of an existing institutional system ([Ling 2019b](#)). As [Musole \(2009\)](#) posits, incurring lower (negative) transaction costs is vital for, and can benefit to, an SES, especially relating to the operation and enforcement of a transaction. Lower or negative transaction costs encourage more transactions and exchanges; enable property rights system definition and its enforcement/implementation; and enhance the production. However, it is not necessarily true to entail that the mere presence of high (positive) transaction costs may adversely undermine the above transactions, production and enforcement, and subsequently bring about negative outcomes ([Musole 2009](#)). In addition, it is worth noting that transaction costs do not necessarily need to always be measured in an absolute pecuniary term (dollar and cent) via the objectivist approach; they too can be addressed using the institutional/subjectivist approach in qualitative proxies, which focus on the degree of burden, efforts and the amount of time incurred during the transaction, including uncertainty and risks, as well as likelihood of social/commons dilemmas and opportunism. That means this relative approach/mechanism appears to be handy and appropriate in a situation where data and information are not always available; it at least enables individuals to make a decision via comparison and estimation between different scenarios using the above elements. For example, one can easily determine under which conditions contribute to lower risk and uncertainty or have higher probability of opportunistic behaviour and social dilemmas occurrence, comparing with other circumstances. Hence, in this paper, this subjectivist approach is more relevant to be applied in analysing the institutional-social-POS system.

3.3. Property Rights System

There are two principal components within a property rights structure/system (or institutions—the two terms are used synonymously in our paper), namely property rights regimes and property rights ([Ling 2019a](#)). The latter comprise an economic rights bundle, where the legality of economic rights is in question ([Heltberg 2002](#)). Following the essence of the institutions above, legal/de jure rights are the rights allocated and recognised/supported by governmental authorities and are governed and enforced by laws. These formal and legal rights are vital to protect and substantiate the economic rights; the former ensures the latter is not being disputed. Economic rights are the ability or claim of individuals to use their rights and interest over a resource. These rights are deemed as a bundle of sticks, with each stick representing a right that provides individuals with a stream of benefits (e.g., ownership, use, exclusion, alienation and management) and their respective positions (e.g., users only have access and use rights) ([Schlager and Ostrom 1992](#)). Exchanging of economic property rights, through property development (e.g., land subdivision) and dealings (conveyance of rights) among individuals are a form of a contractual agreement ([Ling et al. 2016](#)). In addition, [Buck \(1998\)](#) maintains that the bundle of property rights is shaped and attributed by types of property regimes (ownerships); different types of regimes provide the unique assignment of property rights. Similarly, attribution of right bundles can influence and contribute to a different property regime.

There are four main categories of property rights regimes, including private property, common property, state property and open-access resource. However, in reality, those regimes are mixed (see [Ling et al.'s \(2016\)](#) discussion on the property rights system on POS governance in which both de jure and de facto property rights as well as different regimes co-exist under the practice). Each

property regime associated with its own features, potentials, and drawbacks ensues in different resource governance implications regarding the type of economic goods and quality outcomes (see Ling 2017).

Apart from economic performance, the literature also shows the significant roles and effects of property rights systems and transaction cost distribution on SES and commons efficiency and sustainability outcomes (Ostrom 1990; Webster 2007; Boydell and Searle 2014). See also Ling et al. (2016) for statistical associations between Sabah’s property rights system and POS quality. For more grounded explanation, Grafton (2000) argued that property rights are fundamental to understanding and explaining the overexploitation issues of the environment because ultimately the problems boil down to market-ecological behaviour. Adopting Demsetz’s (1967) classic property theory emphasising the pivotal roles of institutions for externalities internalisation, it is believed that different alignments and arrangements of the property rights structure influence (perverse) incentives and transaction costs distribution, therefore shaping stakeholders’ behaviour of management and consumption and consequently leading to different outcomes in terms of the allocation and sustainability of resources (Ling 2019a). For example, within a maladaptively designed property rights structure where the spatial and land use planning policy is poorly enforced, it is likely to cause high perverse incentive and high transaction (enforcement) cost which may contribute to inefficient market-ecological outcomes (Musole 2009).

Based on the discussions above, there are interrelationships founded between property rights systems, distribution of (perverse) incentives and transaction costs, and the market-ecological outcome. Thus, a theoretical framework (Figure 1) below is constructed and served as an underpinning to succinctly illustrate interactions of institutional (property rights and transaction costs)-social dimensions in the context of a common resource (i.e., POS).

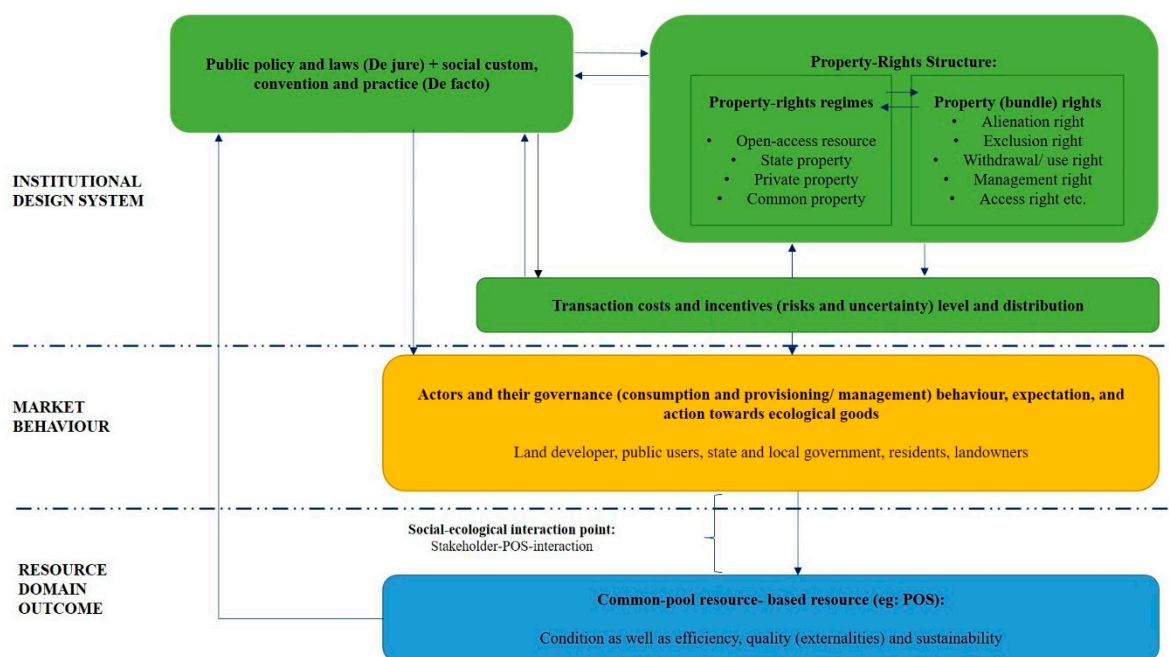


Figure 1. Interplay between institutional property right structure, transaction costs and incentives, stakeholders’ behaviour and public open space (POS) outcome (adapted from Ling et al. 2016).

4. A Social-Ecological System-Based New Institutional Economics Conceptual Framework

The above theoretical framework only offers the overall background of the NIE components and their functions covered by the institutional-social-ecological system, whilst this section further extends the review by identifying types of institutional tragedies/issues discovered in a governance system and discussing their potential impacts contributing to adversarial social-POS behavioural interaction and its performance outcome. By integrating other theories and concepts of NIE, namely opportunism

and social/commons dilemmas, into an SES, it specifically addresses the subsequent questions: (i) what types of institutional problems and changes are usually found in an institution; and (ii) why and the ways these institutional failures trigger the opportunistic behaviour of actors and result in inefficient commons governance (management and use) and therefore the suboptimal quality outcome of rural POS.

4.1. Concepts of Opportunistic Behaviour (Opportunism)

Since institutional systems and market behaviours are fundamentally interrelated, the issue of human behaviour, whether one behaves self-centredly, is highlighted, especially regarding social-ecological (POS) decision making. The concept of self-interest suggests that individuals are invariably acting selfishly and rationally by maximising their interest (advantages), and there two forms of self-interests discovered: (i) defective self-interest and (ii) enlightened self-interest (positive externalities). In this paper, the former is predominately entailed. Besides, the concept of opportunism deriving from self-interest is required in the discussion, to offer a more instrumental and pragmatic understanding of social-ecological behaviour (Williamson 1975).

Williamson (1975) posited that when individuals act opportunistically, they seek to pursue their maximum interests, and such behaviour may subsequently lead to breaking the rules/contract. In his words, opportunism is “... to include self-interest seeking with guile.” Guile here includes rules and promise breaking, breach of contract, as well as withholding or distorting information. Individuals cannot always be assumed to honour their agreement by performing their duties/rights (symmetric commitment), albeit a list of specific and clear terms and conditions have been concurred earlier during the ex-ante. They may behave deceptively after the contract (ex-post opportunism), by involving oneself in moral hazards, shirking and free-riding, and overexploitation (see social dilemmas) (Ling 2019a). Opportunism has a central role in transaction cost economics, especially in this institutional-social-POS context; opportunistic behaviour increases transaction costs. For example, weak and poorly enforced institutions cause high transaction costs and opportunism risks, ensuing in negative externalities and detrimental impacts on the efficiency of the ecological system.

4.2. Commons Dilemmas and Negative Externalities in Rural Neighbourhood POS

Self-interest and opportunism are the underlying components of social dilemmas and are associated with them (latter). A social dilemma is when a dilemmatic decision-making condition is met; individual's level of intent and motive to maximise private (self-interested) gains and welfare (convenience and enjoyment/utility) is different from his/her motive to maximise collective interests (Rapoport 1998). The propensity to maximise one's interest is considered to be a defecting option (which is a dominant and prevalent strategy), while the tendency to maximise the gain of the collective interest is deemed as a cooperative choice. Individuals inevitably receive higher gains, at least in the short term, when they behave opportunistically by making a defecting choice. This situation can be further illustrated in the game theory/prisoner's dilemma. There are two types of social dilemmas: public goods (giving) dilemma and resource (taking) dilemmas, and they are both considered or known as CPR/commons dilemmas, because the aspects of contribution (management) and consumption (appropriation) are concerned in common resources.

In the context of rural POS, below are some potential commons dilemmas faced (see Ling 2019a): (a) shirking (individuals avoid the assigned duties, e.g., no development, mismanagement, underinvestment and less monitoring, or paying tax), (b) free-riding (individuals, e.g., squatters and outsiders who benefit the services without paying any or equivalent tax and fees), (c) moral hazard (individuals are not incentivised to guard against or manage a risk when other agents/governments protect against it), (d) overexploitation (individuals maximise their advantages and interest via consumption or access rights, e.g., POS misuse or illegal conversion of land, overcrowded/congestion

may occur) (see [Hardin 1968](#))³, (e) disuse (authorities abandon or discontinue the use of resources), (f) commons underuse (it is opposite of overexploitation, where its effect may potentially lead to other commons dilemmas) ([Baur and Nax 2018](#); [Miyanaga and Shimada 2018](#)), and lastly (g) private exclusion of resources for personal purpose compromising the collective welfare.

The above POS dilemmas will be exacerbated if more opportunistic behaviours and the number of users (competition) increase; they result in other dilemmas, and thus more social costs will ensue. This phenomenon can be relevantly illustrated in [Wilson and Kelling's \(1982\)](#) broken windows theory whose work is applicable to a neighbourhood context, i.e., trivial and little issues and dilemmas left ungoverned and unmonitored may lead to more serious problems. For instance, shirking of POS management and maintenance (paper parks), contributing to poor cleanliness and landscaping issues and vandalism may cause more severe forms of overexploitation, such as free-riding and misuse/use conversion of POS which subsequently subject the neighbourhood to severe safety and security and total inaccessibility issues. Both self-interest or opportunism triggered CPR POS dilemmas are influenced by various environments that surround them ([Ostrom 2009](#); [Ling 2019a](#)). Thus, in this paper, the environment here signifies the design of an institutional system, including the impacts of local property rights failures on social-ecological opportunistic behavioural interaction.

4.3. Implication of Property Rights Failures on POS Governance and Quality

Within an SES, numerous property rights structure failures are usually discovered, perversely incentivising stakeholders to act opportunistically and thus cause commons dilemmas and social costs. The property failures/tragedies include security/stability of rights ([Lu and Xie 2018](#)), conflict between de facto and de jure right ([Schlager and Ostrom 1992](#)), definition and clarity (absence) of rights ([Coase 1960](#); [Kaiser et al. 2018](#)), incompleteness of rights ([Williamson 2000](#); [Webster et al. 2016](#)), attenuation of rights ([Furubotn and Pejovich 1972](#)); adaptiveness/suitability (mismatched) of property rights assignment ([Webster and Lai 2003](#)), and de facto rights emergence ([Schlager and Ostrom 1992](#)). Below are the discussions of how each property rights tragedy occurs.

4.3.1. Attention (Robustness and Strength) of Property Rights

According to [Furubotn and Pejovich \(1972\)](#), attenuation of private right can weaken the exclusive private property rights of the owner through the state's restrictive measures, such as freedom of utilisation, alienation, exclusivity, tenure duration, or constructability on resources. This situation can lead to over-exploitation and shirking ([Frech 1976](#)). Over-exploitation occurs when weaker rights reduce the price for non-pecuniary amenities, like POS in this case, leading to greater consumption of them with lower firm wealth. Simultaneously, this reduces managerial efficiency and increases production costs. Besides, shirking and underinvestment issues occur when attenuated rights reduce the gains of the assets. With the restriction of rights, those lower-value assets cannot coincide with the low gains when investments are made. This situation is in line with [Webster and Lai's \(2003\)](#) contention, which states that property rights attenuation can encourage opportunistic developers and owners to act illegally by evading regulation, shirking, and bribing/lobbying.

4.3.2. Incompleteness (Uncertainty) of Property Rights

Well-defined property rights are the regime of a property which is precisely determined. Their restrictions that bind the resources, duties, and rights are transferable ([Lu and Xie 2018](#)). However, well-defined rights do not necessarily and always connote 'complete' rights ([Nicita et al. 2007](#)). "An

³ "As a result of ambiguous and ill-defined property rights, it is a phenomenon where different self-interested individuals are granted with unrestricted consumption and access rights (freedom) to the given open-access resource (pasture) without any cost-effective mechanism to monitor, manage and regulate others' uses; therefore, the rivalrous CPR resource is vulnerable to overuse that results in resource degradation and depletion" ([Ling 2019a](#)).

incomplete contract has gaps, missing provisions, and ambiguities and has to be completed (by renegotiation or by the courts ..." (Hart 1995). In this regard, there will be non-contractible rights due to difficulties in contemplating in all possible contingencies (Kim and Mahoney 2005). To add, incomplete rights contain non-contractible elements that increase ex-post costs and perverse incentives (opportunistic behaviour). When the rights enforcement is not guaranteed, the property value diminishes as the expected income and utility of the assets lessen; properties with incomplete rights are exposed to over-exploitation, free-riding, underinvestment, and shirking (Williamson 2000; Kaiser et al. 2018). For example, the ambiguity of POS maintenance and management rights in terms of 'how and when' causes some opportunistic managers and landowners to mismanage and underinvest in POS; overlapping management rights between landowners and local government opens up the risk of moral hazard against the latter (Ling 2017). Unclear use rights in respect of operational procedures and guidelines of POS facilities and amenities may also lead users to overexploitation (e.g., vandalism and cleanliness issues).

4.3.3. Mal-Assignment of Property Rights

Another form of property rights failure is misallocated rights within the unfeasible property regime, which are also known as resources misallocation. The mal-assignment of property rights regime affects the efficiency of property rights. The point is to what extent the resources interaction and the outcome are efficiently governed under the current property rights regime (Webster and Lai 2003). The resources should be allocated to those organisations and agents who are in the most suitable position to govern and manage the resource contribution to the desired and efficient outcome. Generally, this can also cover other types of property rights tragedies (e.g., incomplete right and attenuated right) above, as those rights tragedies may ultimately contribute to similar negative externalities as the misallocated rights. However, it is worth remarking that, although the institutions are not attenuated or have been fully well-defined and secured as per the description above, it does not suffice to signify the adaptiveness of a property regime in governing the resources (POS) management and consumption. This situation (occurrence of paper parks) is true, especially when various positive ex-post costs (such as political influence, rent-seeking, lobbying and bureaucratic issue, financial budgetary and heavily centralised information, sole monopolisation, low precedence on non-pecuniary POS compared to economic goal, overwhelming workload, technicalities and workforce constraints) are incurred and are failed to be internalised under a state property regime in this case. Therefore, due to high cooperation and negotiation costs in enforcing the management rights, it causes inability and burdens, and perverse incentives to the rights holders who then may likely act opportunistically on POS (Foster and Iaione 2016; Musole 2009).

4.3.4. Insecurity of Property Rights

Property rights security is mainly defined by property rights enforceability and is regarded as the extent to which ones' rights to resources are acknowledged and secured with respect to legitimacy against specific challenges. In other words, rights security entails the sense of permanence and stability (Kim 2004). Implicationally, individuals with insecure tenure are exposing themselves to the conflicting claims of interest/rights and even lost owing to dispossession. Such insecure property rights issue may hinder land dealings and investment (Kim 2004), which is ultimately linked to the poor land use and environmental degradation.

Besides, the effects of legal title deed possession via land registration and the perceptions of stakeholders on the security of property rights (e.g., untitled land such as ancestral or family inheritance land) are considered too. Title insurance (as entitlement and evidence) is another mechanism used to reduce the risk of successful challenges to ownership of land. That is, via the formal registration and possession of the title in a cadastral system, it increases the security of ownership, its value, and production and investment over resources (Feder 1988). A title deed does not only give security of legal sense and recognition of tenure; it, however, gives some impact on the owner's perception

and the concept of their tenure security. That means titleholders may feel more confident about their ownership of the resource as insured, unchallengeable, tangible and guaranteed with no risk of resource dispossession (Payne et al. 2009). Hence, this incentivises them to be more willing and responsible to the provision and investment in the resource, which increases its value, quality and productivity (Galiani and Schargrodsky 2010; Pinckney and Kimuyu 1994).

Apropos, this perceptual security issue on titling and registration arises probably due to a poorly designed land titling system, e.g., ambiguities within a title which cannot de facto render a sense of security (legally) to de jure non-titleholder(s). Here are some findings suggesting that by possessing the asset's title deed, it can give their extra security perceptively (Food and Agriculture Organisation FOA). As Payne et al. (2009) corroborated, in the sense of title deed possession, "... tenure security is not just a matter of legal or illegal, formal or informal status; security is a relative concept and a matter of perception ...". However, some studies also showed that land titling showed no significant impact of the land titling on resource outcomes, i.e., although there is a formal title to land, it may not increase efficiency. This phenomenon is also supported by Ling et al. (2016) and Ling (2017) that a title deed possessed by both private suppliers and government, respectively, on a public domain resource may not yield desired quality of public space due to other rights issues, e.g., attenuated and maladaptive rights might downplay the beneficial impact of the titling system. Moreover, at times, an untitled property, e.g., untitled inheritance or family land, may surprisingly render another form of security sense. As Chirwa (2008) argued, once an untitled customary, ancestral land (especially recognised by the government) has been allocated to the family or lineage under the customary tenure, the land is frequently perceived as the property of the family in perpetuity. As Payne et al. (2009) mentioned, the tenure of land security is not necessarily derived whether from the legal or formal perspective; rather, perception plays an important role too. As Kim (2004) asserted "*perception of security ... exerts a greater degree of influence ... rather than the provision of titles per se.*"

4.3.5. Conflict between de Facto Property Rights with the de Jure Rights System

As discussed, there are two types of institutions: formal (de jure) and informal (de facto) constraints and rights systems (Food and Agriculture Organisation FOA; Schlager and Ostrom 1992). Rights holders who enjoy de jure rights presume that if their rights are disputed, their rights would be sustained. In contrast, de facto rights may not be a given similar recognition in the court of law if they are challenged, because they are less secure than de jure rights. However, unless the de facto regime is challenged, it is as much a factor as de jure rights that affect actions (Schlager and Ostrom 1992). De facto informal property rights usually contravene the de jure, formal status of rights ensuing in negative social-ecological interaction externalities and sub-optimal commons outcomes. This section is closely related to the above security of rights issue because despite the fact that the former has been de jure, formally secured, it still could be associated with the plights of de facto and informal property-rights emergence, particularly on the perceptual issue of title deed possession by both governments and private supplier(s) and customary ancestral land (Ling 2017).

Typically, the tenure of the non-formal de facto customary regime is associated with indigenous communities according to their customs as opposed to statutory or legal tenure. In a local society, much legitimacy can be enjoyed within the evolving customary rights systems. In the rural areas of the non-Western world, it is the customary rights that give individuals the sense of legitimate property rights on their land (see the Aboriginal Peoples Act 1954; the Sabah Land Ordinance 1930). Additionally, a challenging circumstance can take place when the informal and customary features are not considered within the formal institutions. That being said, a conflict may arise between the adoption of informal/de facto perceptual security rights and the customary ancestral rights with maladaptive formal institutions (Food and Agriculture Organisation FOA). Other than its illegality or informality issue, individuals may opportunistically opt to dwell within the informal unrestrained rights regime and self-perceived informal rights (Alston et al. 2009), with no or fewer restrictions prescription which consequently ensues in resource overexploitation.

Succinctly, the property rights failures above are intricately interrelated to each other, which respectively contribute to its specific commons dilemmas and negative externalities. More precisely, negative externalities or dilemmas will be worsened if those rights issues (e.g., incompleteness and attenuation as well as maladaptive rights) have co-occurred simultaneously, which this phenomenon is typically discovered in one institution. Finally, taking the above theoretical framework into consideration, a conceptual framework was formulated (Figure 2). This framework based on the transformative design (see Creswell and Clark 2007) subsequently helps provide a clear orientation to the methodological design, essentially justifying the selection of study areas and clarifying types of data, number of variables and parameters, and analysis techniques required in addressing this study's research questions.

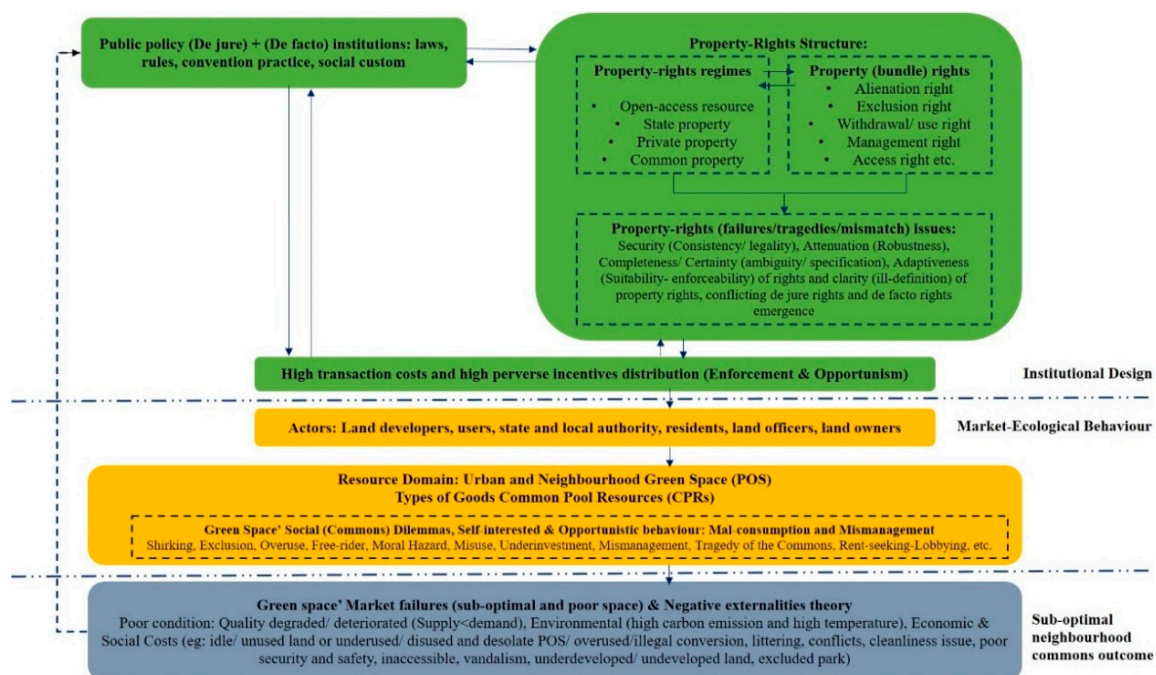


Figure 2. A conceptual framework on diverse property-rights issues and high transaction costs contributing to opportunistic social-POS dilemmas and negative externalities.

5. Methodology

5.1. Study Area

Spanning 25 districts and one federal territory, Sabah, as the easternmost state (73,631 km² land area) of Malaysia, with an approximate population of 3.87 million people, is recognised as a multi-attribute state (Department of Statistics Malaysia 2017). In general, it is ethnically and culturally diverse, with more than 60% 'Bumiputera' or natives (aborigines) including Malay, Kadazan, Bajau, Dusun and so on, and the rest are Chinese and Non-Malaysian (Filipinos) (Ling et al. 2016). However, only the following were selected as the study areas (Figure 3): the Kota Kinabalu district, as the capital city located on the northwest coast of Borneo facing the South China Sea, with an area of 351 km² and population of 0.63 million (in 2012), governed under the Kota Kinabalu City Hall and the Penampang district, southerly adjacent with Kota Kinabalu, with an area of 463.47 km² and population of 121,934 in 2010, with Native Kadazan making up the majority, governed under the Penampang District Council. Figure 3 is the map of the two study areas, displaying their geographical locations, territorial coverage, and clear boundaries of the districts. Taking into account the concern of data availability, and better representativeness of the data sample, of both Country Lease (CL) and Native Title (NT) POS, instead of focusing on one district alone, namely Kota Kinabalu due to its city-level status, the above two

districts were chosen simultaneously, offering a more holistic picture and understanding of local POS governance and management issues resulting from the diverse and unique property rights system. Specifically, owing to the large, adequate dataset of CL POS and data unavailability of NT POS in the capital city, Kota Kinabalu, CL POS and NT POS data samples were mainly obtained from the Kota Kinabalu and Penampang districts, respectively. As of 2014, about 350 CL POS and 22 NT POS were discovered in Kota Kinabalu and Penampang, respectively (see Ling et al. 2016; Ling 2017). Although there are a number of CL POS in the Penampang district, its population is not mentioned and sampled in this study; CL POS have been adequately covered by the Kota Kinabalu district, and more importantly, the same institutional property rights system of CL and NT POS governance of the latter is uniformly applied to other 24 districts. In addition, residential land use becomes the sole focus instead of other types of land uses, such as agricultural and commercial, because the former is considered as the largest land use; thus, it is possible that ample POS are created in this land category (Ling et al. 2016).

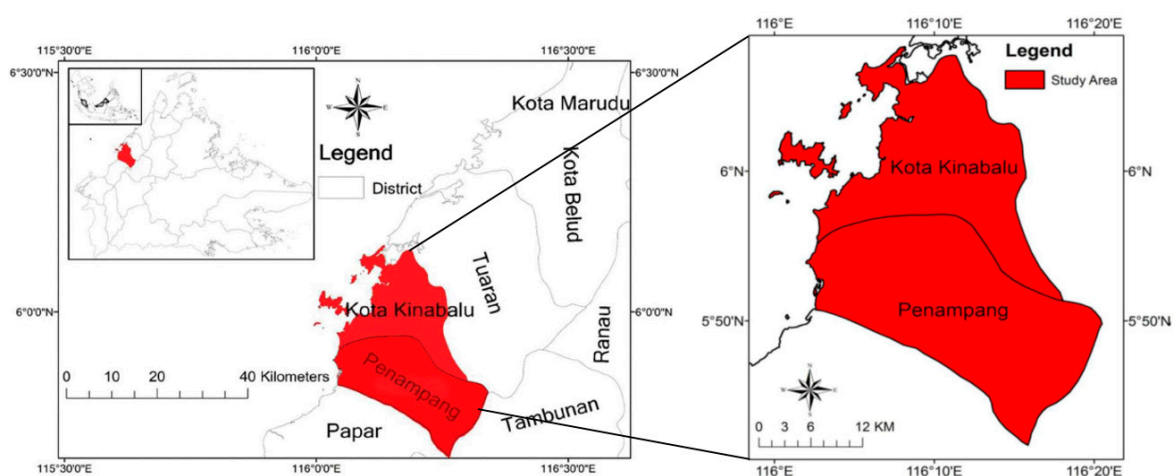


Figure 3. A map showing Kota Kinabalu and Penampang districts, Sabah, Malaysia (Ling et al. 2016).

5.2. Sabah's Land and Planning Systems on Residential POS Property Rights Distributions

In regard to the local residential Country Lease (CL) of Country Land and Native Title (NT) of customary Native Land, in the context of landed, non-gated-and-guarded residential property, both the CL and NT neighbourhood POS governance systems are mainly governed by Article 13 of the Federal Constitution which emphasises that no one shall be deprived of property (i.e., the title deed of land), although the land subdivision process requires the surrender of the original land title deed to the land office, and Sections 38 and 40 of the Sabah Land Ordinance (SLO) Cap 68 on land surrender and subdivision procedures. Pursuant to Sections 54 and 64 of the SLO Cap 68, Country Land and Native Land are considered as rural land because they are outside of the town area boundary (see Section 4 of the SLO); the residential use is allowed in, and mostly fall under, Country Land and Native Land, although the land use of the above lands is primarily meant for agricultural purposes (see Sections 70(2), 54 and Rule 23 of the SLO for the category of use conversion).

In light of the above laws, when land subdivision (a development process portioning a piece of land that exceed one acre into several parcels) is executed by either an individual owner (a developer or landowner) or co-proprietors for either Country Land or Native Land, in an approved scheme, pursuant to Section 25(2)(q), 28D, and the Third Schedule of Part 4(1) of the Town and Country Planning Ordinance Cap 141, at least 10% of (public) open space should be specifically zoned and set aside. As for Country Land subdivision, Country Lease (CL) including its POS is alienated with a title deed but in the form of a lease (not exceeding 99-year lease of tenure) (Section 48 of the SLO), where both non-native and native of the state can own this type of land by having the title deeds. While, as for Native Land subdivision, fulfilling the 10% POS provision requirement, no title deed is issued to the

native title (NT) of POS⁴, and such NT POS can only be held by natives (Sections 17 and 64 of the SLO) perpetually (no expiration of term) (see Section 66 of the SLO on the permanency of NT customary tenure). Such untitled NT POS is regarded as State Land (see Sections 4 and 5 that such land is reserved for public purpose and shall be vested in the State Government).

Besides, there are other principal Ordinances and judicial decisions of case laws⁵ related to POS provision and governance in terms of ownership, management and consumption rights and duties, including the Modified Torrens System on the concept of bare trustee (see FAQ Sabah Land, 2009; Section 88 of the SLO on the need of title deed registration for validity), Sections 38(1), 49(1)(53), and 49A of the Local Government Ordinance 1961, Section 25(2)(q) of the Town and Country Planning Ordinance Cap 141, statutory local plans and development plans, and the Housing Development Enactment 1978. Generally, the titling system on POS (i.e., issuance of a title deed for CL POS and no title deed for NT POS) is more of a de facto or self-enforced practice, rather than espousing the above de jure/codified system. More specifically, such practice⁶ (de facto system) is formally perceived and construed to be consistent with the above de jure system (see Ling et al. 2016; Ling 2017 on such mixed institutions; see also FAO, 2002 that at times formality and legality can be used interchangeably)⁷.

Such practice was formally introduced in 1995 via the letter of offer (see Sections 29 of the SLO Cap 68), another document stipulating terms and conditions and owners' covenants of POS development that consequently form an agreement or contract between the government and Country Land subdividers (owners) (Ling et al. 2016). In the letter, the four key terms and conditions are (i) the said land is demised herein expressly and only for the purpose of open space; (ii) subdivision of this title (POS) is prohibited; (iii) transfer, sublease or charge of this title is prohibited except to the relevant Authority or the title may be surrendered to the State Government after the fulfilment of the owner covenants (Ling et al. 2016). The owner covenants here refer to development and maintenance of the POS within the stipulated time, e.g., at least 18 months in accordance with the approved development and landscape plans/satisfaction of local authority (Ling et al. 2016). Failing to do so may subject the subdivider(s) to the sanctions enforced under the SLO Cap 68 (see Sections 34 and 171A) and the Housing Development Enactment 1978 (Ling et al. 2016).

As a matter of fact, both POS have their respective terms and conditions, but more complex terms and conditions and owners' covenants were imposed on CL POS, compared to NT POS. The NT POS system is more straightforward and is plainly described, since it has no title deed issuance; hence, phases like CL POS' title transfer and site handing over covenants are not involved. Since the un-titled NT POS is surrendered to the state authority, its ownership is in principle held as state land and hence, a state property (government property), in which the local government will be the equitable owner for NT POS. Consequently, the management duty should de jure be held by the government (local council) (see Section 38(1) of the Local Government Ordinance) (Ling et al. 2016). However, such de jure procedure may not practically be implemented; there are issues whereby the gazetting and vesting procedures involving the efficient communication between state government and local government are not performed (see the case of Sabindo Nusantara Sdn Bhd and Anor v Majlis Perbandaran Tawau and Ors (2011) 8 MLJ 653). Therefore, although the land ownership is held as state property where there is no legal and recognised management right vested in the local council, the POS management regime or the maintenance duty is formally and de facto being held as an open-access resource or is

⁴ Based on the local practice of property rights, aside from titled CL POS, the titleship system for NT POS is quite unique as only NT POS will not be granted with any title deed, while other land uses under Native Land (e.g., house and agriculture), titles will be granted to individuals (see Section 67(1) and (2) of the SLO Cap 68).

⁵ Sabindo Nusantara Sdn Bhd and Anor V Majlis Perbandaran Tawau and Ors, S. 2011. 8 MLJ 653. See also Borneo Housing Mortgage Finance Berhad V Time Engineering Berhad. 1996. 2 CLJ.

⁶ This practice has been enforced by the Director of the Lands and Surveys Department of Kota Kinabalu (as headquarters); hence, it applies to all other districts within the State of Sabah.

⁷ Despite the government's practice/house rules and conventions, which may be deemed formal, they may not be necessarily legal/de jure (following the provisions of laws) (Ling et al. 2016).

left ungoverned, and in this scenario, the local government is considered as a user (with use and access rights), rather than as a claimant.

While, there are three phases of the process for the CL POS system, starting from (i) un-transferred POS title deed and un-handed over POS site for the title deed which has not been issued, in which the subdivider(s), who is the legal and equitable owner, is mandatorily subject to the temporary (18-month) owners covenants; then (ii) the interim phase involving un-transferred title but with handed over POS site. Within this phase, only after the fulfilment or satisfaction of the above owner's covenants, where the permissible site handing over coupled with a registrable memorandum of transfer, are executed, the subdivider(s) (title holder), who is a bare trustee, is officially considered relinquished of his active ownership and management rights of the space to the local authority (equitable owner). However, the subdivider(s) is still a legal owner as the title deed is not even transferred, or the private subdivider's name is still within the POS title deed. Within the scope of the bare trustee concept, the equitable rights are more crucial in the sense that they outweigh and prevail over the legal rights (Ling et al. 2016); the active and actual rights are already assigned to the government when the POS site is handed over. Whether the title transfer is executed or not, it does not really matter because during this phase, the management duty has been identified.

However, if the equitable local government claim priority by 'substantiating' and strengthening its interest or rights on the POS for becoming a legal landowner, then the registration of transfer should take place (see Section 88 of the SLO that "... *valid until it is registered* ..."). Note that this second phase of the interim/temporal mechanism of site handing over is to address the problems of late issuance of title deed that normally takes years due to government bureaucracy. More vitally, it is to ensure that the POS management and maintenance duty is continually resumed by the local government. After fulfilling the minimum 18-month owner's covenants, the subdividers will normally choose to transfer or hand over their management and maintenance duties of POS to the government because they do not want to bear further costs of maintenance. This measure is necessary as the local authority should be the ultimate equitable owner and manager of the POS (see the above provisions of the Local Government Ordinance). However, private suppliers may retain maintenance duties for 2 years or more as long as they maintain it for their sake of marketing/reputation benefits; this is allowable since handing over or transfer is not legally deemed compulsory (Ling et al. 2016).

Additionally, it is also noted that in particular neighbourhoods, the POS management duty can optionally be shared among the community or residents who live nearby (Ling 2019b). That is, there are some neighbourhoods engaged in such cooperation with local authority (Ling et al. 2016). For instance, some POS are managed by two cooperative entities—the local government and community—or managed by one entity—the local council only. For the former, any residents can voluntarily form a committee and act as a neighbourhood watch. The committee should consist of approximately 10 members, including the president (as a leader), vice president, secretary, treasurer, coordinators and other members via registration, to 'partially' assist the local council in POS management (Ling et al. 2016). Duties encompass monitoring and ensuring the safety, security, cleanliness, and condition of amenities/facilities of the POS. The committee is not directly involved in maintaining the facilities and amenities of the park; rather, they just act as co-manager or assistant to the local government who is the main (maintainer) and custodian of CL POS (see Ling et al. 2016; Ling 2019b). The above scenario which forms agreement between a group of residents and the local authority is likened to a contract. If any vandalism or safety and security issues arise, the community association may report these issues to the council and be called upon for government meetings to raise their current needs and problems. In practice, one committee typically is in charge of more than one neighbourhood. On average, one committee could be responsible for three to five neighbourhoods in which one neighbourhood may consist of more than one POS. In the district of Kota Kinabalu, Sabah, only 30 committees were formed to oversee more than 100 *tamans* (neighbourhoods), some of which are inactive in exercising their duty (see Ling et al. 2016). If the particular neighbourhood perform their work effectively, a non-monetary prize or an award will be conferred upon them by the local government (Ling 2017).

Finally, in the last phase of the process (iii), when the title deed of POS is issued by the land office, the previously handed-over POS title should be transferred to the local government. If the title deed is successfully transferred via registration, the equitable local government becomes the legitimate owner and manager of the POS where some rules that applied to the private suppliers in the first phase of the CL POS is extended to the local government (Ling et al. 2016). For example, no further alienation or transfer is executable by the government, and the space must remain shared (for public purpose), unexclusive, and unchanged in terms of its purpose (i.e., no conversion, subdivision or other types of misuse (developments) are allowed on POS). Until 2010, about 63% (190 POS) were not yet transferred to the local authority as the signed memorandum of transfer was not submitted to the land office for registration (Ling et al. 2016; Ling 2017). In fact, only the transferred POS titles are entitled to specially be funded by the federal government's initiative, via the Ministry of Youth and Sports with extra allocation to upgrade its quality (Ling 2017). Upgrades include redeveloping the facilities, such as the old futsal, basketball court into a better and more equipped facility. Additionally, the management regime is similar to the previous phase (handed-over site but un-transferred CL POS title), whereby the non-obligatory co-management regime between local residents (community association) and the local government is allowable. To sum, the CL POS rights distribution, in spite of the slight differences within its transitional process, all the owners (both private subdividers and local government) are considered claimants because the main and active rights that are engaged are management, consumption and access rights (Ling et al. 2016).

Apart from the titled CL POS with three composite phases of rights distribution and the un-titled state-owned NT POS, which are fleshed out in Ling's (2017) thesis and Ling et al.'s (2016) paper, to sum, both CL POS and NT POS are open for public access. In addition, particularly for CL POS, since the owners (either private subdivider or ultimately local government), regardless of the interim period and the transitioning period, eventually own clear access, withdrawal/use and management rights, they are regarded as claimants. To have better understanding of the above discussions, Table 1 below provides a succinct picture of the diverse and complex property rights distributions of CL and NT POS governance in terms of ownership regime, alienation, consumption, exclusion, and access rights, which are influenced by the above de facto/practice-based POS system (mixed institutions), via the title deed issuance (titleship), community association presence, and status of POS site handing over and transfer of POS title deed. The rationale of the above discussion and the table is vital to understand whether and how these current institutions and property rights heterogeneities, under different phases and types of lands, taken as core exogenous variables, affect and shape the well-being and quality of local CL and NT POS, particularly from the social-ecological behavioural interaction perspective. Lastly, by reviewing the local de facto institutions on POS governance, it is found that this local institutional design resembles and satisfies the above theoretical position on the institutional effects and relationships between institutional environment (laws) and institutional arrangements (property rights distribution) (see Williamson 2000).

5.3. Respondents Sampling

Twelve public officials, eight private suppliers, and 200 public users (residents) participated in this study. Those 12 officials worked in the Lands and Surveys Department and the City Hall of Kota Kinabalu and the local council of Penampang. While in the private sector, there were 156 registered developers in 2014 (Sabah Housing and Real Estate Developers Association SHARED), but only eight private suppliers/developers were selected for the face-to-face semi-structured interviews because they had vast experiences in handling residential development and construction projects and knowledge about the sub-division of land and POS provision and governance under the current local practice. To obtain responses (perceptions) of public users (residents), a mixed-method sampling was adopted. Since there were about 150 neighbourhoods in 10 zones amounting to approximately 350 CL POS and

22 NT POS for both districts (Ling 2017), only two neighbourhoods were selected from each zone through randomisation, with a total of 200⁸ respondents participating in this study.

5.4. Methods and Procedures

Based on the sequential transformative (embedded) mixed-method design⁹, a combination of phenomenological case study and questionnaire survey research strategies was employed. That is, initially, eight public officials from the Lands and Surveys Department and the Kota Kinabalu City Hall were interviewed face-to-face via semi-structured interviews, while the other four from the Penampang local council were invited to take part in a focus group discussion. To ensure overall credibility and reliability of the qualitative results obtained from the respondents, content validity and face validity on the instruments (interview questions) were performed also. Subsequently, self-administered questionnaires to 200 residents were carried out, comprising 46 questions (items) with five sections, which included: (a) demographic details (labelled under the A items); (b) intention and frequency to visit or use POS (labelled under the B items); (c) POS quality levels under the current practice/property rights structure (labelled under the C items); (d) the perceptions of residents in the current POS governance and consumption behaviour (labelled under the D items); and (e) possible recommendations for better POS quality (see the sample questionnaire in the Supplementary Materials S1).

5.5. Qualitative and Statistical Analyses

For the qualitative analysis, the Atlas.ti software was used to manage and facilitate the transcribing and content analysis of the above public-private respondents interview data which were audio recorded and field noted. The data were abductively analysed (see Hsieh and Shannon 2005) using 14 codes: a total of 10 deductive codes and four inductive codes, through systematic classification process and themes linking POS dilemmas and property rights failures causes (see the codebook in the Supplementary Materials S2). During the coding process, to ensure the consistency of the analysis affecting the final results, an intra-coding procedure was applied, instead of using the multi/inter-coder method. The former is believed to be more valid and efficient because the latter using the negotiated and adjusted agreement principle may lead to the similar outcome of consistency as the intra-coding one. Other non-expert coders may be likely to alter and adapt their coding analysis according to their main coder who is the expert of the subject matter, and in this case the experts were the authors (see Campbell et al. 2013). Besides, descriptive and inferential analyses were also performed using the Statistical Package for the Social Science (SPSS18). First, principal component analysis extraction and the orthogonal rotation-based exploratory factor analysis were carried out to test the construct validity (uni-dimensionality) by categorising 27 items: C3, C8, C9, C12–C19, D1–D14, D16 and E2. The results of the Kaiser–Meyer–Olkin and Bartlett test were 0.822 and $\chi^2(200) = 1721$, fulfilling the minimum rule-of-thumb of the sampling. Overall, the 27 Likert-scale items under the two dimensions of users' consumption behaviour and local governments' POS management achieved the minimal criterion of the factor loading (≥ 0.3). Cronbach's alpha analysis and the Kruder Richardson (KR)-20 analysis were performed to test the internal consistency (reliability). The results proved that the questionnaire's items were reliable (i.e., α should be ≥ 0.5). The Likert scale of 18 items obtained $\alpha = 0.858$ for the local government's POS management and governance dimension; 21 binary-scale items on the types of POS issues and frequency of POS visit scored $\alpha = 0.730$; and lastly nine Likert-scale items under the dimension of users' POS behaviour issues obtained $\alpha = 0.501$. In short, the questionnaire items were

⁸ For each neighbourhood, 10 residents were purposively sampled. Therefore, 20 neighbourhoods from 10 zones amounted to 200 samples of respondents. This sample size is acceptable because the residents' view is treated as a supporting or secondary role in triangulating the findings of 'larger' qualitative methodology (Creswell and Clark 2007). Additionally, it sufficiently fulfils the study's analysis requirements, including inferential correlations.

⁹ The transformative design refers to the theoretical and conceptual frameworks (e.g., property-rights theory, commons theory, social dilemmas and opportunism) that were employed to underpin this study methodology.

deemed reliable and valid as they specifically and indirectly correspond to answering types of property rights failures and POS commons dilemmas take place under the local government property regime. For example, while sections B and C concern the local government's POS management efficiency, that contributes to overall POS quality, the items within section D are specifically to determine whether and how maladaptive rights and incomplete (unclear) rights in terms of management duty of local government are associated with self-interested and opportunistic consumption behaviour of users, and therefore POS commons dilemmas, including overexploitation by public users, tax payment shirking by residents, management shirking by local governments, moral hazard, and free riding. The descriptive frequency analysis was carried out subsequently.

Considering the skewed distribution and data nature, a non-parametric inferential analysis was performed. Hence, due to the fulfilment of general criteria like data type: nominal and ordinal, random sampling, mutually exclusive categories, except for the "no more than 20% of cases should have an expected frequency <5" requirement, Pearson's chi-square tests, more precisely, the Monte Carlo simulation function with a significant value of 0.05 was applied to the several paired items. As many cases (>20%) had an expected frequency of <5, such Monte Carlo analysis was required as the usual Pearson's chi-square asymptotic value is biased (Mehta and Patel 2011). Besides, a two-tailed Spearman rank-order correlation analysis was employed to examine the monotonic bivariate relationship between five-point ordinal-ordinal variables. All types of analysis techniques used for the above questionnaire items, which were divided into five sections, are summarised in Table 2.

Table 2. Types of analysis techniques for 46 questionnaire items.

Types of Analysis	List of Items	Scale of Data
Descriptive analysis (Frequency analysis)	46 items from the questionnaire: A1-A5, B1-B3, C1-C19, D1-D16, E1-E2	Include 3- and 5-point Likert/ordinal data, categorical (dummy) data, & multiple response data
Kolmogorov-Smirnov and Shapiro-Wilk (normality test) on kurtosis and skewness	27 items: C3, C8, C9, C12-C19, D1-D14, D16 & E2	Likert/ordinal data
Exploratory factor analysis (Kaise-Meyer-Olkin, Scree plot, Bartlett's test of sphericity)	27 items: C3, C8, C9, C12-C19, D1-D14, D16 & E2	Likert/ordinal data
Cronbach Alpha (α) on two different sets of items after the factor analysis (Reliability test)	18 items: C3, C8, C9, C12-C19, D1, D2, D4, D12, D14, D16, & E2 9 items: D3, D5-D11, and D13	Likert/ordinal data
Kruder-Richardson 20 (KR-20) (Reliability Test)	21 items of B1 * and C10	Binary/dummy responses and multiple choices
2-tailed \rightarrow Spearman \rightarrow rank-order \rightarrow correlation (inferential/correlation)	B1, C8, C9, D1-D14, D16 & E2	Likert/ordinal data
Monte-Carlo simulation (Goodness of Fit and Independence tests) (inferential/correlation)	e.g. between D15 and C8, & D15 and C9	Between ordinal data and categorical data
Crosstabulation between nominal single response items and nominal multiple responses items (inferential/correlation)	Between C8, C9, D1, D2, D15, D16 & E2 and B1*, C2, & C11	Between single response ordinal data & multiple responses items

6. Results and Findings

6.1. Residents' Perception of the Current System of POS Management and Consumption

Based on the results, 44.5% of users never visited, and 45.5% of them seldom visited POS because, among others, the current state-owned POS was unmaintained (about 20%) and unhygienic (about 17%). Some of them (about 18%) were too busy to take a visit to their nearby POS (Table 3).

Additionally, based on Table 4, the top five quality POS problems were aesthetic and cleanliness (17.9%), maintenance and management (17.8%), adequacy (16.5%), landscaping (15.6%), and safety and security (14.7%). These findings (Tables 3 and 4) may further imply inefficiency of current POS governance and management of the local governments and undesirable consumption of public users.

Table 3. Reasons for not visiting their nearby community POS (B1*).

No.	Reasons for Not Visiting	N	%
1	Poor access	24	3.0
2	Facilities and amenities shortage	89	11.1
3	Many dogs	7	0.9
4	Crowded issue	2	0.2
5	Quite and unsafe	31	3.9
6	Poorly maintained	156	19.4
7	Dirty/unhygienic	132	16.4
8	Too busy	147	18.3
9	Security issue-strangers loitering	38	4.7
10	Unattractive issue	110	13.7
11	Too far	9	1.1
12	Physically unfit	3	0.4
13	Too little shade/hot	41	5.1
14	No more park	9	1.1
15	Users' incivility	7	0.9
Total		805	100.0

Table 4. Perception (ratings) of users on eight features POS quality under current POS governance.

No.	Response	Good		Fair		Poor		Undecided		Total	
		N	%	N	%	N	%	N	%	N	%
1	Design & Aesthetic (C12)	16	8.0	127	63.5	56	28.0	1	0.5	200	100.0
2	Cleanliness & Maintenance (C13)	4	2.0	18	9.0	178	89.0	0	0.0	200	100.0
3	Accessibility (C14)	28	14.0	81	45.5	91	40.5	0	0.0	200	100.0
4	Inclusiveness of visitors (C15)	4	2.0	59	29.5	137	68.5	0	0.0	200	100.0
5	Landscaping (C16)	9	4.5	41	20.5	150	75.0	0	0.0	200	100.0
6	Safety & Security (C17)	20	10.0	32	16.0	148	74.0	0	0.0	200	100.0
7	Diversity & Variety (C18)	7	3.5	39	19.5	154	77.0	0	0.0	200	100.0
8	Adequacy & Availability (C19)	1	0.5	28	14.0	171	85.5	0	0.0	200	100.0

At the same time, for the perception of users on the current local government's POS governance, 92.0% of respondents agreed that constant uncivilised users, under the current POS management and governance, caused poor POS, while 88.0% of them agreed that the current practice was a burden on the landowners (Table 5 below). Residents (76.6%) also agreed that developers could maintain a better POS quality compared to landowners (9.5%) and government (2.0%). Such descriptive result also revealed that self-governing collective action was highly satisfactory (93.5%). Furthermore, the majority of the residents opined that the current local government on POS management is inefficient because 98.0% and 94.5% of users perceived that unspecified "how" on POS consumption and unspecified "contingency" was likely to cause POS quality issues, respectively. To add, 92.0% of respondents concurred that squatters or outsiders were mainly involved in utilisation and caused quality issues under the local government regime (Table 6).

The results of the Spearman test (see Table 7) showed that 19 sets of items were correlated with each other. Of the 48 correlated items, 38 inter-items correlated at a significant level of 0.01, while the other 10 inter-items correlated at a significant level of 0.05. However, only the two significant ones, particularly the ones that were significant at the level of 0.01 and with a moderate and strong correlation r coefficient value ≥ 0.5 (between D1 and D2, and C8 and D4), and one highly insignificant result ($p > 0.05$, lowest r value) (between C8 and D5) were selected as instances to be further interpreted. That is, with the existence of user inconsiderate misbehaviour in POS utilisation (D1), the respondents agreed that the government's POS management was inefficient (D2) ($p = 0.567 \leq 0.01$).

Apart from that, there was a positive relationship between POS quality (C8) and unreasonable tax imposition (D4) ($p = 0.522 \leq 0.01$). This showed that poorer POS quality raised respondents'

dissatisfaction with the current tax imposition on POS. The result also indicated an insignificant relationship between POS quality and influence of shirk on other users ($p = 0.002 > 0.05$). Users may likely to shirk when others shirk does not correspondingly lead to high agreement nor disagreement on the current poor POS quality. In other words, whether users shirk from paying the rating tax to the local government, this does not associate with the poor POS quality.

Table 5. Perception of users on the current local government's POS management and governance.

No.	Responses	Disagree		Neutral		Agree		Total	
		N	%	N	%	N	%	N	%
1	Inconsiderate behaviour of POS users (D1)	11	5.5	39	19.5	150	75.0	200	100.0
2	Poor governance and management of the government (D2)	13	6.5	14	7.0	173	86.5	200	100.0
3	Unreasonable tax imposition on residents (D4)	21	10.5	42	21.0	137	68.5	200	100.0
4	Constant uncivilised users lead to worse POS quality (D12)	5	2.5	11	5.5	184	92.0	200	100.0
5	The current practice is burdening for a landowner (D14)	1	0.5	23	11.5	176	88.0	200	100.0
6	Exclusionary is better than unexclusionary POS (D16)	2	1.0	28	14.0	170	85.0	200	100.0
7	Self-governing collective action is better (E2)	1	0.5	12	6.0	187	93.5	200	100.0

Subsequently, the Monte Carlo analysis results showed that out of 20 sets, only six sets of item-item correlations showed a significant relationship. Since the result of the association between the items of D15 and C8 was $X^2(9, n = 200) = 38.290, p = 0.000$, it means that there was a significant association (see Table 8). This result demonstrated that most users chose the developers as good POS providers when the local government-owned POS quality was poor. Interestingly, none of the users agreed that there was good quality POS under the current government management regime.

Next, for the association between the items of D15 and D1, for which the result was $X^2(9, n = 200) = 26.435, p = 0.004$, it was found that there was indeed a significant association (i.e., the p -value of 0.004 is less than 0.05). Developers are perceived to yield better POS quality when the poor behaviours of users have emerged under the current governance of government. Besides, the result of the association between the items of D15 and D2 was $X^2(9, n = 200) = 26.223, p = 0.005$, and it was revealed that there was a significant difference. Similar to the association between D15 and C8, developers are believed to yield better POS quality when users (approximately 90%) perceive and agree that the current government's POS governance and management are inadequate and inefficient.

6.2. Synthesis of All Stakeholders' Findings on Local Property Rights Issues and POS Dilemmas

Only significant, representative textual excerpts and findings are reported below. For an expanded version of content/coding analysis, one can refer to the Supplementary Materials (S3 and S4) for the government sector's and private sector's perspectives on local property rights issues and rural POS dilemmas, respectively.

Table 6. Perception of users on the opportunistic behaviour and consumption issues under the current state-owned POS.

No.	Response	Disagree		Neutral		Agree		Total	
		N	%	N	%	N	%	N	%
1	Defective behaviour is triggered by the government; users cause poor POS (D3)	3	1.5	61	30.5	131	68.0	200	100.0
2	User may shirk if others shirk, e.g., paying rating tax (D5)	2	1.0	22	11.0	176	88.0	200	100.0
3	Squatters or outsiders create utilisation and quality issue (D6)	5	2.5	11	5.5	184	92.0	200	100.0
4	Unspecified “when and what time” on consumption may lead to quality issue (D7)	17	8.5	31	15.5	152	76.0	200	100.0
5	Unspecified “how” on consumption may lead to quality issue (D8)	0	0	4	2.0	196	98.0	200	100.0
6	Unspecified “who and what age/ how old” may lead to quality issue (D9)	27	13.5	57	28.5	116	58.0	200	100.0
7	Unspecified “contingency” (e.g., no prior notice) may lead to quality issue (D10)	0	0.0	11	5.5	189	94.5	200	100.0
8	Users do not have an incentive to use responsibly or protect POS (D11)	9	4.5	12	6.0	179	89.5	200	100.0
9	Users no incentive or right to care/ monitor users’ POS consumption behaviour (D13)	4	2.0	14	7.0	182	91.0	200	100.0

Table 7. Spearman results for current-state-owned POS quality, governance, management and user opportunistic behaviour and defective consumption issues.

	B1	C8	C9	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D16
B1																		
C8	−0.346 **																	
C9	−0.185 **	0.587 **																
D1	−0.094	0.398 **	0.417 **															
D2	−0.112	0.357 **	0.396 **	0.567 **														
D3	0.261 **	−0.025	0.038	0.618 *	0.171													
D4	−0.187 **	0.522 **	0.332 **	0.257 **	0.371 **	−0.014												
D5	−0.013	−0.002	0.119	0.092	0.028	0.147 *	−0.018											
D6	0.281 **	−0.259 **	−0.003	0.004	−0.034	0.200 **	−0.082	0.256 **										
D7	0.086	−0.102	−0.012	0.046	−0.058	0.235 **	−0.128	0.186 **	0.080									
D8	0.161 *	0.064	0.247 **	0.178 *	0.116	0.369 **	0.017	0.220 **	0.156 *	0.333 **								
D9	0.267 **	−0.196 **	−0.057	−0.007	−0.098	0.119	−0.069	0.012	0.233 **	0.252 **	0.208 **							
D10	0.054	0.065	−0.017	−0.093	−0.017	−0.019	−0.011	−0.090	−0.132	0.010	−0.034	0.024						
D11	−0.006	0.152 *	0.180 *	0.096	0.06	0.021	−0.062	0.146 *	−0.104	0.074	0.048	0.006	0.117					
D12	0.040	0.036	−0.003	−0.122	−0.065	−0.017	0.013	−0.008	−0.306 **	0.113	0.116	−0.054	0.201 **	0.223 *				
D13	0.068	0.041	0.074	−0.075	0.050	0.124	−0.013	−0.136	−0.055	0.186 **	0.030	0.086	0.129	0.247 **	0.062			
D14	0.019	0.12	0.053	0.034	0.001	0.110	−0.005	0.011	−0.094	0.137	−0.047	0.038	0.204 **	−0.054	0.118	0.072		
D16	0.113	−0.004	−0.015	0.058	0.022	0.114	−0.047	−0.099	0.075	0.048	0.161 *	0.127	−0.091	−0.045	−0.015	0.071	0.076	
E2	0.032	0.026	0.078	0.119	−0.046	0.152 *	−0.082	−0.056	−0.055	0.220 **	0.227 **	0.132	0.000	0.125	0.039	0.04	0.136	0.215 **

* $p < 0.05$ level, ** $p < 0.01$ level. Note: B1 = Frequency of POS visiting; C8 = Nearby neighbourhood POS quality; C9 = Satisfaction on nearby POS quality; D1 = Inconsiderate behaviour of POS user; D2 = Poor governance and management of government; D3 = Defective behaviour triggered by government users cause poor POS; D4 = Unreasonable tax imposition on residents; D5 = User may shirk if others shirk; D6 = Squatters or outsiders create utilisation and quality issue; D7 = Unspecified “when and what time” on consumption may lead to quality issue; D8 = Unspecified “how” on consumption may lead to quality issue; D9 = Unspecified “who and what age/how old” may lead to quality issue; D10 = Unspecified “contingency” (e.g., no prior notice) may lead to quality issue; D11 = Users no incentive to use responsibly or protect POS; D12 = Constant uncivilised users lead to worse case; D13 = Users no incentive or right to care/monitor users’ POS consumption behaviour; D14 = Current practice is burdening on landowner; D16 = Exclusionary is better than unexclusionary POS; E2 = Self-governing collective-action is better.

Table 8. Monte Carlo analysis results.

No.	Variables	Chi-Square	DF	p-Value
1	Nearby POS quality (C8)	38.29 *	9	0.00
2	User's defective behaviour in consumption (D1)	26.44 *	9	0.00
3	Government's inefficient governance (D2)	26.23 *	9	0.01
4	Users may not monitor and intervene in other users' defective behaviour (D12)	4.24	9	0.83

* Significant at the $p \leq 0.05$ level. Note: The dependent variable (D15) is about agents who render better POS governance and quality (either government, developers or individual landowners).

Succinctly, taking into account and mixing all the quantitative and qualitative findings from the three groups of stakeholders (residents, private suppliers, and governments), which is a crucial part of the mixed-method design, 90% of them agreed that the current local institutional design system is subject to the issues of incomplete or unclear terms, unsuitable or misallocated rights, and attenuated or dis-incentivised property rights. These lead to various opportunistic behaviours of stakeholders, which consequently contributed to POS commons dilemmas and negative externalities.

Complex property rights-social dilemmas interrelationships were established. Aside from the connection between institutions and POS dilemmas, the relationships were also extended among the institutional failures (e.g., maladaptive rights were associated with attenuated and incomplete rights) and the dilemmas, e.g., poor POS management (shirking) and free-riding were associated with POS overexploitation. Regarding the opportunistic overexploitation and mismanagement behaviour of local governments, apart from the private suppliers and governments who were unanimously affirmative that indeed the current local government regime was facing tight budget issues, weak enforcement in terms of maintenance and management (e.g., delay and reluctance in dealing with site handing over and POS title transfer issues), more than 85% residents also agreed that the current local government regime providing and managing public domain CPR-based POS was not efficient.

As KKCH-1 explained, "*Management (monitoring) and maintenance of current government is indeed problematic and not sufficient, limited budget/resources allocation ... maintenance will only be carried out after two years or three, or we just neglect them then the public will overuse, e.g., they created illegal car-park, squatters break and vandalise the users' facilities and equipment, house extension, and so on.*"

Moreover, for NT POS particularly, both developers and governments fully agreed that indeed the governance of NT POS by the government is inefficient as the quality of POS is poor. They are mostly underused, disused, which then lead to illegal POS conversion or misuse to commercial and residential use. NT POS quality is far worse than most of the CL POS. This phenomenon resulted from, aside from the typical poor enforcement due to substantial cost, resource crisis which also occurred in CL POS, and the two prominent factors were (i) non-vesting issue and (ii) non-inclusion of some NT POS within the rating area jurisdiction. "*Officers do not know that they have to manage, some of them are not aware of the existence of NT POS. Basically, the NT POS is abandoned by the users as huge forest or bushes.*" (KKCH-4). This was supported by Dev-1 that, "*the management and maintenance are insufficient and inefficient under a local government with hundreds of POS. The POS became unusable jungle POS ...*"

Besides, for the issue of unclearness of terms specification in respect of both consumption and management rights and duties, it does not solely affect the enforceability and enforcement of government towards the site handing over, co-management of some communities, POS title transfer, and the inefficient management of POS during 18 months of private suppliers (shirking), but it also contributed to defective behaviour of public users and residents. These include the issues of overexploitation (e.g., vandalised POS and poor cleanliness of POS), self-enforced (or de facto perceived) exclusion, and POS free-riding. All of the respondents (i.e., governments and private suppliers) agreed that these dilemmas were rampant under the current POS governance institution. These common dilemmas can be associated with the misallocation of management rights of the local government and the incomplete consumption rights. Additionally, due to the incomplete (ambiguous) rights and the inefficient enforcement of government resulting in underinvestment and mismanagement, both government and residents mostly agreed that some users acted opportunistically by shirking their

duty in paying rating tax to the government and not using POS prudently, which the latter is a form of overexploitation. This is because the residents are not the POS owners and learn that their POS (mal) consumption behaviour is protected by the local government who has the legal POS management duty. As Dev-6 mentioned “... these POS equipments are mostly vandalised by users (always the problems) ... non-tax payer squatters and illegal immigrants are everywhere, but we cannot prohibit them from using and vandalising POS.” This dilemma is also supported by Dev-1 that, “... on the unclearness terms in POS consumption, indeed, this is not clear so it should be specified like other countries that the park is only meant for that residents only as they paid the tax ...”.

On the defective behaviour of government who converted the use of both NT and CL POS to other purposes (e.g., commercial, car parks, petrol stations, and housing estates) due to political agenda, albeit a few governments respondents were reluctant to share and be contentious about the issues, still some of them, a few public users and all of the private suppliers, agreed that indeed the governments have been involved in this ‘illegal’ conversion process. For the issues of NT POS disuse by governments who discontinue the purpose of POS by shirking their maintenance and management duty entirely, caused by several reasons above (e.g., budgetary issues and poor management plans), which subsequently resulted in overexploitation dilemmas, all of the respondents agreed to such tragedy occurrence.

Finally, on the defective (opportunistic) shirking behaviour of private suppliers, most of the respondents agreed that private suppliers are subject to underinvestment, reduced maintenance and management (e.g., providing inefficient monitoring and last minute maintenance), and weak enforcement (including the untransferred POS title, delaying POS title transfer, and unhanding site over to government yet left the POS in poor condition), especially when they were governed under the incomplete, attenuated (limited benefits) and misallocated (high cost and highly unenforceable) institution. As mentioned by KKCH-1, “Despite the rights have been restricted, the developers still will work or manage it as they have the incentive to gain profit from the buyers and reputation, for marketing purpose ... still, they may just underinvest so long as the minimum conditions for site handing over are fulfilled.”

Additionally, for the cases of private managers misusing POS by converting the spaces to commercial or housing purposes, according to some developers and most of the governments, quite a number of conversion applications have been undertaken, due to inefficient POS governance and political agenda. This problem can be associated with the current disincentivising (attenuated) rights owned by the developers who attempted to convert/misuse the POS by lobbying the public officials. As agreed by some developers and based on the field inspection conducted by the local government on POS, most of the overexploitation cases also occurred during the 18-month maintenance period, whereby construction debris, containers, and dumpsters were still placed within the POS compound for developers’ side operation and convenience. The issues of unhanding over POS and untransferred POS title associated with potential overexploitation (such as attempt to trade and application for other profiting purposes), as a result of the de facto perception on title deed by thinking that they are the ultimate and exclusive owners, are also worth to be emphasised for avoiding further misunderstanding and complication from arising. According to LSD-1, “titleholders will use the title as an excuse to misuse the POS,” and it was further explained by Dev-2 that “some developers may perceive they are the owners as they are not aware of their rights. They try to influence the government to do something to the space, especially the huge land size and desirable location.” Such misconception was also exemplified in the court case of Sabindo Nusantara Sdn Bhd and Anor v Majlis Perbandaran Tawau and Ors 2011 8 MLJ 653, in which one of the issues raised was that the plaintiff perceived that by having a name in the title deed, it entails exclusive ownership.

Therefore, to visualise the above overall textual (mixed) explanations in the graphical mind-mapping forms, the interrelationships between property rights issues and POS dilemmas are summarised in Figures 4 and 5. The latter (Figure 5), with two abstraction levels, is a simplified version of Figure 4.

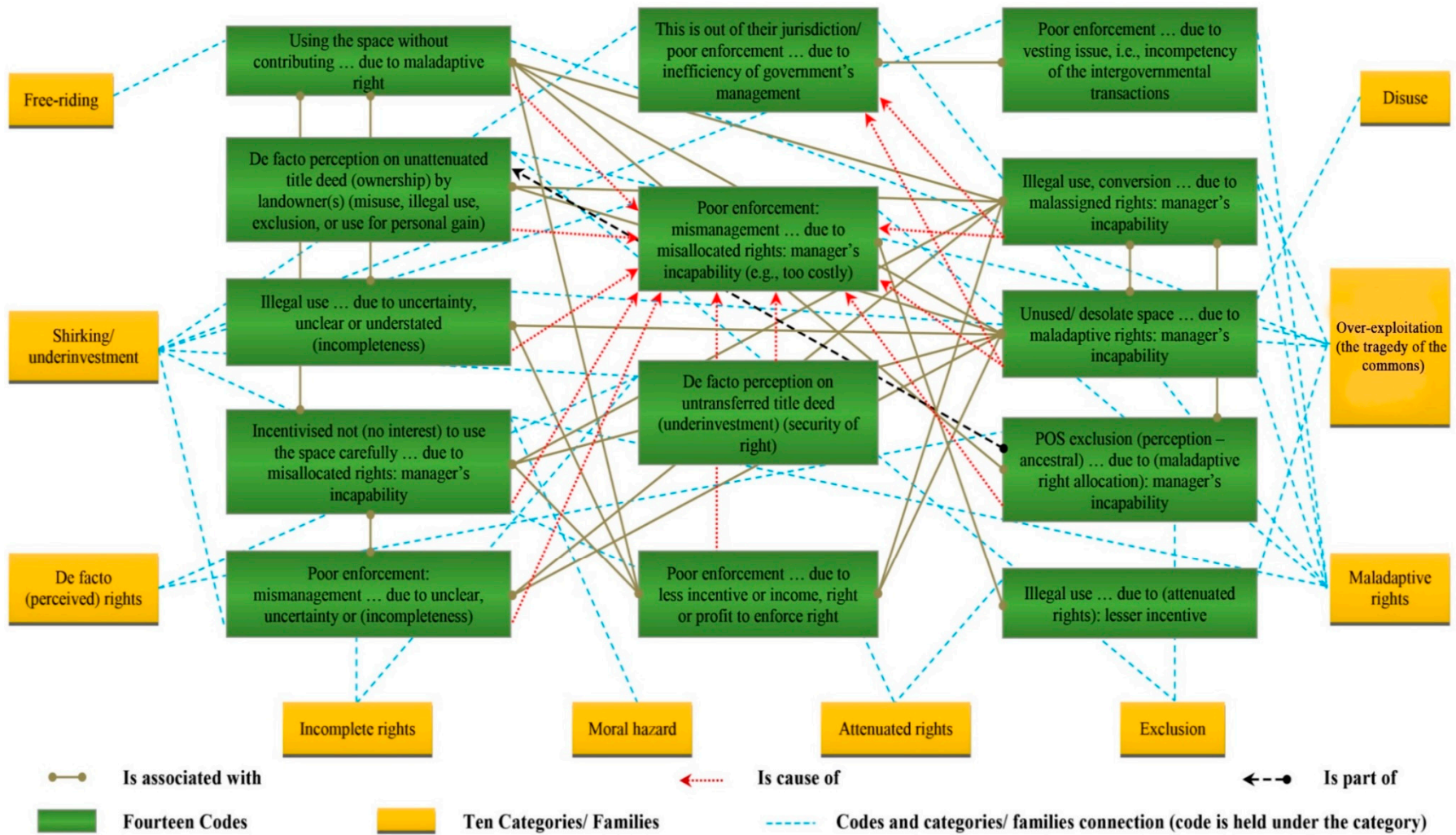


Figure 4. An expanded version of interrelationships (nexus) within and between property rights issues and POS dilemmas.

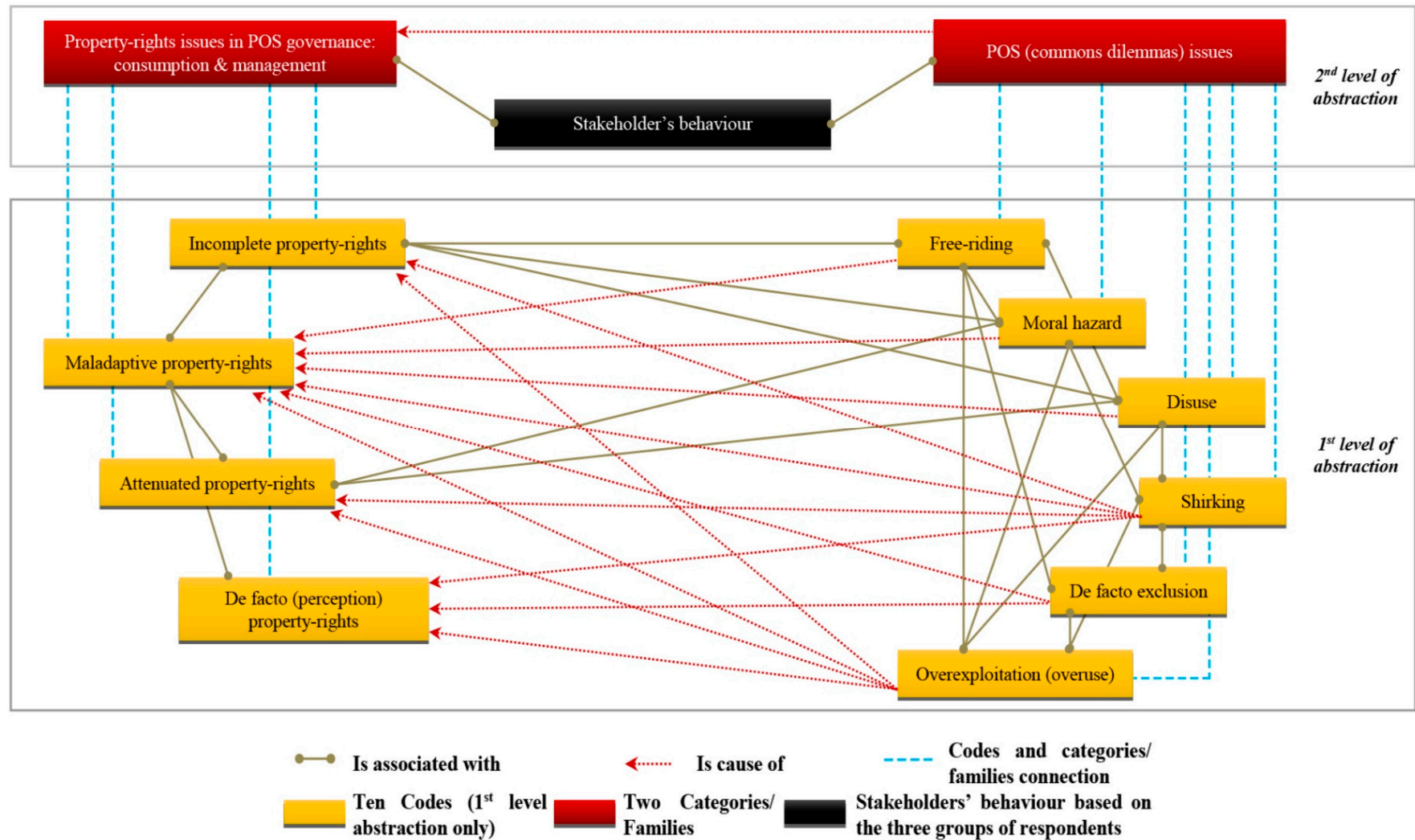


Figure 5. A simplified version of interrelationships (nexus) within and between property rights issues and POS dilemmas.

7. Discussion

The findings depict that the current complex local laws and property rights arrangements have contributed to a number of POS negative externalities; the diverse local institution, with high transaction (enforcement) costs and high perverse incentives, on POS governance is problematic and adversarial. Local stakeholders (landowners, developers, governments, residents, and public users) who are currently subject to the local institutional system have been behaving opportunistically/rationally to maximise and safeguard their economic or ecological interest via POS consumption and management. This supports Nobel Laureate [Williamson's \(1975\)](#) argument that, although opportunism is not always present in an individual(s) in an identical degree, indeed, when the aforesaid situation or dilemma causing high enforcement cost and perverse incentives is encountered, such behaviour is unavoidably engaged, that may compromise the collective welfare.

Since the current governments' governance and management (maintenance) on such public-domain CPR-POS is considered ineffective and inefficient, besides criticising the efficiency of the Hobessian (centralised Leviathan) state regime approach, it has rather averred [Foster and Iaione's \(2016\)](#) and [Colding et al.'s \(2013\)](#) contention on the public failures or the incapability of a state regime (anarchy of state). The reasons of the inefficiency of POS management are that the current local government is subject to numerous limitations and challenges, such as lack of resources, insufficiency of manpower, low priority/less political will and sensitivity on environmental concern or lack of interest to balance the social-ecological concern (i.e., no proper allocation fund list for park facilities), and less monetary revenue generation from POS (with the substantial amount of uncovered land rent). The above phenomena are consistent with [Ling et al.'s \(2016\)](#) findings. Besides, the government has to deal with an extensive, centralised information system that is burdened with many POS management tasks, bureaucratic practices and is subject to politics and corruption (lobbying and rent-seeking behaviour), e.g., gerrymandering and the conversion of land ownership and land-use.

Worse still, the local issue of miscommunication among the government agencies (between local government and land officers) on the issue of the unvested management right in NT POS is parallel with [Musole's \(2009\)](#) position on the inefficiency of the government's administration. The scenarios like unmonitored monopoly governance, poor policy prescription, e.g., using a conventional local spatial planning order (i.e., un-inclusive of the NT POS in the rating jurisdiction of local government), recurrent futile maintenance outcome issues, resulting in disuse and poor management (untransferred POS title and uninspected maintenance during 18 months by private supplier) are evident. Despite the unwelcoming conditions of NT POS due to lack of facilities attracting extremely few consumers, which to some extent may avoid overexploitation, NT POS underuse issues still occur that consequently cause overexploitation (e.g., illegal POS use conversion). This local rural commons fate is consistent with [Baur and Nax's \(2018\)](#) and [Miyanaga and Shimada's \(2018\)](#) arguments on the adverse effects of common resources underuse and disuse. Such inefficient POS governance can be triggered by the issues of the maladaptive state property-right regime. Due to above institutional inefficiencies and financial constraints, typically faced by a developing country as compared to developed (high-income) nations with effective governance, the maladaptation issues of rights for both rural CL and NT POS are the most prominent ones among other local right issues. Such distinction between countries also signifies that rural commons dilemmas and severity involved may differ from the urban commons (city parks) setting, where the latter's internalisation costs of negative externalities, incurring a smaller number of city parks to be managed and lesser POS dilemmas occurrence, are believed to be lower than the former.

Next, since the finding showed that the local restricted ownership rights (e.g., restricted land transfer and no exclusive right), conferred upon private suppliers in the titled CL POS is considered disbenefitting (dissipation of income and asset value of POS), aside from contesting the positive effects of rights attenuation, they sufficed to corroborate several scholars' positions like [Musole \(2009\)](#) and [Alchian and Demsetz \(1973\)](#), that indeed severely attenuated rights may perversely incentivise the private individuals to act opportunistically by purposefully seeking alternatives to maximise their

gain and convenience. For instance, this adverse attenuation subsequently made them disincentivised to invest and maintain the space efficiently (e.g., last minute or delayed maintenance occurs) and to engage in effective POS management during the 18 months maintaining period.

Due to rights attenuation, developers are also subject to the POS overconsumption issue. For instance, they may tend to overuse and misuse the space or influence the public officials for the conversion of use of POS (which involves bribes). By engaging in such behaviour, it can somehow increase some gain, at least 'recover' and 'compensate' their ex-ante constrained opportunity and profit costs, provided that such opportunism goes undetected and no sanction was taken by the government (Frech 1976). Thus, this local phenomenon (developers' management shirking and overexploitation) fits into Webster and Lai's (2003) claim that attenuated rights ensue in illegal and opportunistic behaviour. Aside from affirming the local diverse rights being generally well-defined in Coloma's (2001) lens that avoid certain POS dilemmas, in light of the empirical uncertain terms that are ex-ante discovered in the contract, particularly in regard to the matters of developers' maintenance, POS site-handing over, co-management of some communities, and POS title deed transfer issue by government, users' POS consumption, one should focus more on the ex-post opportunism costs of stakeholders.

Implicationally, since such rights incompleteness causes unverifiability and unenforceability issues, e.g., the violators cannot be liable and sanctioned for the externalities production, it consequently causes shirking and inefficient maintenance, e.g., last minute maintenance and underinvestment by both developers and local governments, and users' overexploitation. This local phenomenon conforms to the seminal theories of incomplete contracts, resulting in the disbenefitting effects on SES (see Casas-Arce and Kittsteiner 2011; Lu and Xie 2018). In short, the above local scenario for both developers and local government opportunism fits into Baker and Krawiec's (2005, p. 726) arguments, that "... *Incomplete contracts present a danger of underinvestment ...*" and "... *contracts are incomplete, the contractual parties may be deterred from making the ... investments ...*" (see Mahoney 2005). The incompleteness that leading to the defective consumption of local users confirms Mahoney's (2005, p. 110) assertion that "... *rights are never fully delineated, and property is consequently in danger of appropriation by others ... free-riding behaviour, and shirking, among other reasons.*" Therefore, ex-post opportunistic local stakeholders who render unenforceable sanction (contract) issue are incentivised to pose more opportunism (conflicting interests).

Moreover, local POS governance and quality issues associated with de facto (informal) property rights perception are in line with the Food and Agriculture Organisation's (FOA) literature on the existence and difference between de facto, de jure, formality and informality of institutions and property rights impacts on resources. For the issues of ownership security of the transferred titled leasehold CL POS as the government property, as well as the unattenuated and absolute ownership on POS title that is perceived by the private suppliers, and the perpetual customary land ownership, mainly perceived by the non-titled NT POS residents (Chirwa 2008), they all have contributed to opportunism and POS negative externalities. For instance, under the de facto/informal perceived rights, there are issues involving government's underinvestment. That means no budget is allocated for an upgrade on untransferred POS as they perceived that the POS is not their property, since the title is not yet secured, despite the fact that, de jure, it is theirs (Payne et al. 2009). In addition, such de facto rights perception contributed to NT POS residents' illegal overexploitation and unnecessary enclosure on POS, thinking that they are the 'rightful' owners. The above predicaments not only have confirmed that such de facto perceived rights matter in contributing to a behavioural change of individuals (Markussen 2008), such perceived rights have also affected their behaviour in opportunistically consuming and managing the POS.

Interestingly, this study's findings contradict Heltberg's (2002) argument on the insignificance of title deed on the resource investment. Albeit the titled property (i.e., CL POS) is 'commonly' claimed as a full and secured ownership which in principle incentivises more investment on the resources, still, such perceived 'unattenuated', absolute, and secured ownership via titleship, does not locally entail such; instead, it is de jure considered as trusteeship (see the Modified Torrens System). This local CL

POS case affirms Kim's (2004) and Pinckney and Kimuyu's (1994) positions that holding a title deed of a property/resource does not necessarily signify ownership.

Additionally, another fascinating insight is that the negative effects of critical local property issues on rural commons above are partly contrasting with Webster et al.'s (2016) findings, claiming that, due to the substitution effects, the absence, ambiguity, and weakness of property rights help reduce social poverty in informal settlements. Thus, we reckon that the former phenomenon, which is more of social commons with the primary role of protecting individuals and societies' interests, may not be relevant to the context of ecological commons presenting CPRs' salient, physical rivalry and non-exclusionary attributes, where the latter truly necessitates efficient, secure, and well-defined rights to govern it. Finally, it is revealed that one type of dilemma results in other dilemmas and more severe negative externalities, e.g., underuse of local POS and shirking/disuse of government's enforcement on POS management can cause residents, private sectors, and governments to engage in opportunistic overconsumption behaviour (Wilson and Kelling 1982), which adheres to the Prisoner's dilemma theory that individuals are more likely to behave opportunistically. This local phenomenon vitally addresses McCarter et al. (2014) questions of what-and-how the multiple and simultaneous dilemmas take place and their effects on both ecological dimensions.

The findings suggested that the local property rights issues have connections among themselves, e.g., attenuation or incompleteness of property rights that ensue in shirking and overexploitation are empirically associated with maladaptive property rights (Webster and Lai 2003). When incomplete and severe attenuation rights arise, adaptively aligned property regime and rights can be essential for internalising negative externalities resulting from the former property rights issues. Since the property rights issues and social dilemmas are 'entangled', forming a complex property rights-POS dilemmas nexus, this local scenario supports Musole's (2009) view that dilemmas and negative externalities may be more pronounced if above rights issues have presented concurrently.

8. Conclusions

Providing effective POS governance to protect and sustain its quality poses a major challenge in rural management. One lesson learnt is that the application of the SES framework and the NIE theory is relevant and pivotal for explaining today's recurring rural neighbourhood residential POS consumption and management, quality, and sustainability issues. Since self-interested (rational) and opportunistic behaviour and six rural POS commons dilemmas are externalised, namely overexploitation, shirking, free-riding, moral hazard, disuse and de facto exclusion in the local SES, as a result of the four main types of local property rights failures (i.e., rights attenuation, incompleteness, maladaptiveness, and de facto rights), which the findings crucially help answer the above three-fold research questions on the types and number of property rights tragedies and social dilemmas, as well as (how) their complex right-dilemma interrelationships (nexus) occurred, implicationally, this empirical study provides valuable messages and insights to local policymakers (i.e., land officers and local authority) that the property rights system and transaction costs should be factored in for local POS governance.

The above findings and evidence meaningfully bridge the existing institutional-commons literature and knowledge gap, which solely examined and revealed limited, independent property rights issues instances (Webster et al. 2016; Kaiser et al. 2018) in the contexts of urban (Foster and Iaione 2016) and traditional commons (Miyanaaga and Shimada 2018), whose works have not covered in-depth discussions on the systemic interactions between institutional tragedies, opportunism, and commons dilemmas. This mixed-method study not only affirms the cross-sectional findings by Ling et al. (2016), but also extends their discussions, especially in providing more empirical evidence to further substantiate the arguments and results related to the types of local property rights failures and commons dilemmas involved as well as the complex interactions between rights and dilemmas.

Apart from the above contributions and potential generalisation of the findings (i.e., SES-NIE framework) to other shared/common resources, this paper, nevertheless, highlights that more studies are required to improve the above proposed framework. Future studies need to explore other types

of rights issues and commons dilemmas in rural neighbourhood commons settings. Since this study is solely restricted to the in-depth institutional economics and behavioural discussion, prospective research can take into account other potential exogenous factors concurrently. The studies may concurrently include the socioeconomic background of POS users (e.g., education, age, income level) and the spatial dimension of POS (e.g., density and location) that may influence POS consumption and management pattern and subsequently its quality. Such study can be undertaken using a more advanced regression analysis, and it is of value and interest to scholars and practitioners because, via the comprehensive study, a predictive framework/model is offered that may be of help to their decision-making in addressing POS governance and quality issues.

Last but not least, this study further suggests that, to internalise the current property institutions issues resulting in POS dilemmas and externalities, re-engineering of the current POS ownership regime and management rights, through dynamic property rights realignment, is necessitated. A common-property-based self-organising regime, coupled with practical means encompassing ex-post opportunism governance and homeownership association, is recommended as future research. Such collective action is believed to provide more efficient club-based POS governance that consequently shapes a more liveable, sustainable neighbourhood community (see Ling 2019b).

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