

Institutional property rights structure, common pool resource (CPR), tragedy of the urban commons: A Review

G Ling^{1,4} and C S Ho² and H M Ali³

¹ PhD Candidate, Faculty of Built Environment, Universiti Teknologi Malaysia, Malaysia

² Lecturer, Deputy Director of Office of International Affairs, Universiti Teknologi Malaysia, Malaysia

³ Lecturer, Deputy Dean (Academic), Faculty of Geoinformation and Real Estate, Universiti Teknologi Malaysia, Malaysia

Email: lhtgabriel2@live.utm.my

Abstract. There have been a plethora of researches on the significance of public open space (POS) in contributing to societies' sustainability. However, by virtue of identified maladaptive policy-based-property rights structure, such a shared good becomes vulnerable to tragedy of the urban commons (overexploitation) that subsequently leads to burgeoning number of mismanaged POS e.g., degraded and unkempt urban public spaces. By scrutinising the literatures within property rights domain and commons resources, an objective is highlighted in this paper which is to insightfully discourse institutional property rights structure pertaining to the mechanism, roles and interrelationship between property-rights regimes, bundle of property rights and resource domains; types of goods on how they act upon and tie in the POS with the social quandary. In summary, urban POS tragedy can potentially be triggered by the institutional structure especially if the ownership is left under open-access resource regime and ill-defined property rights which both successively constitute the natures of Common Pool Resource (CPR) within the commons, POS. Therefore, this paper sparks an idea to policy makers that property rights structure is a determinant in sustainably governing the POS in which adaptive assignment of property regimes and property rights are impelled.

1. Introduction

Open space is not a square land-use concept in urban planning but it can rather be signified in wide array of definitions and characteristics [1]. The diverseness makes the open space an idiosyncratic constituent which vitally contributes to sustainability of cities. Inasmuch as the preservation of POS is essential, profuse researches have been done and reported that there are numerous factors influence the POS conditions nevertheless, an institutional (policy-based) element; property rights structure¹ has more often than not been pretermitted as essential component or scant researched in the arena of academic which has immensely contributed effects in many kinds of resources [2-4] particularly in POS context, as urban commons [5,6-8]. Therefore, property rights structure is the corpus in which the writers endeavour to flesh out the structure and its roles with respect to the POS on how it can be colligated with the tragedy of the commons by a priori analysing the property constituents (bundle of rights, property regimes) on how it affects the resource domains; types of goods.

2. Property rights structure, Common Pool Resource (CPR)

Within the panoptic study of property rights, Buck [9] ineluctably distinguished central terms or constituents such as bundle of property rights or property rights, property rights regimes, resource domains or resource unit which they are part and parcel of the property rights structure. Connoting that, such structure is framed up by the constituents and analysis by taking them into consideration is

⁴To whom any correspondence should be addressed.



substantive especially if any alteration takes place within the structure which concerning the resource (i.e., POS) management and governance. First off, in property rights' setting, Grafton [10] cogently argues that, "property rights are the fundamental to understanding the problems associated with the exploitation of the environment". Li et al., [11] further asserted that most environmental issues (e.g., POS) are by virtue of the incomplete, inconsistent, insecure or unenforced property rights that may affect behaviour of actors by discounting them to invest in long term productivity of resource in terms its value, efficiency, and sustainability (see also, [12]). These phenomena prima facie set forth the property rights are the underlying factor in resource governance² but some scholars argued otherwise that the policy-based property rights regimes shall originate prior to it [13] which is clarified in later part of this paper. Irrespective of the former polemic³, in general, two types of property rights are acknowledged, a legal (formal-recognised by government) or de jure right (as supporting role to enhance the claim or ability) whilst economic rights (ultimately that is what people are seeking for: right to enjoy the resource or power of individuals' appropriate benefit, income from their own goods or assets they possess [14-17]). Such an economical-classification of the property rights can be likened to a bundle of sticks, with each stick constitutes a right, or a stream of benefits or claims which not merely recognised by de jure right but also de facto right (informal or self enforced rights and more wholly, these bundle of rights can be associated with positions e.g., authorised users have rights of access and withdrawal [2]. Concisely, it is discovered that with myriad types of property rights, the consequences of resources may vary e.g. if one is obligedly conferred upon rights of management in which he has feasibly exercised the right over the resource then the resource governance is probably better than those who merely de facto exert the using rights without or fail to manage it. Thence, issue of robustness of property rights is imperative in resource management, the stronger [18-19] and/or well-defined [20] property rights, the better or improved resource condition would be⁴.

Next, another crucial property constituent is the four categories of property rights regimes which are distinctly acknowledged⁵ [9,21] in defining the economic property rights⁶ [9]. As a rule, indeed such institutional structure shapes the aftermath of the resources where Bromley [22] and Hanna et.al.,[13] nem con argued that the role of property-rights regimes that embedded within the structure had ostensibly formed behaviour and interaction patterns and produced resource use practices that invariably impact the quality and quantity of the resource investment [15,17,23]. Hanna et al., [13] has further posited that "Property rights regimes are critical institutions... They link society to nature and have the potential to coordinate human and natural systems in a complementary way for both ecological and human long term objectives". An elucidative interrelationship between the property rights regimes and property rights has thereof moulded the resource domain more precisely, POS in relation to types of good. POS is orthodoxly considered as pure public goods, however, by virtue of the property rights structure, has in turn changed the initial natures of POS⁷ to impure public good [4] or commons⁸ more precisely as Common pool resource (CPR) [23,24] and in urban POS setting, it is classified as modern or new commons- urban commons⁹ [6]. Common pool resource (CPR) are natural or synthetic resources managed under one property regime where one person's consumption of the commons diminishes others' opportunity of utilisation (depletive) and simultaneously exclusionary right of the pool users is impossibly exercised (unexclusive) [9,24]. In simpler words, commons or more particularly CPR is posited by Hess [6] as "*a resource shared by a group where the resource is vulnerable to enclosure¹⁰, overuse, and social dilemmas*" which is closely akin to Tragedy of the commons [25] that discoursed in following section.

3.0 Tragedy of the Urban Commons

It is necessary to comprehend the seminal metaphor by Ecologist Garrett Hardin on Tragedy of the Commons¹¹. Hardin [25] contended this tragedy ensues due to ambiguous or ill-defined property rights, when each individual is endowed with great freedom in terms of *access right to use* a given resource without a cost effective way to monitor (manage) and exclude each other's use, the resource is highly susceptible to overuse and ultimately leads to dissipation, quality degradation and congestion of the resource. In his oeuvre, Hardin [25] concluded that "...freedom in commons brings ruins to all" where locking into a rule of boundless, humans are inescapably and assumedly behaving self-interestedly for their own welfare without regarding others' interest (without cooperation between parties) and the general health of resource as well which can be explicated in game theory-Prisoner Dilemma analysis. However, this does not inevitably intend that all individuals will maximise in such extent rather by virtue of a strong inducer which exclusionary power or right cannot easily be invoked¹² to throttle (freedom) those who have overused the good or service which in turn causes environmental resource degradation [26]. Thereof, indeed there is a substantial linkage between the property rights structure and resource tragedy in which modification of the institution can bear upon the resource's destiny whether or not it prone to any social tragedy e.g., congestion or overuse. Hence, after grasping rudimentary mechanism and functions of the property rights structure on resource domains, tout de suite writer has contextualised such phenomenon in the urban commons, the POS which is virtually analogous to Hardinian's open-access pasture, the individuals or users become the herdsmen who are enwrapped in limitless appropriation system, and then the space becomes rivalrous which consequently leads to sub-optimality of space. Such state of affair can likewise be supported by Ellickson [27] that the open-access regime of urban public spaces (POS) makes them "*classic sites for tragedy*". Inasmuch as the POS is conceived of aforesaid governmental property¹³ in the forms of municipality [28, 29] however such ab initio and de jure state-owned good has alas transformed into de facto open-access resource regime and become public domain which subject to risk of over-exploitation and congestion due to lack of effective monitoring system by government [29,30] or '*regulatory slippage*' by Foster [31] implied that "*when the level of local government oversight and management of the resource significantly declines, leaving the resource vulnerable to expanded access by competing users and uses*" which is regarded another government-created tragedy of the commons. In light of the natural opportunistic behaviour of users plus weak or mal-assignment of property rights (institution) in terms of absent exclusionary right suffice to devastate the POS condition, but still the deficiency of government's enforcement and provision make the whole situation exacerbated¹⁴. In another word, state or local government-owned-space is destined to confront tragic spatial dilemma as it is 'open' for public to misuse at others' cost. Above all, Getachew-Kassa [32] argued that public space deterioration is mostly due to infirm institutional mechanisms (property rights structure) to protect the use of such urban space which it has been left desolate and unkempt. In a nutshell, aftermaths of tragedy of urban POS are numerous which unarguably pertains to institutional factor e.g., a historic public space, is contested (congestion) by many foreign visitors who are free riders- ubiquitous access and enjoy rights on the space without contributing any, instead the provision fund is generally derived from the local community's property tax who will eventually be incentivised to underinvest (noise, queuing and conflict resolution costs). Besides, people may overuse the urban POS for other purposes e.g., for dumpster site [33], sleeping ground for poor children [32], and the most common issue is vandalism [30] e.g., recreational park' equipments are left broken (substandard upkeep), park abandonment, and the new dog park issue [34]. All these POS's plights generate negative externalities to urban sustainability- poor quality of life (e.g., obesity, heart diseases), property value downgraded and low livability of milieu (e.g., pollutions).

4.0 Conclusion

Thereof, institutional property rights structure (property regimes and property rights) is evidently a sine qua non in shared space governance where dysfunctional institution can catastrophically affect the sustainability of POS that consequently pose dozens of externalities. The following extensive figure 1 shows a complete picture on how such institutional mechanism (property structure) portrays its roles

in plausibly leading the POS to urban tragedy in association with inimical outcomes. Thus, adaptive analysis on the re-assignment of such prime mover is demanded to curtail the POS urban dilemma (overuse) e.g., common-property-based Ostrom's [24] eight principles¹⁵ which is analogous to Buchanan's entrepreneurial club good¹⁶ can be employed to manage the POS which is believed outperforming the mainstream approaches' privatisation and Leviathan state intervention. Besides, the counterparts (non-institutions) are worth explored e.g., from economic transaction cost perspective-costs and benefits analysis is involved to ascertain feasibility of property rights assignment whilst in terms of spatial dimensions (location, shape, size), digital application (e.g., Geographical Information System, GIS) is indispensable in today's world as it can facilitate the flow of decision-making in POS management, particularly the property rights can aptly be defined e.g., GIS application (via map visualisation and analysis) in lot boundaries survey of POS is pertinent to property rights or ownership record e.g., displaying the POS under different property regimes with high vulnerabilities, and also access and management rights are facilely delineated to avoid disputes over land tenure insecurities.

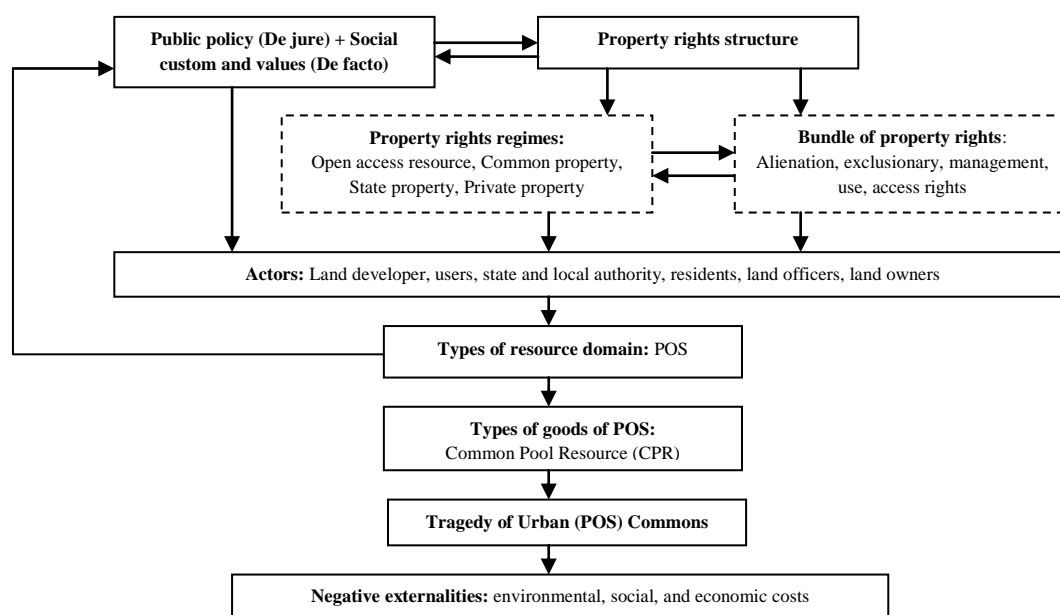


Figure 1. Institutional property rights structure as the determinant of urban POS tragedy

Source: Adapted and slightly modified from Gerber et al., [50]

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