

## Article

# Transformation of Local People's Property Rights Induced by New Town Development (Case Studies in Peri-Urban Areas in Indonesia)

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**Abstract:** New town development as a form of large-scale development is not a new phenomenon, particularly in developing countries. This development mainly takes place in peri-urban areas due to the high pressure caused by the growing population and the lack of facilities and infrastructure in city centres. As an effect, local communities who originally occupied the land often lose their rights over the property their livelihood might have relied on. Property rights can be grouped differently, classified according to different bundles: appropriation, ownership, and formality of rights. This paper investigates to what extent new town development in Indonesia has affected the property rights of local communities, in terms of the transformation of rights and security level. Moreover, it examines to what extent this transformation has been affected by urbanisation pressure. Ample attention is paid to the transformation of various bundles of rights concerning different usage of property, both residential and cultivated land. A total of 252 questionnaires were distributed to three different locations of new towns in Indonesia. A before-after analysis was employed to identify the transformation of the property rights and their security level, followed by multiple linear regression analysis to observe the influence of the urbanisation pressure to the security level. The research reveals that the transformation of property rights of local residents mainly concerns the appropriation rights. The analysis also indicates that there is a tendency that the security level decreases. Statistically, this appears to be affected by urbanisation pressure variables: type of land, land use, and occupation. With this study, we offer on the one hand a conceptual framework for assessing property rights, while on the other hand, we provide empirical evidence regarding the effects of new town development on property rights transformation and its security level.

**Keywords:** large-scale land development; new town; transformation; property rights; security level; local community; urbanisation pressure; Indonesia

## 1. Introduction

The growing population and the lack of space in cities have become continual challenges faced by urban planners. The United Nations (UN) recorded that the global population living in urban areas accounts for 55% and is projected to increase up to 68% by 2050 [1]. This condition has served as a challenge for people living in city centres in terms of providing their needs for housing, infrastructure,

transportation, and so forth [2,3]. As a consequence, urban sprawl occurs, particularly in peri-urban areas [4,5].

Some of these ever-increasing pressures in peri-urban areas involve large-scale land development [6,7]. The emergence of new towns in peri-urban areas can be seen as an example of this large-scale land development [8]. In Indonesia, new town development has been regarded as a solution to resolve urban problems, extending the availability of housing and infrastructure, and reducing disparity in peri-urban areas [9–11]. Moreover, this form of large-scale development is also believed to be able to increase land values in peri-urban areas and improve the provision of infrastructure and urban facilities [12,13]. Many scholars discovered that new towns and other large-scale developments cause negative socioeconomic effects [14–16], negative effects on biodiversity [17,18], environmental effects [19–21], as well as the negative impact on urban health [22]. This may seriously harm the life of the local communities living in the development area. Those people are expropriated from their properties and the property rights over that land [6,23–27]. In many cases, local communities face losses because they heavily rely on those lands to support their livelihoods, while fair compensation for the loss of their property rights over the land cannot be properly secured due to legal uncertainty or unambiguity of the rights [23,28]. This phenomenon can be widely found in developing countries [29–31], including Indonesia [6,12].

Property rights, in simple terms, can be defined as a bundle of rights embedded in a property [32–35]. Regarding land development, property rights should be fully understood as being not only the right to possess the land but also the right to appropriate it [35]. Apart from that, it is essential to understand the formality degree of the rights embedded in the property, since it could play a crucial role in ensuring the legality of the transaction or the exchange process of the rights and its related values [36,37]. By assessing all these rights, a complete understanding of the security level of property rights can be achieved. This is important because, as argued by many scholars, secure property rights are considered as a central determinant of livelihoods for local people and also for economic development in general [38–41].

To date, studies concerning property rights over land tend to be focused partially on one specific topic, i.e., ownership [26,42,43], appropriation [16,29], as well as the formality of rights [36,37,44]. This paper aims to develop a framework to investigate the different categories of property rights bundles in an integrated way to assess the level of property right security. This framework is then applied to observe how local communities' property rights and the associated security level have been transformed due to large-scale land development and to assess to what extent urbanisation pressure influences these transformations. Ample attention is paid to the development of new towns and the change of various bundles of rights over both residential and cultivated land and properties. The aim of the paper is, on the one hand, to provide a framework to assess property rights, and on the other hand, to provide evidence regarding the transformation of local communities' property rights and useful insight on how urbanisation leads to changes in security levels.

Following the introductory section, Section 1, this paper is organised into seven parts. To set the context of this paper, Section 2 discusses trends in large-scale land development, including new town development. Section 3 provides a discussion of the literature on property rights. Also, in this section, a framework for assessing property rights is developed, including the related security level. Section 4 presents our research approach and data collection methods. Section 5 describes the findings of our study, while a discussion of these can be found in Section 6. Conclusions are given in Section 7.

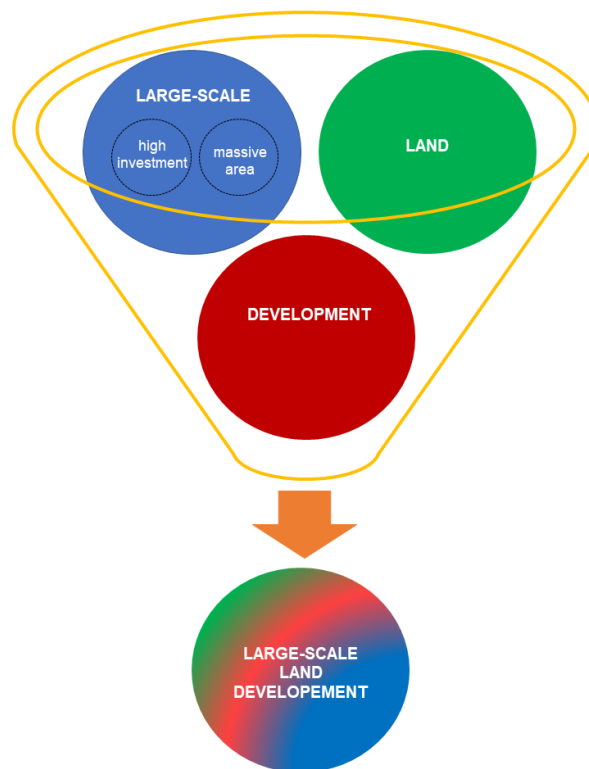
## 2. Large-Scale Land Development

### 2.1. Large-Scale Land Development and Driving Forces of Urbanisation Pressure

Development growth is commonly used as a benchmark to determine whether an urban area is successful or productive [45]. Urban development is inseparable from the provision of land [46]. Land development refers to transforming a form and/or function of land for the continuity of activity [47].

Some scholars believe that the greater the needs of land to perform activities, the more intensive the execution of the spatial transformation will be [12,48,49].

Along with the increase of population growth and urban activities, land development is often carried out in a large-scale form. Some scholars have characterised this development as a massive area of development with more varied land uses [8,50]. Evidently, this development also requires high investments [23], provided either by the public sector or private developer [6,51]. A depiction of large-scale land development is illustrated in Figure 1. Although these developments are also discovered in urban areas, they appear to be more prominently developed in peri-urban areas, also known as peri-urbanisation [52,53]. The main reason for this emerging phenomenon is the broader availability of land in urban outskirts at lower prices [51].



**Figure 1.** Large-scale land development.

Peri-urbanisation involves a penetration process from the city centre to the transition area of rural and urban use [53]. This has become an important discussion topic in Global South countries [48]. Most of the main cities in the Global South that were built in colonial times were not designed for the long purpose. Thus, nowadays, these cities cannot accommodate urban activities and population growth [54]. Furthermore, this phenomenon is characterised by the change of economic structure and community activities from agriculture to nonagriculture, as well as an increase in land prices in the area [55–57]. In addition, the unique and dynamic characteristics of peri-urban areas trigger spatial complexities.

The vast large-scale land development in peri-urban areas is inseparable from pressure coming from urban areas. As argued by Li, Sun, and Fang [58], this urbanisation pressure is triggered by geographical, locational, and socioeconomic aspects. The geographical aspect emphasises the type of land and land uses which determine the direction of the expansion of the city [59]. The locational aspect is closely related to accessibility [60–62]. Lastly, the socioeconomic aspect relates to land price, occupation, and welfare. The urban expansions usually prefer greenfield locations, assuming both lower land prices and lower servicing costs [59]. In another case, urban pressure seems to be influenced by political decisions [63,64]. The spatial development policy in the peri-urbanisation

area—as an outcome of the decision—is believed to be the right decision for urban regeneration due to depressed main cities and their suburban areas [64]. However, other studies have revealed that the development actually enlarges social and economic disparities between residents in the development and surrounding areas [65,66].

## 2.2. *New Towns as a Large-Scale Land Development*

Large-scale land development can be categorised into five forms: large-scale infrastructure [67,68], industrial estates [69–71], large-scale agricultural investment [72,73], large-scale residential [74–76], and new towns [12,77,78]. The development of new towns is considered to be the most dynamic type of development [8], usually involving a substantial amount of land [50,79,80].

In the modern era, the idea of a new town initially goes back to late-nineteenth-century Europe [16], while the concept became more common since the beginning of the twentieth century in the U.S. [8], then followed by Global South countries along with the upcoming of colonialism [81]. In the post-colonialism era, the new town grew for several reasons, such as natural resource exploitation [9], housing provision [74], and improvement of urban facilities [12,75]. In the case of Indonesia, the new town in the post-independence period emerged as an effort to provide new housing outside the core of Jakarta City [82]. Since the early 1990s, many new towns were developed, primarily concentrated within the Jakarta Metropolitan Area as a result of the increasing population growth and scarcity of lands in the city centre [12]. The rapid new town development was also inseparable from the “Repelita IV (Five-Year Development Plan of Indonesia)” policy, which provides an opportunity for private developers to develop new town housing areas [82]. Nowadays, this development trend is widely spread in Indonesia.

The success and direction of new town development cannot be separated from the process, including the roles of stakeholders involved. Since this development requires a high investment, the function of private developers in the development process becomes more crucial. Roles of the developers relate to land acquisition, construction, finance, and management of the developed areas [78]. As a consequence of their dominant position, development relies on economic profits. Meanwhile, the involvement of national and local governments is limited. The national government plays an important role in developing regulation related to large-scale development, whereas the local governments are involved in providing building permissions, monitoring the land use, economic development, and environmental issues of the new town areas [78]. Similar to other countries [83–85], new towns in Indonesia are built for upper-middle-income groups [12]. This flow of ‘capitalist’ investments has resulted in new towns becoming rather exclusive. Consequently, local communities are merely positioned as a marginalised object of the development [49]. The people who owned the land are threatened by impacts of the development, primarily transformation of rights over the land.

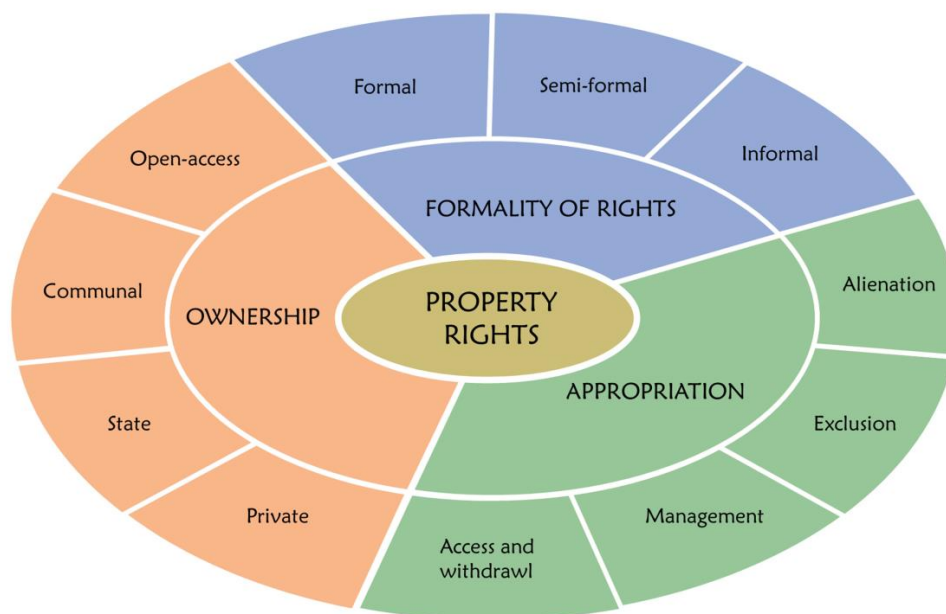
## 3. **Property Rights over Land**

Property rights represent the bundle of rights which describe the relationship between rights holders, either individuals or groups, and their properties [86]. The rights should be understood as the various rights which can be used and allocated to a piece of property [32,34,35,87]. Payne [88] described property rights as an ownership-based relationship between a party and their property. The ownership is defined as varied rights and obligations derived from the laws conferred to the owner of a property to relate with other parties [89]. Rodgers [90] pointed out that formality of rights is inseparable from a property where this right is understood as the right to hold power to enforce property according to rules and policies. With this right, the security of the property will be further stimulated, so is the value of investment [91,92].

### 3.1. *Different Categories of Property Rights Bundles over Land*

In terms of land development, the property is often used and owned by different parties. These various arrangements might be based on varying degrees of the formality of these rights, possibly

affecting the transaction process of the rights. In developing countries, for example, many farmers rent their cultivated lands, which means they only hold rights of appropriation on the lands under the ownership of that land by other parties, while the transaction between the owner and the renter/user of the land is based on an informal agreement. In this paper, we distinguish within the property rights bundle ownership, appropriation, and formality of rights. The detailed descriptions of those property rights are provided below, and the summary can be seen in Figure 2.



**Figure 2.** Conceptual framework of property rights in land development. Source: modified from [25,26,33,34,39].

- *Ownership*

Ownership is the right to own a property conferred by a claim or title [88,93]. Concerning the ownership category of property rights, a property can be distinguished based on the different claimants or holders of the right. There are at least four types of the claimant of these rights, including private, state, community, and no one, or hence, everyone [42,94,95]. A *private* individual as a claimant of the right can either be a person or a corporate organisation. The person who holds this right should be able to receive the benefits from the land in unlimited time, and she/he can individually decide to restrict other people from utilising the property. In his book, De Soto [91] claims that this type of ownership is the success key to maximise the benefits from a property.

With the *state* as the claimant of the ownership right, a specific state institution or branch of government holds the title over the property. Although the state can be considered as the representative of the public, we can make a distinction between state ownership and public ownership. In the former, the state can exclusively utilise or access the property through its specific institution/branch of government and exclude other individuals from using it, while the latter is available to the entire public for use [87]. We refer to the latter as *open-access property* in which everyone has a right to claim the use of the property since no one has the title of its ownership. We also distinguish the open-access property from the *communal property*, which we define as a property jointly owned by a limited group of individuals or a community. This group or community is entitled to exclude other individuals from using the property under some kind of rules or statutes [96]. The group can also make their own decision on who among the members of their group can use the property and how can they use it [35].

In Indonesia, according to the Basic Agrarian Law (BAL or Law No. 5/1960), which is the central legislation governing land rights in the country, private property rights over land are widely recognised.

Still, the state has the right to control all land for the benefit of the people [97]. This right to “control” means that the state may impose a rule to regulate and implement a certain utilisation or reservation of land including those that are owned by private individuals and also to regulate legal relations between individuals and legal acts concerning their lands.

The BAL also recognises communal property based on customary law (the land is referred to as *tanah ulayat*) that already exists since even before the creation of the Indonesian state.<sup>1</sup> However, the BAL does not explicitly address the system to regulate this customary land, though the law stipulates that the exercise of the right should not be in conflict with national interests or other regulations set out in the law.

Regarding the land as an open-access property, it is not specifically mentioned or regulated in the law. However, it may exist in case the land is not claimed by anyone, and everyone can access and utilise the land. Given the fact that, at the moment, a systematic land registration is still ongoing in Indonesia and roughly only one-third of all lands in the country have been registered [96], many land parcels remain without a title of ownership which then can be considered as open-access property. Based on the control right of the state over all land in Indonesia, the government may impose a presumption that those unregistered lands are considered as public land until proven otherwise. Moreover, since the state controls of such land have to be exercised for the benefit of the people, the state may allow anybody to access and utilise it [98,99].

- *Appropriation*

The notion of appropriation can be equally understood as the term user rights and collective-choice rights, which were introduced by Schlager and Ostrom [35]. This right can be defined as a right to use and allocate the property. According to Schlager and Ostrom, in this sense, property rights over land can be divided into four categories: alienation, exclusion, management, and access-withdrawal [35]. The right to alienate the land or *alienation* right is defined as the right to manage, use, sell, or to let or execute these simultaneously. The right holders are entitled to receive benefits, to transform, to cultivate, or to convey the property for freedom’s sake to use the property according to their needs. The *exclusion* right is the right to access a particular property. It also includes the right to choose with whom and how the transaction of the property takes place. The *management* right can be defined as the right to manage and to change the natural resources by performing maintenance. A person with management right is authorised to decide how, when, and where harvesting will take place and how the property structure can be changed. The final category concerns the *access and withdrawal* rights. These rights are regarded as the lowest ones in which the rights are held only to take what the property can offer.

In Indonesia, according to the BAL, there are several types of rights related to different appropriation levels that someone can possess over land. These rights include *hak milik* (freeholds right), *hak guna usaha* (exploitation right), *hak guna bangunan* (development or building right), *hak pakai* (use right), *hak sewa* (rent or lease right), *hak membuka lahan* (land clearance right), and *hak memungut hasil hutan* (right to collect forest products).<sup>2</sup> The first four aforementioned rights are called primary rights since they are directly given by the state (with an exception of the use right which can also be given by a private entity who has a freehold right), and they can be sold, mortgaged, and inherited by a legal heir [97].

Among those four rights, *hak milik* (freehold right) can be considered as the strongest right since the holders of this right can basically use the land for any purpose based on their needs and interest in unlimited terms of time. However, the law also mentions that all land has a social function, which

<sup>1</sup> Indonesia proclaimed its independence on 17 August 1945 and has become a sovereign state since then.

<sup>2</sup> The law also mentioned that, apart from these seven rights, it also recognised other land-related rights such as *hak gadai* (pawn right), *hak usaha bagi hasil* (profit-sharing right), *hak sewa tanah pertanian* (agricultural land leases right), and *hak menumpang* (lodging right), which are regulated in other law or regulation.

means that the use of land must not be in conflict with the rights of others and the public interest. Given its definition, *hak milik* can be associated with the *alienation* right in the Schlager–Ostrom framework of property rights.

The other three primary rights do not have a permanent quality, and they serve as kind of commercial lease rights but for different purposes. *Hak guna usaha* (exploitation right) can only be used for economic activities including agricultural, fisheries, and animal husbandry. *Hak guna bangunan* (right to build) is somebody's right to build and own buildings on land that is not her/his own. While for *hak pakai* (use right), the holder of this right can use and/or collect products from the land. Although these rights can be transferred [100,101], individuals holding these rights face limitations to the use of land, implying that the owners should fulfil the permits to use of land. Based on the classification by Schlager and Ostrom, those three rights are categorised into exclusion.

The other three rights mentioned in BAL, namely, *hak sewa* (lease rights), *hak membuka lahan* (land clearance right), and *hak memungut hasil hutan* (right to collect forest product), cannot be transferred to other people. For *hak sewa*, the holder of this right can use and manage the land by paying a fee to the owner of the land for a certain period of time [97]. This right can, therefore, be associated with the *management* right in the Schlager–Ostrom framework of property rights. Moreover, *hak membuka tanah* and *hak memungut hasil hutan* apply to take and catch resources from the land or productive forest [102]; it is classified into access and withdrawal. In addition, related to Indonesia as a maritime nation, *hak pemeliharaan dan penangkapan ikan* is essential to protect fishermen's fishery rights in the exclusive economic zone (ZEE) of Indonesia ocean [103].

- *Formality of Rights*

The formality of rights is embedded in certain parties based on institutional perspective [36,92,104]. This right guarantees the property value and security of property transaction [39]. There are three categories of this formality: formal, semi-formal, and informal. When someone possesses a formal right over land, she/he has a right to empower and control the property based on rules and institutional provisions [33]. In Indonesia, a formal right is authorised by the Ministry of Land and Spatial Planning/National Land Agency (ATR/BPN) or Land Deed Officials through a formal certificate. Regarding semi-formal rights, the holder of this right has an authority to control her/his property, but it is not fully supported by legal power [105]. Practically, in Indonesia, the right is derived from a letter of agreement such as *girik*, *rincik*, *letter C*, *patok D*, or *SPPT* (Notification of Tax due) [37]. The last one, informal right, is defined as a right to control over property [33], through customary law, *adat istiadat* [106], a letter issued by village headmen [107], or even an oral agreement [105]. The properties embedded with these semi-formal and informal rights are also classified as unregistered [108,109].

### 3.2. Security Level of Property Rights

Property rights security is increasingly gaining attention in the international literature [110–112]. Determining the property rights security level relies on hierarchy in each of the categories of rights. The security level is defined by (1) appropriation rights, (2) ownership rights, and (3) the formality of rights. Appropriation rights determine the security level since they have a direct effect on the freedom to use the property to gain optimal benefits [35]. Based on Schlager and Ostrom's framework of property rights for appropriation, we distinguish five security levels concerning appropriation. Alienation has the highest level of security since property users can use and cultivate the property nonrestrictively. It allows the users full nonmaterial and material benefits from the property. After that, we distinguish 'exclusion', 'management', 'access and withdrawal', and 'absence of appropriation rights'. Exclusion and management rights refer to agreements on where the cultivation of the property should comply with. Access and withdrawal rights only give their holders access to the direct benefits from the existing property, without any capacity to transfer or transform the form of the property.

Regarding ownership, the security level cannot be ordered since each right holder is entitled to manage her/his property independently [42]. This implies that the holders have similar roles to access the property, to obtain profits, and to deal with the economic risks. Similarly, in Indonesia, BAL does not make any distinction in terms of security whether the land is owned privately, by organisations, corporately, or under the control of the state, which means that any legal entity has an equal position when they own a piece of land. Therefore, the hierarchy of each category in this right can only be distinguished by whether someone owns the land, with the former possessing a higher security level than the latter.

Considering the formality of rights, a formal right provides the highest level of security, because the holder of this right is strongly protected by formal regulation and the legality of this right secures her/him from being usurped by other parties. Besides, the existence of a formal right could reduce insecurity, giving no space for buyers playing around with the land price [95]. Informal rights have the lowest level of security due to less legality, which could hamper the holder from any transaction, and it could result in low investment value [106]. Moreover, property with informal rights cannot be used as collateral in renting and subletting [37]. Regarding the semi-formal right, its security can be considered to be in between formal and informal rights.

## 4. Methodology

### 4.1. Research Location

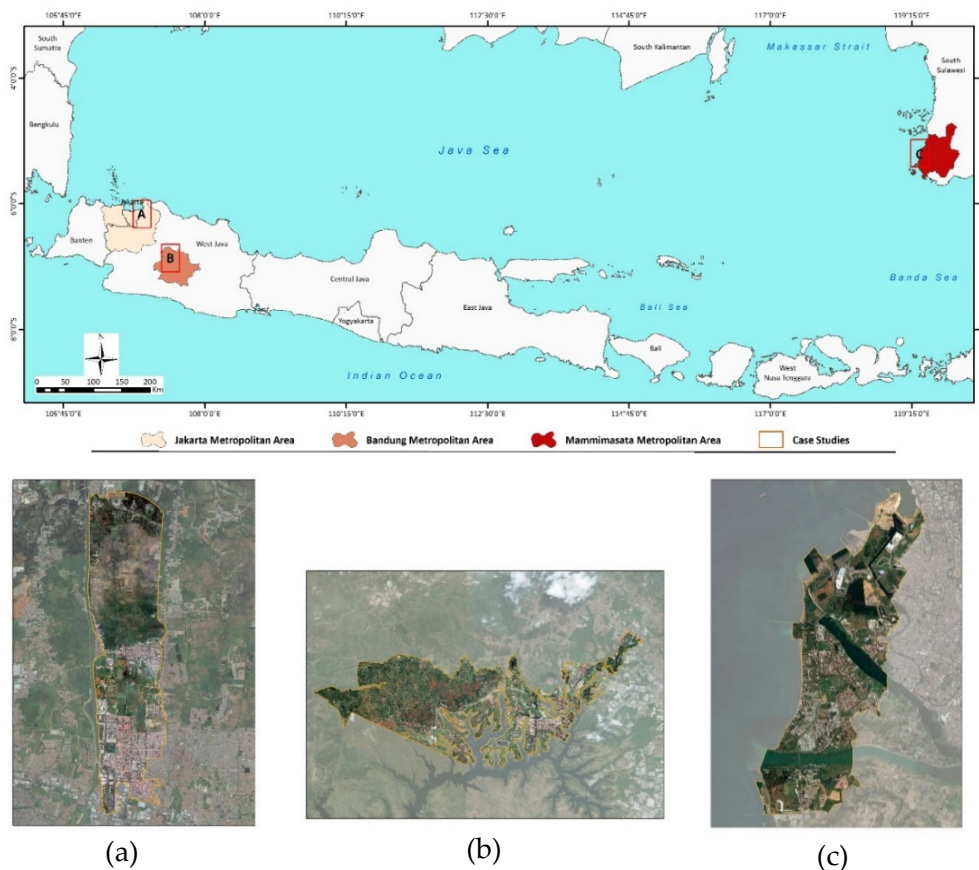
#### 4.1.1. Selection of Case Studies

This research was conducted using a case study of new town development in Indonesia (see Figure 3). It aimed to assess the real condition of property rights transformation of the local communities as a result of the development. Research locations were chosen by considering the characteristics of peri-urban areas where this large-scale land development dominantly takes place. We selected both inland and coastal locations, with different types of economic activities of local people, which is manifest in a different mode of land uses and difference with respect to the bundle of rights [53] (Table 1). In our case studies, we also took account of the long duration of development, i.e., up to 25 years, to fully understand the impact of the development process, i.e., land acquisition. As mentioned by Winarso and Firman [51], large-scale developments often include a gradual land acquisition process. This potentially affects the transformation of local people's property rights in the development locations.

The basic characteristics of the three locations are shown in Table 1.

**Table 1.** Different characteristics of the three locations.

Nu.	New Town	Metropolitan Area	Geographical Location	Livelihood	Year of Development	Area (ha)	Developer
1	Kota Harapan Indah	Jakarta Metropolitan Area	Low land	Farmer and nonfarmer [113,114]	2003 [7]	1400 [7]	PT. Hasanah Damai Putra
2	Kota Baru Parahyangan	Bandung Metropolitan Area	High land	Farmer [115]	1997 [116]	1250 [116]	PT. Belaputera Intiland
3	Metro Tanjung Bunga	Mammimasata Metropolitan Area	Coastal area (Jeneberang Delta)	Fisherman and fish farmer [117]	1997 [118]	1200 [118]	PT. Gowa Makassar Tourism Development



**Figure 3.** Locations of three case study areas: (a) Kota Harapan Indah (KHI), (b) Kota Baru Parahyangan (KBP), and (c) Metro Tanjung Bunga (MTB). Source: Pleiades Satellite Imagery, 2017.

#### 4.1.2. The Characteristics of Land Use in Our Case Studies

Land development is marked by the spatial transformations in the new town development area (as presented in Table 2). Before the development, the majority of the lands in KHI (Kota Harapan Indah) and KBP (Kota Baru Parahyangan) were used for agricultural activity, accounting for 70% and 73% of total land use respectively. MTB (Metro Tanjung Bunga) is situated on the west coast of Makassar city; before the development, 40% of the total area was used as fishponds. People's livelihoods in KHI [114] and KBP [115] are farming; fishing and aquaculture in MTB [117,118].

**Table 2.** Spatial transformation in KHI, KBP, and MTB.

Land Use	KHI		KBP		MTB	
	Before Development 2002 (ha)	During Development 2016 (ha)	Before Development 1996 (ha)	During Development 2017 (ha)	Before Development 1996 (ha)	During Development 2017 (ha)
Water Body	0.66	37.44	0.05	0.76	272.29	151.19
Developed Area	256.02	576.00	77.70	223.25	27.91	356.97
Paddy Field	985.21	547.47	922.99	771.22	157.68	69.56
Under-development area	60.54	60.23	7.99	30.55	150.85	352.84
Mixed Vegetation	97.57	174.88	47.46	202.42	97.90	61.86
Fishpond/swamp	0.00	3.99	0.00	0.00	472.89	164.19
Shrubs	0.00	0.00	79.01	15.72	20.48	43.39
Forest	0.00	0.00	114.80	6.08	0.00	0.00
Total Area	1400	1400	1250	1250	1200	1200

Source: Interpretation of satellite imagery from three different platforms: Landsat-5 Mapper (TM), Landsat-7 Enhanced Thematic Mapper Plus (ETM+), and Landsat-8 Operational Land Imager (OLI).

New town development has transformed the land use to a more urbanised form. Up until 2016, the developed area in KHI expanded by 125%, including residential and supporting facilities. In 2007, the increase of the developed areas accounted for 187% in KBP, and it increased to tenfold, or 329.06 ha, in MTB. At the same time, agricultural and aquaculture lands for fishery have decreased by about 44% in KHI and 65% in MTB. Although the existence of paddy fields tended to represent a huge proportion in KBP, the ownership of the fields had been conveyed to a KBP developer, and the local people only used the lands temporarily.

#### 4.2. Sampling

We employed a purposive sampling method to acquire the entire data. This method is designed to capture information from respondents with some specific criteria involving the people evicted from their land and properties by new town development. Note that, by using this method, the article's findings cannot be generalised beyond the sample. A total of 252 respondents (Table 3) were obtained from three locations of research, following two-stage data collection. First, interviews were conducted with key respondents: local government, the village head, and the head of community groups (*Rukun Warga*) to collect information regarding which people's lands were acquired due to the development. Second, we distributed questionnaires door to door to local people based on the information from the key respondents to obtain information related to property rights. We realise that this method, similar to other nonprobability samplings, is associated with a small number of samples, leaning to data biases. In order to minimise this limitation, the number of respondents was expanded, akin to what some other scholars have done [119–121]. Furthermore, the data obtained should also be normally distributed as a prerequisite for parametric statistic [122,123].

**Table 3.** The number of respondents.

Nu.	Location	Number of Respondents
1	Kota Harapan Indah	80
2	Kota Baru Parahyangan	95
3	Metro Tanjung Bunga	77
Total		252

#### 4.3. Assessing Transformation and Security Level of Property Rights

To find out property rights transformation for the local communities that have been affected by the new town development, the three types of rights (respectively, appropriation rights, ownership rights, and formality of rights) were analysed. We considered the rights over, respectively, residential and cultivated lands. The former is acknowledged as a basic need of the local residents [124], whereas the latter is strongly related to the property on which economic activities are performed [125].

Comparative data analysis took place by using the initial characteristics of property rights and their current conditions during the development. This step was expected to show a change in each category of rights. Furthermore, we assessed the transformation of the property rights security level (Table 4) using a *before–after analysis method*. The following are the steps for this analysis:

**Table 4.** The security level of each bundle of rights.

Appropriation	Level	Ownership	Level	Formality of Rights	Level
Alienation	4	Private	1	Formal	3
Exclusion	3	State	1	Semi-formal	2
Management	2	Communal	1	Informal	1
Access and withdrawal	1	Open-access	1	No right	0
No right	0	No right	0		

1. Identification of the characteristics of the property rights under prior and current development to find out whether a transformation of the rights has taken place.
2. Calculation of the number of changes that took place in each bundle of rights to determine which bundle mostly experienced transformation.
3. Determination of the security level. Each bundle had several categories and different hierarchies of security levels. However, each category has the same score (see Section 4). The hierarchy of each category of the bundle of rights is as follows:
4. Assessment of the security level of each type of property right under current and prior development.
5. Calculation of the overall transformation of security level (appropriation, ownership, and formality of rights) using the following formula.

$$\Delta S = S' - S \quad (1)$$

$$\Delta S = [W_1A' + W_2O' + W_3F'] - [W_1A + W_2O + W_3F] \quad (2)$$

#### Notes:

$\Delta S$  = transformation of property rights;

$S'$  = security level of property rights in current development;

$S$  = security level of property rights in prior development;

$W_{1,2,3}$  = weight per property right (in this research, we assumed that weight of each right is similar = 1);

$A'$  = security level of appropriation in current development;

$A$  = security level of appropriation in prior development;

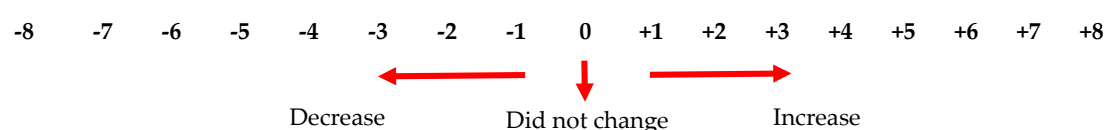
$O'$  = security level of ownership in current development;

$O$  = security level of ownership in prior development;

$F'$  = security level of formality of rights in current development;

$F$  = security level of formality of rights in prior development.

6. Classification of the changes in security levels of combined rights (ownership, appropriation, and formality). The change of security level shows the magnitude of changes in the security level of property rights. Besides the magnitude, the change also considers the direction of the transformation, i.e., increased (more than 0), no change (0), or decreased (less than 0) (Figure 4).



**Figure 4.** Classification of security level transformation of property rights.

#### 4.4. Assessing the Influence of Urbanisation on the Security Level of Property Rights

In order to investigate the influence of urbanisation on property rights, a statistical test was performed. By referring to the discussion in Section 2.1, we considered geographical and socioeconomic aspects to analyse the effects of urbanisation since they impose a direct impact on local people in the development area. These two aspects were categorised into six independent variables: type of lands ( $X_1$ ), land use ( $X_2$ ), land price ( $X_3$ ), occupation ( $X_4$ ), income ( $X_5$ ), and welfare ( $X_6$ ). We used dummy data for  $X_1$ ,  $X_2$ ,  $X_4$ , and  $X_6$ . The dependent variable ( $Y$ ) is the change of security level of combined rights (see Section 4.3).

As a first step, the data set was examined by using the Kolmogorov–Smirnov test to check the data's distribution. The result reveals that Asymp. Sig is 0.0693, which means they were normally

distributed (Asymp. Sig. > 0.05). Further, a multiple linear regression (MLR) was employed to help us in modelling the relationship between the dependent and six independent variables as well as to determine which independent variables in particular influence significantly the dependent variable. Initially, we developed hypotheses on this test, as follows:

H<sub>0</sub>: Urbanisation pressure has a significant influence on the security level of property rights.

H<sub>1</sub>: Urbanisation pressure does not have a significant influence on the security level of property rights.

Data requirements for this statistical analysis are shown in Table 5.

**Table 5.** Data requirements.

Variables		Parameters		
Name	Sources	Name	Sources	Data
<b>Dependent variables (Y)</b>				
Transformation of the security level of combined rights	-	Range of security level transformation	-	Interval (security level of property rights, starting from 8 until -8)
<b>Independent variables</b>				
Type of lands (X <sub>1</sub> )	[59]	Inland Coastal	[59]	1 = inland 0 = coastal
Land use (X <sub>2</sub> )	[59]	Cultivated Noncultivated	[59]	1 = cultivated 0 = noncultivated
Land price (X <sub>3</sub> )	[59,126]	Land price (m <sup>2</sup> )	[59]	ratio
Occupation (X <sub>4</sub> )	[59,126,127]	Agricultural Nonagricultural	[59,126,127]	1 = agriculture (farmers, fisherman and fish farmers) 0 = nonagriculture
Income (X <sub>5</sub> )	[59,126]	Salary (month)	[59,126]	ratio
Welfare (X <sub>6</sub> )	[128]	Income under poverty line	[129]	1 = poor 0 = not poor

These hypotheses were developed by considering a common phenomenon in peri-urban regions that high urbanisation pressure significantly triggers a process of land acquisition [60,129]. This acquisition might lead to the change or even loss of local residents' property rights.

## 5. Findings

This section describes the transformation of the local residents' property rights due to the new town development in the three study cases. In addition, this section also provides the results of multiple linear regression (MLR) that analyses the influence of urbanisation on the local people's security level of property rights over land.

### 5.1. Transformation of Property Rights

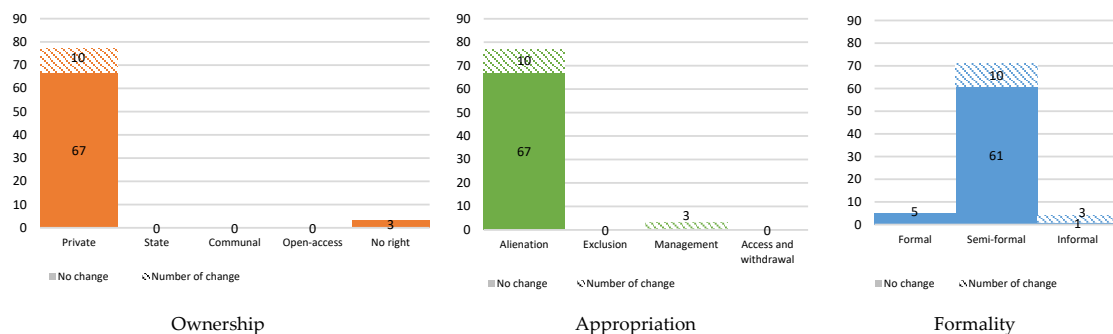
- Kota Harapan Indah (KHI), Bekasi

Eighty respondents in KHI participated in the survey; 58% of them belong to the lowest income category. Before the development of the new town, 80 rights were attached to the land for residential use and 80 rights to cultivated lands. For the cultivated land, in terms of ownership right, most of the respondents have 'no ownership' (53%), while in terms of appropriation rights and formality of the

rights, they were dominated by ‘management’ (53%), and ‘informal’ right (56%), respectively, (Figure 5). With regard to residential land, in terms of ownership right, 96% of the respondents held private ownership for their residential lands, and in terms of appropriation right and formality of the rights, they were, respectively, dominated by ‘alienation’ (96%) and ‘semi-formal’ (89%) (Figure 6). It means that the respondents have more freedom over their residential land compared to their cultivated land, since almost all of them hold the private and alienation right for their residential lands.



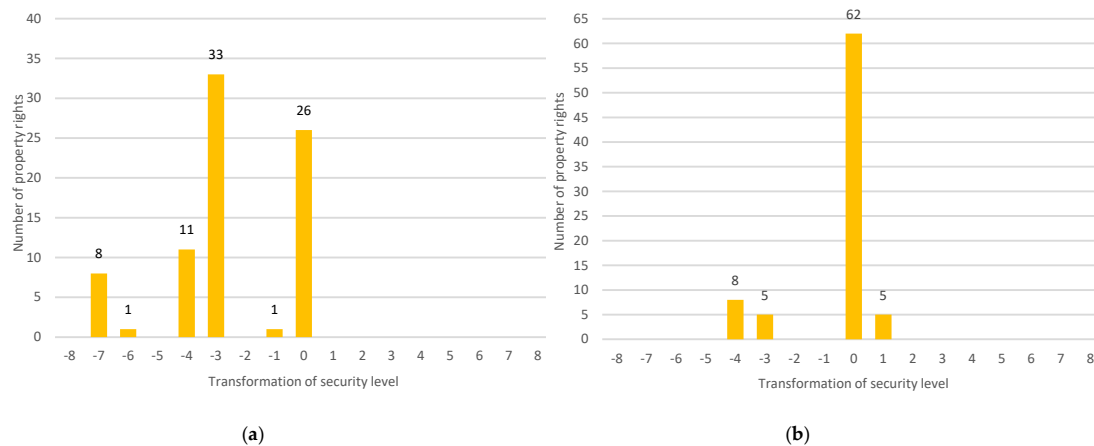
**Figure 5.** The number of property rights transformation on cultivated lands in KHI.



**Figure 6.** The number of Property rights transformation on residential lands in KHI.

After the development of the new town, we found that most of the rights over cultivated land were transformed. In terms of *ownership right*, almost 90% of the ‘private rights’ were changed, while in terms of *appropriation rights* and *formality of the rights*, the biggest transformation occurred for ‘alienation’ and ‘semi-formal’ (Figure 5). A similar trend of transformation for the three categories of property rights also took place on the residential lands (Figure 6).

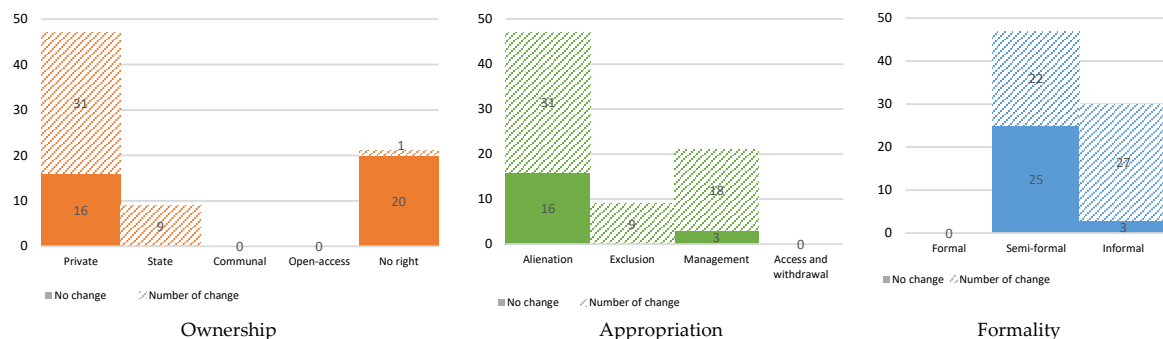
The transformation of the security level of rights after the new town development was more substantial on the cultivated land. As shown in Figure 7a, almost 70% of respondents with cultivated land experienced a decrease in the level of the security of their property rights with the largest decrease of 3 levels. There was no increase in property rights security level for cultivated land after the new town development. For residential land, as shown in Figure 7b, 77% of the respondents experienced a neutral change (the change score = 0) in their property rights security level. Interestingly, 6% of the respondents experienced a slight increase in their property rights security level.



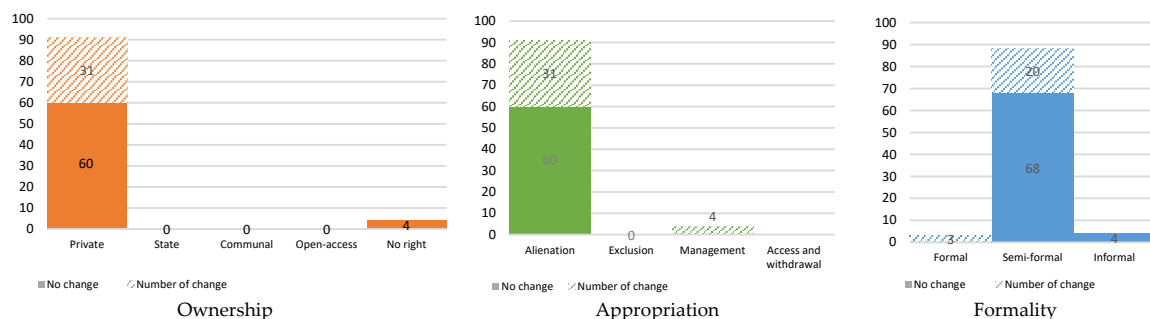
**Figure 7.** Transformation of the security level of property rights in KHI (a) cultivated and (b) residential lands.

- *Kota Baru Parahyangan (KBP), West Bandung Regency*

In KBP, 95 respondents with residential land and 77 respondents with cultivated lands were involved. Before the new town development, the cultivated land was dominated by rice fields and cornfields. In terms of the *ownership* right, most of the respondents with cultivated land held a 'private ownership' (61%), while in terms of the *appropriation* right and the *formality of the rights*, most of them held an 'alienation' and 'semi-formal' right, respectively (Figure 8). A similar situation was also found for residential land (Figure 9).



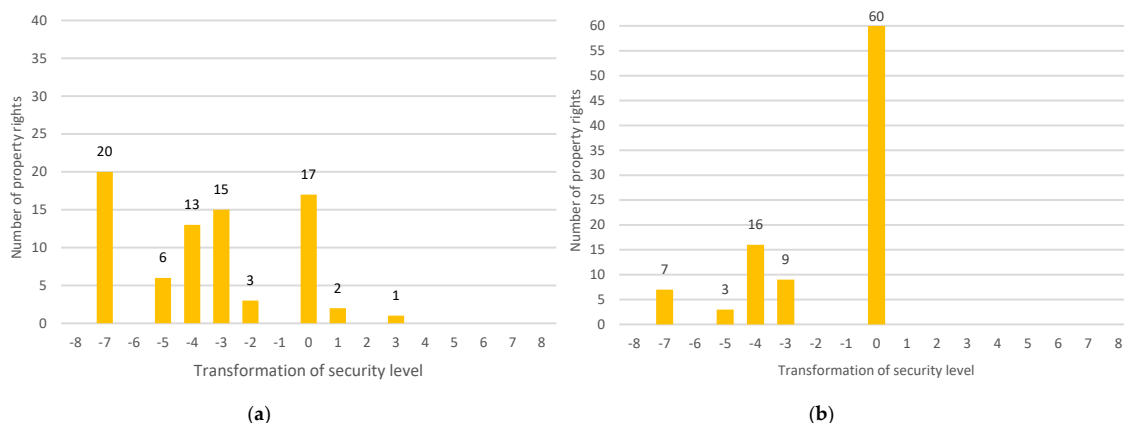
**Figure 8.** The number of property rights transformation on cultivated lands in KBP.



**Figure 9.** The number of property rights transformation on residential lands in KBP.

After the new town development, more than 50% of the property rights for the cultivated land have transformed in terms of all three categories of property rights, while no more than 40% of the property rights for the residential land have changed in terms of all the three categories.

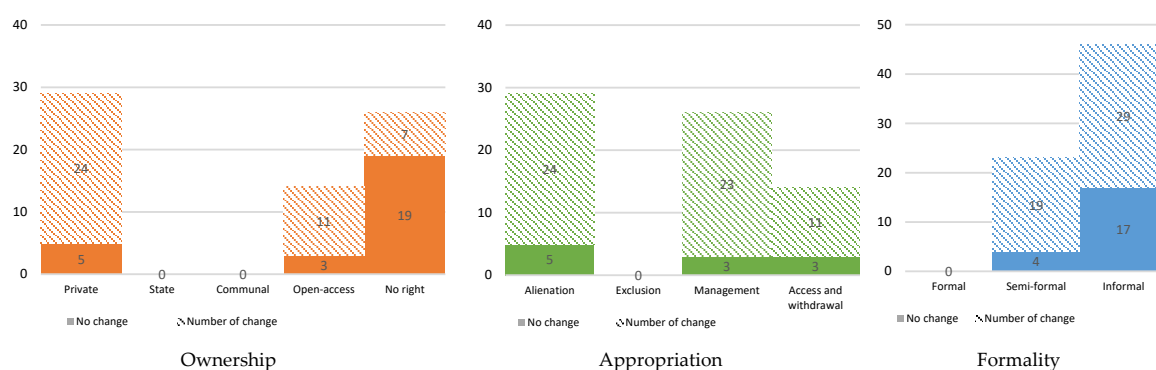
As shown in Figure 10a, with the transformation of the property rights for cultivated land, 57% of the respondents experienced a decrease in their property rights security level with the highest decline of 7 levels. However, a small number of respondents (4%) experienced an increase in the security of their property rights for cultivated land with a rise up to 3 levels. Meanwhile, for the residential land, most of the respondents experienced a neutral change in the security level of their property rights, and none of them experienced an increase of security level (Figure 10b).



**Figure 10.** Transformation of the security level of property rights in KBP (a) cultivated and (b) residential lands.

- *Metro Tanjung Bunga (MTB), Makassar*

In MTB, 69 respondents reported that they had cultivated lands and 77 respondents had residential lands before the development of the new town. The majority of the residents were fishermen or fishpond farmers. In terms of *ownership right*, 42% of the respondents with cultivated land said that they had 'private ownership' rights before new town development which, was the dominant type of rights in this category (Figure 11). Meanwhile, in terms of *appropriation rights* and *formality of the rights*, most of the respondents with cultivated land reported that they had 'alienation' (42%) and 'informal' rights (67%), respectively, before the development. After the development of MTB, 61% of the *ownership rights* over the cultivated lands have transformed, while 84% and 70% of the *appropriation* and *formality of the rights* have transformed, respectively.



**Figure 11.** The number of property rights transformation on cultivated lands in MTB.

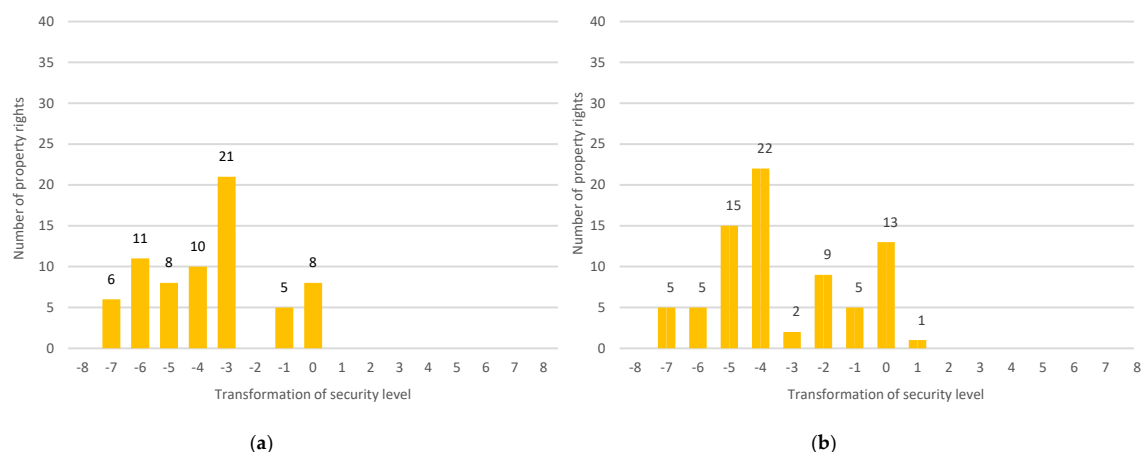
Concerning the residential land, the majority of the respondents (58%) reported that they had a 'private' right for the *ownership* category before the development of MTB (Figure 12). During this time, in terms of *appropriation* and *formality of the rights*, most of the respondents held the 'alienation' right (58%) and 'semi-formal' right (69%), respectively. After the development of MTB, 45% of the

ownership rights have transformed, while 75% of appropriation rights and 64% of formality of the rights have also changed.



**Figure 12.** The number of property rights transformation on residential lands in MTB.

Figure 13a,b demonstrate how the security of property rights for cultivated and residential land has respectively transformed after the development of MTB. It can be seen that most of the rights that have been transformed for both the cultivated and residential land have a decreased level of security. The highest level of decrease for the cultivated land was 3 level, while for the residential land it was 4 level.



**Figure 13.** Transformation of the security level of property rights in MTB (a) cultivated and (b) residential lands.

## 5.2. Nexus between Urbanisation Pressure and Security Level of Property Rights

The population growth and increase of public facilities add to higher pressure from the existing city to peri-urban areas. Consequently, the land acquisition that affected the property rights of the residents in our three cases cannot be separated from the urbanisation process. We presume that different aspects of this process, leading to a transformation of the property rights regime, may cause different effects on the security level of property rights. To facilitate the testing of our hypothesis, a multiple linear regression (MLR) was employed by involving the level of property rights security transformation as a dependent variable and the independent variables representing urbanisation aspects, namely type of land, land use, land price, occupation, income, and welfare (see Section 4.4).

In the first step of MLR analysis, we examined the correlation among dependent and independent variables and performance of the regression model. According to Table 6, the R-squared value shows 0.732. This indicates that 73.2% of the transformation of the security level is explained by all variables related to urbanisation. In addition, the Standard Error of the Estimate (SEE) is lower than the standard

deviation of dependent variables ( $2.295 < 2.417$ ), which implies that this MLR model has an excellent performance in predicting the independent variables.

**Table 6.** Model summary.

Model Summary			
R	R-Square	Adjusted R-Square	Std. Error of the Estimate
0.854	0.732	0.727	2.295

Further, we looked into the coefficients of regression, consisting of  $\beta$  coefficient and significance value. This coefficient explains how and to what extent the urbanisation pressures as independent variables have given an impact on the transformation of security level as the dependent variable. In this sense, the significance of the independent variable is considered when the  $p$ -value is less than 0.050. The regression model results are summarised in Table 7, with the coefficients for each variable.

**Table 7.** Coefficients of regression.

Variables	Unstandardised Coefficients		t	Sig. (p)
	$\beta$	Std. Error		
(Constant)	−2.438	0.463	−5.271	0.000
Inland ( $X_1$ )	−1.181	0.273	−4.321	0.000
Cultivated ( $X_2$ )	0.634	0.240	2.637	0.029
Land price ( $X_3$ )	$-9.101 \times 10^{-8}$	0.000	−0.205	0.838
Agriculture ( $X_4$ )	0.083	0.226	0.366	0.035
Income ( $X_5$ )	$-7.020 \times 10^{-7}$	0.000	−0.793	0.428
Poor ( $X_6$ )	−0.551	0.297	−1.855	0.064

Table 7 shows that three out of six of the urbanisation pressure variables have a significant impact on the transformation of security level of property rights, namely, inland (type of lands), cultivated (land use), and agricultural variable (occupation). Agriculture ( $X_4$ ) has the highest significance with  $p$   $0.035 < 0.050$ , while the type of lands ( $X_1$ ) has the lowest one. Moreover, by referring to the  $\beta$  coefficient, we see that cultivated ( $X_2$ ) and agricultural occupation ( $X_4$ ) have a positive correlation to the transformation, indicating that an increase of the number of cultivated lands and farmers led to a higher value of the transformation of security level: 0.634 points and 0.083 points, respectively. In contrast, inland (type of land) shows an inverse correlation (−1.181) to the change of security level, indicating that the increase in the number of properties in the inland area decreases the security level of property rights concerning the amount of that value.

## 6. Discussion

### 6.1. Transformation of Property Rights Due to New Town Development

In terms of land development, property rights cannot only be understood as a single bundle of rights, but they are also attached to several sets of rights at once, which relates to several parties. Therefore, we have proposed here that the assessment of these rights should be performed by taking into consideration the three bundles of rights, namely, ownership, appropriation, and formality of rights. This is reflected in the conceptual framework constructed in Section 3. This new framework also seems workable and helpful for assessing the property rights transformation regarding new town development, because the framework is capable of comprehensively covering and identifying the characteristics of the property rights in the three locations of study. We considered this as an improvement to current frameworks which only focus on ownership [16], appropriation [29], and formality [37] separately. We then applied this specifically to the case of Indonesia. We found that the characteristics of property rights in Indonesia seem to be well represented in our model. Yet, there

was one category in ownership that could not be identified in the three locations of study: communal ownership (because this tenure system was not in use in the three research locations). Although communal ownership is acknowledged as one of the categories of ownership in Indonesia, in situations where the properties are usually utilised for public facilities such as *waqf* for religious activities [96] or it can even turn to *ulayat* land or *adat* land [130], private ownership is predominant. Private ownership has been promoted by the government with the intention to bring welfare to the people [131].

The characteristics of peri-urban areas as locations that provide large and fertile land have formed a dependence on the people's socioeconomic structure towards natural resources [132,133]. The expansion of urban activities in peri-urban areas, often combined with vast land development, has turned into complicated problems in terms of the continuity of the people's livelihoods. There is much evidence suggesting that, although the locals living in urban outskirts have heavily relied on the availability of lands, their rights to properties are in jeopardy. This issue is apparent in the ownership and utilisation of the properties that are insecure [43,134,135] as well as in the formality of rights [35,115], while the degree of formality plays a central role in providing guarantees for investment values in the transaction of land [80]. Besides the poor economic conditions of local communities, the insecurity of this formality is often overlooked by residents living in peri-urban areas. They are more concerned with maximising the use of land [120,126] rather than holding the lands for economic investment [71].

Unsurprisingly, this condition was also found in the three locations of study: KHI, KBP, and MTB. The initial condition of the rights to the properties held by individuals shows a rather low formality degree. More than 90% of the total property rights were in the category of unregistered rights. In Indonesia, the legality of semi-formal rights stems from the legacy of dualism in the post-colonial land system with different labels in several locations [108]. *Girik* and *Rincik* letters can be widely found, where the former is quite common in Java [109], and *Rincik* is mainly found in Makassar and nearby areas [136]. The characteristics of the property rights mostly found in peri-urban areas reflect poor economic conditions of the locals regarding land registration [111]. Moreover, we also found that, despite similar formality levels between rights over cultivated and residential land, they are different in characteristics in terms of ownership and appropriation. Concerning cultivated lands, the private and alienation right categories are not dominant in ownership right and utilisation. This phenomenon indicates that residents lack full rights to land, such as user rights. As a consequence, they did not get any compensation when their lands were acquired. According to Indonesian Law [137], the compensation given is only restricted to the right of ownership that involves private right, which is mostly associated with alienation right. For residential land, private ownership and alienation rights are dominant. Right holders hold the right to manage their properties in line with their expectation and intention without any interference from other parties. Therefore, these rights give a significant advantage in terms of the guarantee of economic values in land transactions [138] and the sustainability of their livelihoods [128,139].

Along with land acquisition for new town development, the transformation of property rights in the majority of cases led to a change of rights security. Notably, changes in appropriation rights occurred, indicating changes concerning the livelihood of the holders of the rights. Similar changes in livelihood conditions were found in other studies in Global South countries [60,114,132,133].

Additional findings also underline that the rights on cultivated land are easily exposed to the effects of new town development, resulting in substantial decreases in the security level, compared to the changes in security levels for property rights concerning residential use. We assume that this is triggered by lower land prices [111], 'easier' land acquisition [134], as well as lower servicing costs [52]. Moving to residential land, we noted that, in total, 172 properties have been acquired, but only in 37% of these cases, this led to a decrease of security level.

## 6.2. Effects of Urbanisation on the Change of Property Rights Security

The dynamics of the growing population and the development of activities in the existing city have stimulated the expansion of urban activities to peri-urban areas. This major expansion may have been caused by urbanisation pressure consisting of geographical, economic, and social aspects [58–62,126]. This research aimed to verify to what extent urbanisation pressure variables have impacted the security level of the residents' property rights over land. The results of our statistical analysis indicate that three out of six variables related to urbanisation pressure tested show a significant influence on the change in the security level. They are land use, occupation, and type of lands (Table 7).

Land use seems to be the most significant variable influencing the change of security level. Statistically, it also reveals a positive correlation to the change of security level. The more cultivated lands, the stronger the possibility there will be of a change of the security level. The trend of change of rights in cultivated and residential land in the three locations are 65% and 35%, respectively. The 30% gap indicates the high penetration of large-scale land development which converts productive cultivated lands in peri-urban areas [16,24], most of which are owned by local residents [24,48].

Occupations related to agriculture, e.g., farmer, fisherman, and fishpond farmers, also gives a positive correlation with the change of security level. Referring to Section 5.2, 75% of rights held by farmers, fisherman, or fishpond farmers experienced a substantial decrease in their security level. This finding also asserts that activities in peri-urban areas which heavily rely on agricultural activities [132–134] are prone to changes in the security level compared to nonagricultural activities. Farmers tend to easily release their land due to low crop productivity and income [126]. Moreover, in the three locations observed, more than 50% of the locals were holding rights over land where there is a greater chance for a security level change to take place [16]. This led to the significant influence of occupation on the change in security level. In addition, local residents in peri-urban areas tend not to fully understand the benefits of a high security level of their property rights. As long as property rights can provide economic benefits, security levels tend to be ignored [91,140].

On the contrary, although 'inland area'—an area that is experiencing the most considerable pressure of the development [55]—gives significant influence to the change of security level, this "type of land" shows an inverse correlation to the change. This result proves that not all of the variables which link to the triggering of massive land development [51] have a direct correlation to the transformation of property rights security. Statistically, properties located in inland areas reduce the possibility to change property rights security, whereas the ones in coastal areas receive a more significant change of security level. This is caused by the different livelihoods of local residents: the residents in MTB lose their rights at once as a result of the new town development, since access to the sea is blocked, or the ponds have been taken.

## 7. Conclusions

This paper has addressed two interrelated issues: the impact of large-scale land development on the transformation of property rights and their security level, and the influence of urbanisation pressures on the change of security level of local communities' property rights over land. We began with developing an alternative framework to assess the characteristics of property rights, particularly in terms of land development. This framework could comprehensively describe the rights embedded in certain land or other properties by considering three bundles of rights: appropriation, ownership, and formality of right.

We applied this framework to investigate the influence of large-scale urban development on the local communities' security of property rights over land. The empirical evidence indicates that the degree of formality of property rights in peri-urban areas tends to be rather low in the period prior to new town development, particularly with regard to property rights over cultivated lands. The results of our study also support findings of previous studies emphasising that poor economic conditions and lack of understanding about property rights security hamper the process of legalisation of formal rights. Along with major large-scale land development, the acquisition of the properties of the locals

has caused a significant change in their rights. Rights over cultivated land seem more vulnerable to transformation because of lower market value and lower servicing costs. Furthermore, security levels over property rights were affected by several aspects of urbanisation processes, particularly ‘land use’, ‘occupation’, and ‘type of lands’.

In sum, the research results implicitly show that property rights and their security level have a strong relationship with the livelihood of selected local communities in our three research locations. This leads to additional research questions; for instance, what the impact is of the transformation of property rights and related security levels on the quality of the local residents’ life.

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