

# Land Readjustment to Support Peri-Urban Settlement Planning in Kigali City — “How Land Readjustment Is Done in Kigali, and Why It Is Done So?”

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**Abstract:** Spatial plans are prepared to regulate land use changes, utility provision, and the related redistributions of land use and rights in the course of urbanisation. The implementation of settlement plan requires in most cases the use of land readjustment which in turn interferes with land rights in case of land acquisition and reallocation. It is important to understand the processes of land readjustment taking into consideration the local context. Therefore, the main aim of this study was to investigate the process of land readjustment in Kigali city with specific focus on how land readjustment is done in Kigali and why it is done the way it is done. Nunga site in Kigali City was chosen as the study area. During the preparation of its settlement plan, new regular and equal sized parcels were drawn, which left space for utilities, green spaces and recreational places. Landowners were asked by the district to implement the plan themselves in two years which resulted in many people to sell their land. To investigate how land readjustment is done in Kigali and why it was done that way, a mixed method approach was used: qualitative, quantitative and GIS methods. It was found that the private company designed the plan, demarcate the plots and construct roads hoping to get the payment from the development fees paid by the buyers of the land in the site. Land was acquired and redistributed to owners as per the plan; a big number of new residents came to settle in the site while some residents who used to live in the site left. As proposed by the district, land readjustment turned out to be self-financed. The process of land readjustment in Kigali was relatively straight forward, in two years only; the plan was implemented as expected. Different factors are behind this success, among them, the availability of cadastre covering the whole country; the trust that the government has built to its citizens; the enforcement of developmental policies by the government; and the promotion of legacy and sovereignty by the government of Rwanda were the main factors. However, the process of land readjustment in Nunga site differs from standards of land readjustment according to UN-Habitat, mostly on compensation and cost sharing which were missing in Nunga site.

**Key words:** land readjustment, settlement plan, peri-urbanisation, peri-urban settlement plan, plan implementation

## 1. Introduction

Cities of the world are recognizing enormous growth. Currently, 55% of the world population lives in cities, and it is projected that 68% will be living in the cities in 2050 [1]. The core city in many countries is overloaded, and the urbanisation is oriented towards the peri-urban areas. The peri-urbanisation process implies dynamics

in land acquisition for housing and infrastructure development which in turn brings excessive land use changes.

Peri-urbanisation creates the need for new utilities to serve the new urban area. The settlement area is expected to have basic utilities essential to sustain life for inhabitants. Important basic utilities to keep the settlement habitable include roads, sanitation facilities, water facilities and electricity [2]. In peri-urban settlement processes, land is acquired by the government or investors to set up utilities in the area or inhabitants organize themselves in provision of utilities or through informal supply of utilities as Hossain (2013)

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[3], for example, describes in the case of Dhaka, where local leaders and well-positioned residents organise themselves and supply the water in the informal settlement unconsidered by the government. As a result, the provision of utilities also affects land rights due to the fact that utility provision and land use patterns shape each other [4] and the impacts of human activities in changing the landscape is associated with changes in the cultural landscape [5].

Planning and policy instruments are intended to regulate land use changes, infrastructure development, utility provision, and the related redistributions of land rights and uses in the course of urbanisation. For example, master plans and comprehensive development plans may be prepared by urban and regional planning agencies for specific peri-urban areas, the city or whole metropolitan regions. However, the process of plan implementation is often hampered due to the question of land rights in land re-adjustment.

In many peri-urban areas, land is divided into many small, irregularly shaped and sized plots with different landowners having different interests in land. This structure is a challenge to physical development with reference to planning guidelines. Land readjustment aims at reorganizing the land use and rights patterns in an area by merging parcels, installing roads and sewage system, and reserving land for public spaces like recreation, schools and other infrastructures. The idea is to redistribute planned land back to the original owners. Land readjustment provides the room for consulting and negotiating with landowners, rather than forcing them to sell their land. Again, land readjustment provides the rights of return to the landowner even though it may not be the exact original location; there is an opportunity for landowners to remain in the same neighbourhood and maintain their social links. The final step is land re-allocation, where a smaller plot, but of higher value, is returned to the landowners according to the size or value of the land that was initially contributed. The difference in value between serviced and un-serviced land is often enough

for landowners to accept reduced land sizes [6]. Landowners contribute more by accepting to reduce their land to cover the cost of the project; the deducted portion of land is sold at the end of the project to pay for planning, administration and construction costs. Then, the remaining land is allocated to the landowners based on their shares in the project. The reallocation process is area or value-based [7].

Land readjustment process should be self-financed. There is no standard for who pays what and who gets what. However, the costs and benefits should be fairly and equitably distributed. Land is divided into three categories to calculate the project costs: land to reallocated back to the original landowners; land reserved for infrastructures and public space; and land reserved for the district to cover the cost of the project [8]. It was argued by Adam (2019) [9] that land readjustment is built in self-finance or partial-finance process; it is an effective tool for financing urbanization. After land readjustment takes place, landowners receive back land that is suitable for development; for landowners whose land reduced a lot, they get cash as compensation [10]. Land readjustment should in theory result in a situation where everyone benefits. Landowners benefit from increased land values and the government gets a well-planned settlement without the compulsory land acquisition of land. However, land readjustment is relatively complex and requires reliance on strong local governance systems and the context of land administration of the country. This is why some developing countries are unable to implement land readjustment in practice [6]. For example, the inefficient land information management, lack of public support and ineffective land reallocation have affected the effectiveness and efficiency in land readjustment in Turkey [11]. It was argued by LeRoy (2012) that in developing countries land readjustment is hampered by the fact that public participation is not integrated with urban planning and there are weak land records. In China, major problems faced in land readjustment are related to the land

valuation; landowners tended to overvalue their land. And the issue of land reallocation which was time-consuming to agree with people on allocated land after re-parcellation [12].

Due to a high displacement of people to the peri-urban areas, the cities in Rwanda elaborate the settlement plans and enforce its implementation as the tool to manage the peri-urban settlement processes. The settlement plan is the detailed plan of an area zoned residential in the overall city master plan; the details include the parcellation, utilities paths, the type of housing required, the green spaces reserve and the recreational areas. The implementation of settlement plans led to land readjustment process which interfered with land rights in land acquisition and reallocation. For example, boundaries and structure of parcels have changed to give away the paths for utilities and to accommodate many people on small land, or some people were displaced in land readjustment process. In Nunga site, the land readjustment was done in only two

year and the approach used is quite different from the one proposed by UN-habitat due to many reasons. This paper explains how land readjustment is done in Kigali and why it is done so.

## 2. Methods

This paper was developed based on the author’s MSc thesis research [13]. However, this paper answers two questions based on the findings from that MSC thesis and additional literature review. Those questions are the following: (1) how land readjustment is done in Kigali City? (2) Why land readjustment is done so in Kigali City?

### 2.1 Study Area Background

For this research, a study area was identified in Kicukiro District which is one of the three districts composing Kigali city in Rwanda. The study site is called Nunga and it has the size of 70.9 hectares. The map below shows the location of the study area.

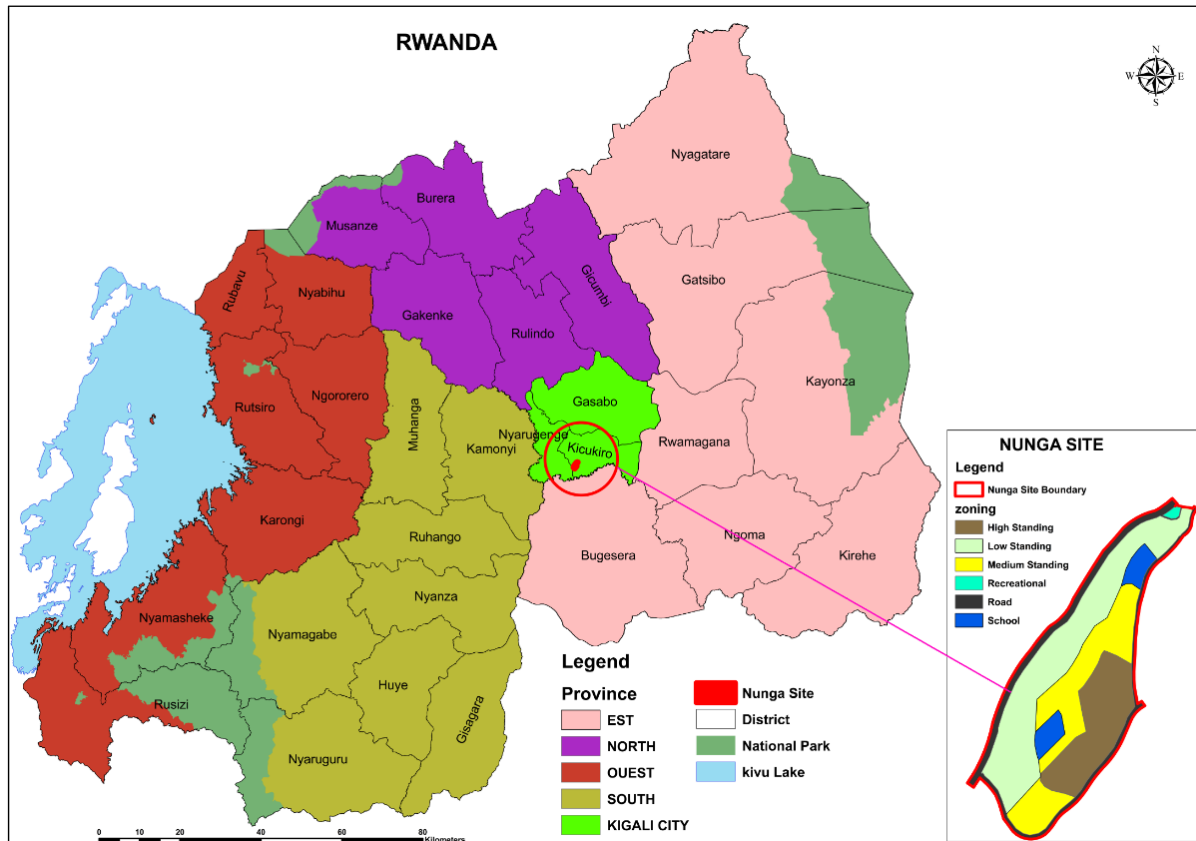


Fig. 1 Study area map.

The study area was chosen based on merit for its special preparation and implementation of the settlement plan. Nunga site was zoned for agricultural use in the overall Kigali masterplan. The settlement plan is in line with the overall master plan that gives more details for the zoning of the master plan to enable implementation. However, the district together with the city of Kigali chose to change Nunga site from agricultural use to residential zone, because of housing needs in Kigali; and they chose this area because it is strategic and was less inhabited compared to other areas in the district. So, the cost of redevelopment is less than a densely populated area. The study area site had many individuals owning different pieces of land. The structure of the parcels was a challenge to the orderly development of the site. Therefore, a settlement plan that requires land readjustment was prepared and implemented in Nunga site. During the preparation of the plan, new regular and equal sized parcels were drawn which left space for utilities, green spaces and recreational areas. The objective of the district was to see a properly planned settlement able to accommodate a big number of people on a small piece of land, with all parcels accessing road, connected to electricity and water. What is notable about this project is that landowners were asked by the district to lead the implement the plan, an approach which the district referred to land readjustment with “participatory approach”. As a measure to ensure implementation of the plan, landowners were given two years for implementation which resulted in many people to sell their land.

## *2.2 Data Collection and Analysis*

This research used a mixed method: qualitative, quantitative and GIS methods.

Qualitative method involved expert interviews with professionals in urban planning and land administration fields in Kigali as well as a focus group discussion with the committee representing people in the resettlement process. Nine expert interviews were

conducted; experts from the City of Kigali (CoK), Ministry of Infrastructure (MININFRA), Rwanda Housing Authority (RHA), Kicukiro District, Rwanda Land Management and Use Authority (RLMUA) and Geo-info Africa Ltd. (the private company who designed the plan) were interviewed. The qualitative method revealed the practices in land acquisition and reallocation, the information needed to implement land readjustment, the stakeholders in land readjustment and their level of participation. Content analysis was used to thematize information from expert interviews and focus group discussion, and Atlasi.ti. software supported the analysis

The quantitative method involved questionnaires which allowed to gather individuals’ perception on land readjustment processes. Two categories of people were differentiated to see the impact of the plan on the neighbourhood: old residents, who lived in the neighbourhood before plan implementation, and new residents, who acquired plots and houses in the course of plan implementation. 41 new residents and 60 old residents were used as the sample size to administer the questionnaire. Descriptive statistics using frequency counts and ratio were used to analyse individual responses; and SPSS software supported the analysis.

GIS method involved land use change mapping; and the spatial analysis of the plan and the cadastral map. Orthophoto, satellite images, the plan and cadastral parcels layers were used to map landuse changes and to analyse changes in parcel structure. Landuse classification was used to map landuse changes during the implementation of the plan; and the overlay analysis was used to analyse change in parcels structure during the implementation of the plan; and ArcGIS software supported the analysis.

## **3. Results**

### *3.1 How Land Readjustment Is Done in Kigali City*

The experience from Rwanda shows that land readjustment is initiated by the district and proposes the

approach to land assembling and reallocation, and the landowners become the partners in developing their area. The process used in land readjustment of Nunga site was quite new in Kigali, and the other sites are now taking Nunga site approach as a model to implement the settlement plans of other peri-urban areas of Kigali.

After the selection of Nunga site, the district hired the private company (GeoInfo Africa Ltd.) to design the plan that will accommodate many people of different categories in income. The plan was prepared, and the district called upon a first meeting to present to the residents the plan and to get their feedback. From the meeting, a committee representing landowners were elected to facilitate the implementation of the plan and to represent people's interests in the implementation of the plan. The elected people are people with influence in the society and local people trust them. The committee committed to do the voluntary work without payment.

The district brought the plan and proposed the approach to implement it. Because there was no budget at the district level, the power to implement the proposed approach was given to the elected committee. The approach was to use land readjustment process to develop the settlement. Land readjustment calls upon land consolidation, land reallocation and land registration; and the finance component of it.

The land readjustment started by the committee collecting hardcopy of land titles to merge all the parcels in the cadastre. Hand in the land titles by the landowners was considered as a sign of commitment to the land readjustment and the terms of the plan. Hardcopy of land titles were submitted to the district which in turn sent to the land agency after review. The land agency merged the parcels and the area become a single parcel with owner the district representative (Executive secretary), here 392 parcels were merged. The plots designed in the plan by the private company was used to subdivide the cadastre and come up with the parcels proposed in the plan, here 1317 parcels were created in the cadastre and at that stage still, the

owner of all parcels was the district representative. It was possible to write the name of the owners based on previous parcels, but the purpose was for people to sell plots from their land and keep only one. After re-parcellation, the land agency prepared the map including the cadastral parcels before and after to be used by the district and resettlement committee to reallocate land to owners. The map was used for physical demarcation of the plots with owners of plots being present. People identified what happened to their lands and beacons were installed for each plots' boundary. After all landowners knew where their plots start and end, they decided which plots to sell and which plots to keep depending on how many plots were created from their land. Depending on the size of the land, the owner could register all plots from his/her land. However, the idea was to accommodate many people on a small land, so, the owner was supposed to sell other plots and keep one. If the owner decides to keep all plots from his/her land, he/she can pay development fees for more than one parcel and develop all of them. However, old landowners were not supposed to pay the development fee; this was done to facilitate the landowners because the plan finds them there. If the plot combined portions of land from different owners, the cadastral map provided the size that each owner has contributed, and the committee recorded all of them to share the money from the sales, or one of the owners kept the land and paid out others' portions. After registration, new land titles were given to owners. And start developing the sites according to the plan.

The reallocation of the land was not based on the size each contributed to the land consolidation. Landowners identified how the boundaries of their plots changed and kept the remaining land at the same location. This means that landowners got the reduced or the entire land at the exact original location of the parcels, depending on whether the land was affected or not by utility provision. Land for utilities was taken

from landowners, however, it was not a systematic reduction to all landowners.

Regarding, the financing of land readjustment, it was proposed by the district that the land readjustment will be self-financed. Nunga land readjustment project needed money to pay the private company who prepared the plan, to pay for beacons installed in each plot, and to pay for utilities provided in the site (road construction, electricity, and water installation). It was calculated and decided that everyone who buys the plot in Nunga shall pay the so-called development fees equivalent to 380,000 Rwandan francs (\$420). Again, all buyers were given two years to build the plots according to the building design in the plan. The process in land registration was designed in a way that the private company formally gets their money; the buyer gets the sale agreement signed by the owner of the land, the resettlement and local authorities. Then, the buyer went to the company to acquire the cadastral plan of the parcel “fiche cadastrale” which is submitted to the land agency in order to get the new land title. For the buyer to get that cadastral plan of the parcel, he/she has to pay that development fee from which the company got their money; this is how Nunga site land readjustment was financed.

Concerning the participation in land readjustment, I used five levels of participation as described by Arnstein (1969) [14] in his paper “A Ladder of Citizen Participation” to assess people’s participation in Nunga settlement plan preparation and implementation. Arnstein’s levels were translated into the specific context of the study, from the high to the low level of participation: (1) landowners take the lead in the implementation, (2) landowners delegate majority representatives, (3) land owners advise the officials but they judge the feasibility and take decision, (4) officials held meetings with landowners but it was not clear if landowners’ input was considered, (5) landowners were informed but there was no room for feedback. The results revealed that the level of participation in plan preparation was low where the majority of respondents

reported that the participation during plan preparation was limited to the officials holding the meeting and hearing from people, but it was not clear if and how peoples’ input was considered in plan preparation; this is the second lowest level of participation on the ladder. The low level of participation was also confirmed during the focus group discussion with the resettlement committee, where the participants said that the district held meetings with residents and explained about the plan that had already been developed. According to one committee member: “we did not prepare the physical plan, the district thinks on our behalf for the development of the site and the district in general, we were not aware of anything, they came to us with the draft plan in the first meeting. However, we were invited to the validation meeting of the final plan and we gave some comments to improve.” However, during the implementation of the plan, the participation level has increased. The majority of respondents said that landowners elected the committee to represent them in all activities related to plan implementation. This is the second to the highest level of participation on Arnstein’s ladder. This is also in line with the aims and expectations of the government, who wanted to prepare the plan, but wanted local people to elaborate a strategy of implementation and take the lead in the implementation process. In addition, the whole process of land readjustment implementation was appreciated by the majority of respondent, where 79% of residents responded that they are satisfied with the process of land readjustment used; and 87% of residents are happier now than before the plan implementation of the plan.

In a nutshell, land readjustment was done in way that landowners were informed about the plan, the private company designed the plan and construct roads hoping to get money from the buyers; buyers paid the development fees to pay back the company, and in turn, the district facilitates the landowners to get the new land title, the architecture design of the houses and the building permit.

Does the approach used in land readjustment of Nunga site reflect the local context? I found it important to explore why land readjustment was done the way it is explained in this section. The following section describes in details the reasons.

### *3.2 Why Land Readjustment Is Done So in Kigali City?*

Many factors influenced the approach to use in land readjustment process of Nunga site.

According to the district planner, the lack of financial resources at the district level is behind the choice of the approach used in land readjustment in Nunga site. There was no budget to finance land readjustment in Nunga site. But the budget turned out during the implementation of the plan where landowners financed the project with more or less forced about this solution. For some government officials it was a win-win situation where the government settled people in a planned manner without the budget, and the value of the land increased with access to the infrastructures. Other government officials also considered it a kind of best possible arrangement noting that, “it is the responsibility of the government to provide utilities to people because they pay taxes, I consider what was done in Nunga as kind of arrangement.” Others said that the lack of money for expropriation had pushed the district to come up with that idea and at the end it has worked because the value of land has increased.

What is surprising is the way this plan was implemented too fast. People were consulted at the stage of implementing the plan. However, in only two years, land was consolidated, merged, reallocated to the previous owner; and houses and road were constructed. According to the resettlement committee, there was no resistance from the owner, no riots and no case in court. But on the other hand, some people had to sell their land and relocate elsewhere depending on different factors. I wanted to explore what makes this

possible. Some literatures were consulted and some responses from expert interviews were discussed.

It was found that the land readjustment was implemented too fast because of four main reasons: (1) the availability of the cadastre in Rwanda, (2) the trust that people have to their government, (3) the enforcement of developmental policies in Rwanda, and (4) the political context of legacy and sovereignty in Rwanda.

- 1) Rwanda has completed the registration of all parcels, more than 11 million of land parcels are now registered in the land information system managed by the land agency of Rwanda [15]. The cadastral information is now helping different planning domains. Without the cadaster, resettlement would have taken many years.
- 2) The government of Rwanda has built the trust to its citizens [16, 17]. Through the leadership of President Paul Kagame, leaders were instructed to serve people for the development of the country; the culture of accountability has increased overtime and has given way to the trust of the government by people; every year local leaders make the oath before the president for the actions to be taken during the year for accountability purpose, and fulfilling them under the performance contract [18]. The accountability in leadership has increased the trust of the government by its people.
- 3) The government is very sensitive to the policies for developing the country. This was argued by by Kelsall (2016), where he mentioned Rwanda in countries with inclusive, coordinated and impersonal government to mean that the most important leaders are incorporated and coordinated around a common purpose. Rwanda has taken many development initiatives despite its horrifying history. In 2004, the government adopted the land policy to regularize land ownership; and later in 2015 the

urbanization policy was adopted to promote urban development that enhances national and local economic growth and ensure good quality of life for everyone (MININFRA, 2015). The Government of Rwanda (GoR) recognizes urbanisation as a vehicle for post-war reconstruction and the possible resource to unlock the transformative economic opportunities for growth and poverty reduction. Therefore when it comes to the implementation of policies, the government enforce that, this is demonstrated by the quotes from one official from the City of Kigali: “we cannot advance in development if we do not take serious measure for our city to be great. We have stopped the streets market for our city to be clean, of course, some people were affected but we are looking for the development of the country in general. And you can see the results, as a matter of fact, you can read many international reports and see the ranking of Kigali in safe, clean and beautiful cities. If you also take the example of health care, if the government had to wait for all people to understand the benefit of *mutuelle de santé*, I am sure more than 90% of our people would not have insurance. This is why we have to take the measures for our people and decide on their behalf”. This quote from the official shows that a kind of enforcement to developmental policies are done in Kigali. In Nunga site, people were informed after the settlement plan was prepared. The benefit of implementing the plan was explained and people accepted because it was the initiative of the government. However, some people left the site after or during its development.

- 4) The mind set of legacy and sovereignty is being promoted by the officials in Rwanda. People are encouraged find solutions to their problems themselves without always waiting for donors. Fortunately, people have started to develop that

mind set. This is demonstrated by the fact that during the implementation of the settlement plan, the resettlement committee (representative of people) has committed to do the voluntary work of collecting the land titles, leading land reallocation and following up all the issues in land readjustment because there was no budget from the government for that. One of the member of the resettlement committee said: “we were voted to represent and facilitate people voluntary, we did not ask for payment, we have done this to serve the country and we understood the benefit for our site to be developed. People trust us because we are among them and we also have the land in the site too. We should not always wait for someone else to do the job for us; we are able to do most of the things ourselves”. This shows the degree of commitment though there is no payment for the work done.

Though the approach used in land readjustment is so far relatively straightforward, and the reason for its success is demonstrated. The land readjustment in Nunga site has brought so many impacts detailed in the section below.

### *3.3 Effects of Land Readjustment on Patterns of Peri-Urbanisation in Kigali*

The effects of land readjustment on pattern of peri-urbanisation in Nunga site was explained in the context of changes in neighbourhood characteristics, landuse change, changes in parcel structure and land rights changes.

Nunga site was inhabited by 400 people before the implementation of the plan while nowadays it is inhabited by 1117 people, from which 294 are old and 823 are new. It means that 106 people moved from Nunga site. With the influx of new residents, the neighbourhood composition has changed. The settlement plan has brought many changes in Nunga neighbourhood identity. Some residents have relocated



but many new residents moved to the site, and the number of inhabitants has increased. While old and new residents are relatively similar in age distribution, the levels of formal education and income are higher for the new residents. This indicates that the site has gone through a gentrification process, which ended in some people leaving the site. Old residents who are still living in the site and resettlement committee were asked about what could be the reason for people to leave the site during the implementation of the plan.

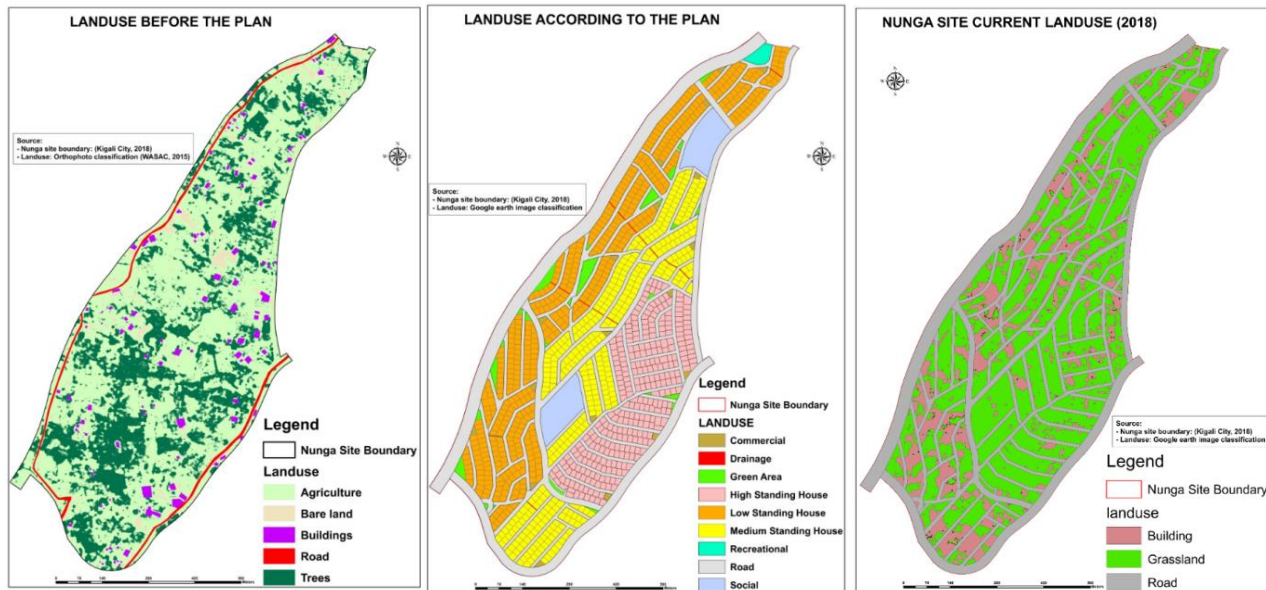
According to residents, there are three main push factors; while the committee emphasized on one of them. The current residents explained as most important reasons for neighbours and other old residents having left the area the following: (1) the inability of local people to comply with the requirement of the plan (types of houses proposed); (2) people who wanted money to start a new life elsewhere and (3) people who had no other options and had to sell their land (i.e., change of primary activity, and/or the plot is planned for social facilities like school). Regarding the first main reason, it was found that 63% of respondents think that the main reason for people to leave the site is the inability to comply with the requirement of the plan. The plan proposed three categories of buildings in the neighbourhood; high rise buildings which are buildings with higher than four floors, mid-rise buildings with one to four floors and low-rise buildings with ground floor only. Regarding the second reason, the majority of Nunga site inhabitants before the plan were low income. During the implementation of the plan, some residents got enough money to start life elsewhere depending on the size of land they had. Therefore, they wanted to get profit from their land, and they chose a suitable place for them to start new life. This is the second push factor. The third reason, 7% of old residents said that people who left the site did not have other options because their normal lifestyle was disturbed. For example, some people were farmers and they cannot practice agriculture in the residential area. And lastly, 4% of

respondents gave other answers like: “I do not know the reason; people who left have their own reasons; people who left did not understand the benefit of the plan.”

The main reason given by the resettlement committee on the push factors corresponds with the third reason found during the questionnaire administration with residents. For the committee, the most important reason to leave the site is land use change “the area changed from agriculture to residential, and most people were farmers. So, tell me what a farmer can do in this site? It is better to go where you can still farm if it is your main activity.” said the committee. Therefore, some people who only practice agriculture sold their land and moved to rural areas where they can buy enough land to continue their activity. Though the plan was prepared to accommodate people of different income, and all residents to stay in the site; it was revealed that some people could not afford staying or felt a sense of social differentiation related to the category of income and decided to leave the site. It was also confirmed by the quote from the official from the city of Kigali, “when we make the plan, it increases the value of the land and the place becomes super standard. Low-income earners find themselves no longer fitting in the area, and mostly move to slums or rural areas. This is a major challenge that we are facing because we intend to develop an area affordable to all citizens, but eventually, we later find that people were displaced, and the new rich people occupied the area. This is something that we cannot stop because the land market is free, you are free to sell your land anytime”. The government has tried to find alternative solutions for urban redevelopment by adopting other approaches rather than expropriation. However, if some people have to relocate, the impact is the same as expropriation. In Nunga it appears that so far relatively few people moved compared to the number of people who stayed based on this study’s findings, but “there is no fixed number yet about people who displaced because the plan implementation is still

ongoing, but we can say that 30% of residents have already gone” said the committee during the focus group discussion.

Changes in neighbourhood composition were associated with changes in landuse. Maps comprising landuse before the plan, landuse in the plan and landuse after the plan were prepared.



**Fig. 2 Landuse changes during the implementation of the plan.**

The results show big changes in landuse; the dominant landuse was agriculture before the plan but the plan did not reserve land for agriculture and the actual uses do not comprise agriculture in the site. Buildings were relatively few and scattered; and the site overall was nestled between two roads that lead along the NW and SE edges of Nunga settlement. The landuse according to the plan shows that the dominant landuse is residential housing which combines high standing, low standing and medium standing housing. There is no land zoned for agricultural use, but several roads have been planned, both larger main roads leading through the settlement as well as side smaller roads. Planned commercial areas are relatively evenly spaced across Nunga; and the land is reserved for two schools and green areas. The current landuse shows that already land occupied by buildings has increased in comparison to the land use before the plan implementation, especially in the south and southwest of the settlement. Roads have also been put in place. Still, the dominant landuse is grassland. This is because agriculture is no longer allowed because of changes in

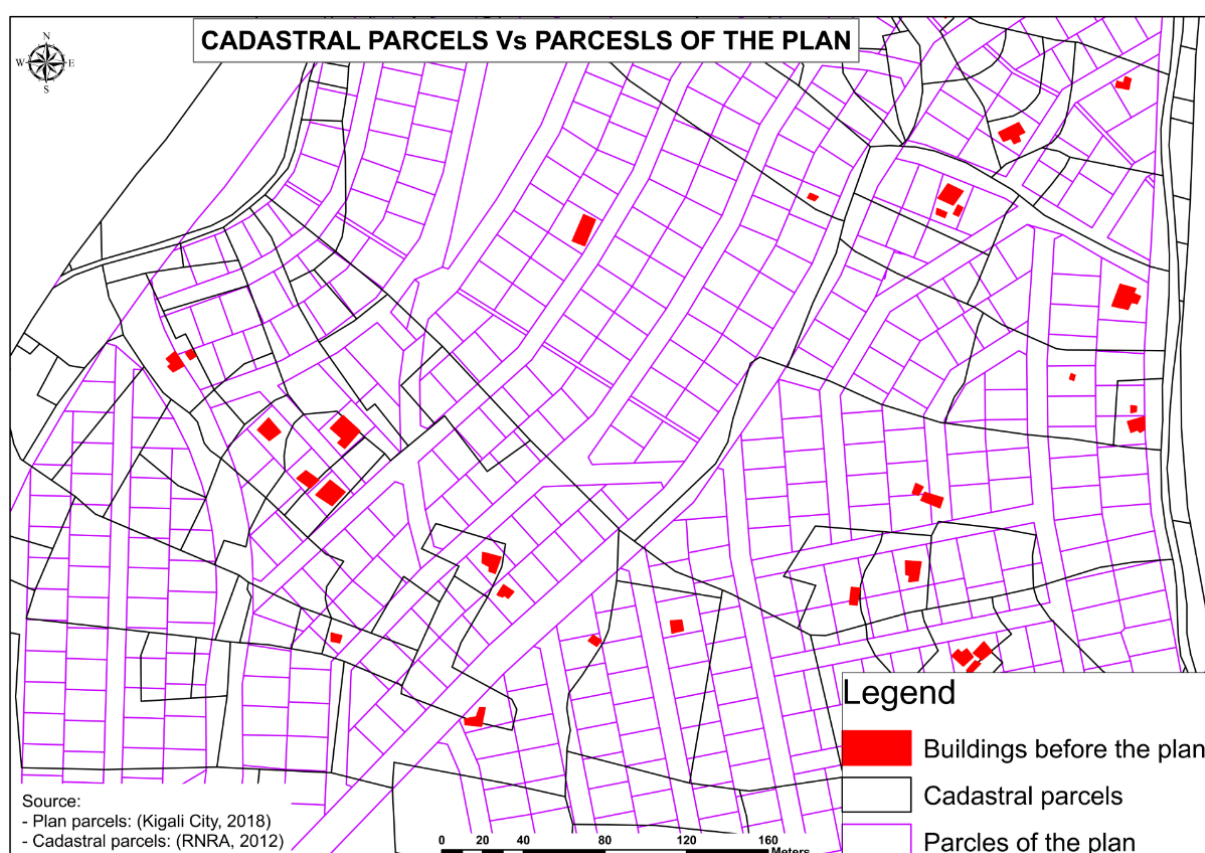
landuse of the plan. Grassland therefor indicated many unoccupied plots waiting for construction, and grasses are grown in those plots. This agrees with the argument by Nilsson, Pauleit, Bell, Aalbers, and Sick Nielsen (2013) [19] that landuse change in peri-urban area increases the pressure on the environment by destructing and fragmenting the natural habitat as wells as loss of agriculture land.

Percentage of landuse changes is also summarized in the Table 1.

Regarding the parcel structure, it was found that all parcels have changed the boundary, some plots were merged with others to form a parcel with the required size, and others were subdivided into many plots. Changes in parcel structure also affected some houses in the site. Houses located across the boundaries of new parcels and those houses are under the risk of demolition when implementing the plan. The increase in accessibility to utilities in the site required individual land taken for those utilities. Many plots were affected by utility provision as shown on the map below.

**Table 2** Landuse changes during the implementation of the plan.

Landuse	Area covered (hectare)		
	Before the plan	Plan	After the plan at the time of writing
Agriculture	43.8	0	0
Residential plots/buildings	1.8 (total area of buildings)	40 (total area of plots)	12.2 (total area of buildings)
Tree plantation/grassland	21	1.3	32.6
Bare land	2.6	0	0
Road	1.7	26.2	26.1
Recreational	0	0.3	0
Social infrastructure	0	3.1	0
Total	70.9	70.9	70.9



**Fig. 3** Cadastral Parcels and parcels proposed in the plan.

Such drastic change in landuse in Nunga and the increase in parcel numbers are also associated with land rights changes, also because people who used to live on agricultural can no longer engage with this livelihood activity. Changes in land rights are presented in terms of types of land rights. Land rights types were classified into use rights, the rights to rent the land, the rights to claim for compensation, the

rights to inherit the land, the rights to sell the land, the rights to subdivide the land and the right to use the land as collateral. Individual responses whether they have the respective type of rights before the plan and after the plan was considered to see changes in land rights. It was found that many changes in land rights occurred in the subdivision rights where no one has the right to subdivide the land anymore. The use rights have also

changed where only 14% of respondents said that they can use the land how they want compared to 78% reported as having this right before plan implementation. 65% of respondents said that they have the right to pass on the land as inheritance presently, while the remaining 35% stated that they can no longer do this, because it is no longer possible to subdivide the land. The latter think that they do not have the right to pass on land as inheritance anymore in a de facto way because practicing the right would require the right to subdivide. Some people do not have land titles yet; consequently, they responded that they could not sell and transfer their land, nor use it as collateral. It was noticed that some respondents doubted about compensation rights, they were not sure if they have this right or not. The compensation was not involved for land taken by utility provision, and landowners did not share the cost or land for public infrastructures. In fact, roads took portions of land from some landowners; for those whose lands were not taken by infrastructures, they were safe to keep the entire land. Owners whose lands were taken by infrastructures did not get compensation as it was agreed between landowners and government officials before the plan.

After the exploring the process of land readjustment in Kigali City, and their associated impact of land readjustment, I found it important to compare it with the process proposed by the UN-Habitat to see similarities and differences, but also to draw some recommendations for the country and the future research.

### *3.4 Land Readjustment in Nunga Can Be a Process Near to UN Habitat Standard of Land Readjustment?*

Land readjustment process is undertaken differently depending on the country context with the initiative or the implementation being taken by the government, developers or landowners [20]. In Nunga, the government took the lead in plan preparation, but

during the implementation of the plan, the representatives of landowners took the lead.

According to UN-Habitat (2018) [6], land readjustment starts with choosing the location where existing land uses are inconsistent with optimal development, then get consent from landowners to consolidate land as a unit for planning. In Nunga site, the district hired the company to prepare the plan and consulted landowners at the implementation stage.

Land readjustment should result in a situation where everyone benefits. Landowners benefit from increased land values and the government gets a well-planned settlement without the compulsory land acquisition of land. Each landowner should receive a plot of land that is smaller but worth more than the original plot [8]. In Nunga site, not everyone benefited from land readjustment, or the benefits were not equally distributed. Land was reduced for some landowners but not all; land not affected by infrastructure provision was kept entirely by owners. However, the government got a planned settlement.

Land readjustment process should be self-financed as far as possible; this is possible only if the value of the land increases so that the district can sell portions of shared land to cover costs. The land reserved is sold at the end of the project to pay for planning, administration and construction costs [8]. Nunga redevelopment process was self-financed. The source of money to cover the costs for the project was called “development fees” paid by buyers of plots in the site. The old landowners did not pay the money or contribute land to cover the planning, administration and infrastructure fees. This disagrees with the course of action suggested by UN-Habitat (2016) [8] that the costs and benefits should be distributed fairly and equitably in land readjustment. It is difficult to say that the cost was shared in Nunga settlement plan implementation because only new landowners paid the development fees. I find this as unequal treatment of citizens; why payment of development fees by new landowners, not old landowners? However, old

landowners who decided to keep more than one plot paid the development fees for the other plots. This is the district strategy to discourage people from keeping more plots because the district wanted to accommodate many people on small land due to the high demand for housing in Kigali. But this might interfere with land right in case it is considered as forced selling. Again, it was found from the interview that the buyers were given a maximum of two years to develop the site according to the plan. Those are measures of enforcing the implementation of the plan which might also interfere with land rights in case the land is not developed within that period.

Stakeholders’ participation is important in land readjustment. According to UN-Habitat (2016) [8], during the conceptualisation of land readjustment project, authorities should explain the project to residents, landowners and occupiers. The public should be informed about the current and estimated future values of the plots after the readjustment in order to get the stakeholders commitment. However, public participation is often limited to commenting on the prepared spatial plans which often causes critics or rejections by the public [21]. This is exactly what

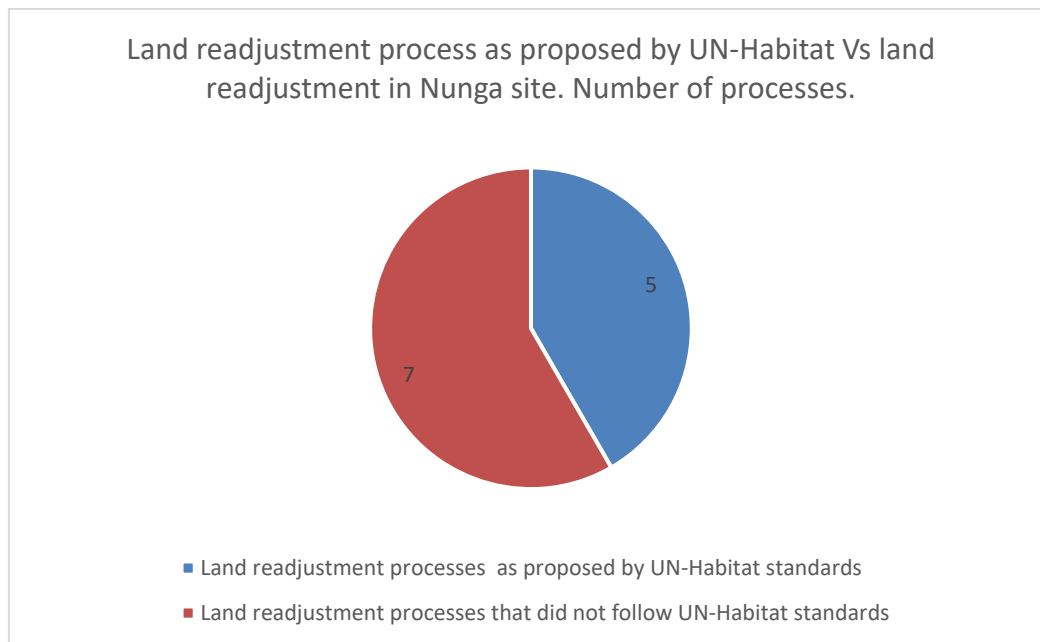
happened in Nunga site; the district prepared the plan and came to explain to local people in a meeting. However, community participation is not homogenous; during the implementation of the plan, most participation took place through members of the committee. This is the second to the highest level of participation on the ladder by Arnstein (1969) [14]. It was noted that the committee did a lot of “voluntary” work during the implementation of the plan. I can interpret this kind of participation, on one hand, as participation in response to a lack of resources (money); this is also proved by the argument from the planner that he would have preferred to expropriate people, develop infrastructures and then place people back, but no money was available for expropriation.

At the end of land readjustment process, landowners are entitled to the formal land title or other document specifying their rights [8]. In Nunga site, after land reallocation, landowners were supposed to re-register their land. The process of registering the land was long and rather complicated in Nunga site.

To summarise land readjustment process in Nunga site with reference to the course of action suggested by UN-Habitat, a comparison table is provided below.

**Table 2 Land readjustment in Nunga Vs course of action by UN-Habitat.**

No	Land readjustment (LR) suggested course of action by UN-Habitat	Land Readjustment (LR) course of action in Nunga redevelopment project
1	Ask the consent from landowners	The consent was asked at the implementation stage
2	No compulsory land acquisition in LR	All landowners committed to the plan by giving the land title for land consolidation
3	Consolidate land to form a unit of planning	Land was consolidated and planned as a single unit
4	Sharing land to cover LR process	Land was not shared; the costs of the project was covered by fees paid by buyers of the plot in the site
5	Self-financed LR process	Nunga redevelopment process was self-financed by the so-called “development fees”.
6	Cost sharing between landowners in LR	Cost was not shared since only new landowners paid for the project costs
7	Benefit all landowners in LR	Some landowners did not benefit because infrastructures took most of their lands and no compensation was involved
8	Everyone gets smaller land than before	Not everyone got the smaller land. Only owners whose land were affected by infrastructure provision
9	Land value increase	The value of the land increased in Nunga site in general
10	Manage compensation	No compensation as agreed before the implementation of the plan
11	Preserve land titles after LR	Land re-registration was done to have new land titles
12	Residents stay in the neighbourhood	Some residents relocated from Nunga site



**Fig. 4** Land readjustment as per UN-Habitat Vs Land readjustment in Nunga site.

Among the twelve processes of land readjustment, the five processes followed the process proposed by the UN-Habitat while seven processes did not.

#### 4. Conclusion

Peri-urbanisation is going on in Kigali and has brought changes in land use and rights. The city of Kigali and Kicukiro District have prepared Nunga settlement plan to regulate the land use change in that area. The implementation of Nunga settlement plan required land readjustment which affected land rights in land acquisition and reallocation process; most changes occur in subdivision and use rights; and for some other rights like compensation and inheritance, a lack of self-determination of some respondents whether they have those rights or not were noticed. In addition the plan came to settle people in a planned manner but some people left the site during the implementation of the plan due to, on one hand, the inability of people to comply with the requirements of the plan (housing requirements), and on the other hand, the change of livelihood activity due to land use change from agriculture to residential.

The approach used to redevelop Nunga site was proposed by the district who wanted to settle people in a planned manner. The site was selected and given to the private company to prepare the plan and construct roads. Then, landowners were informed and elect the committee to represent them during the whole process of land acquisition and reallocation. Land titles were collected and the land agency created the cadastre reflecting the plan. The land readjustment in Nunga turn out to be a self-financing process because buyers of the land paid fees for development, and the fees were used to pay the company who prepared the plan and construct roads.

The availability of cadastre in Rwanda makes land readjustment possible technically, the political set up of the country was also an important factor in making land readjustment possible; I mentioned, the trust that the government has built to its citizen, the enforcement of developmental policies and the mindset of legacy and sovereignty that the government has empowered.

However, the approach used in land readjustment shows quite deviation to the standards of land readjustment by UN-Habitat. Landowners did not contribute portions of land to cover the costs of the

project; land reduction for public infrastructures was not systematic to all landowners in the site; the land reallocation was not based on the size or value of the land each landowner contributed to land consolidation; and the compensation was not involved for land taken for road development.

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