Web Based Lands and Housing Information Tracking System

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Abstract: *The concept of land can be viewed in several ways, based on its context, and the situation for which it is being considered. The use and valuation of land is one of the important questions in economic theory. Land is an essential factor of agricultural production, and agriculture is seen as the most important economic activity in agrarian societies. This research work aimed at developing a web-based databank system for storing and retrieving vital information concerning lands. The system keeps record of all lands including the land size, land location, land owners and land use information in a central database in such a way that people seeking information on any landed property can remotely log into the system and retrieve the required information. With this information system, land buyers can be properly guided on the type of structure to erect on each land hence promoting proper town planning. The programming languages used for developing this system are HTML, CSS, Bootstrap and PHP, while the methodology adopted is Structured System Analysis and Design Methodology. The system will be very useful for ministries of land and other organizations that deal on lands.*

Keywords: *Lands, Property, Housing, Tracking, Web, Land Information System,*

1. Introduction

Land is referred to real estate or property, without structures and equipment that has a specified designation following stable spatial boundaries. Land is basically a distinct piece of earth or a property with an outlined boundary, which has an owner [1]. Land, on its own is very valuable, but it becomes more valuable when accompanied with natural resources such as crude oil, gas, coals, rocks. In standard law systems, land tenure is the legal law whereby a land is owned by an individual, that holds the land. This law determines who uses the land, duration of usage and the condition involved. Tenure is usually based on stipulated laws and policies, as well as on non-formal practice. In the 1960s, economists and legal scholars ventured into study of property rights which was found to be beneficial to tenants in various estates [2]. This improved understanding of the property rights enjoyed

by tenants under the various estates to a greater extent. With economic development, the use of land has increased tremendously. Such uses include for factory sites, schools, offices, etc. Consequently, there is need for adequate record keeping of land information by Ministries of Land, such that land owners, land uses, location etc. are well documented to curb incessant land disputes originating from irregular land sales and also ensure that lands are put into appropriate use for increase productivity. Hence we proposed an integrated web-based information system which comprises of not only accurate, but current and reliable land records, as well as other vital data associated with the land such that one can easily access the system and retrieve required land information.

2. The Concept of Land Property

Property is any physical or intangible entity that is owned by a person or jointly by a group of persons[3]. Depending on the nature of the property, an owner of property has the right to consume, sell, rent, mortgage, transfer, exchange or destroy their property, and/or to exclude others from doing these things. Important widely recognized types of property include real property (land), personal property (physical possessions belonging to a person), private property (property owned by legal persons or business entities), public property (state owned or publicly owned and available possessions) and intellectual property (exclusive rights over artistic creations, inventions, etc.), although the latter is not always as widely recognized or enforced [4].

Property is a system of rights that gives people legal control of valuable things and also refers to the valuable things themselves. Depending on the nature of the property, an owner of property may have the right to consume, alter, share, redefine, rent, mortgage, pawn, sell, exchange, transfer, give away or destroy it, or to exclude others from doing these things as well as to perhaps abandon it; whereas regardless of the nature of the property, the owner thereof has the right to properly use it (as a durable, mean or factor, or whatever), or at the very least exclusively keep it.

Property is usually thought of as being defined and protected by the local sovereignty. Ownership, however, does not necessarily equate with sovereignty. If ownership gave supreme authority, it would be sovereignty, not ownership. These are two different concepts. Public property is any property that is controlled by a state or by a whole community [2]. Private property is any property that is not public property. The expectation of profit from improving one's stock of capital" rests on private property rights. It is an assumption central to capitalism that property rights encourage their holders to develop the property, generate wealth, and efficiently allocate resources based on the operation of markets. From this has evolved the modern conception of property as a right enforced by positive law, in the expectation that this will produce more wealth and better standards of living [5]

Property is considered natural but not inevitable. Political power is a consequence, not the cause, of the distribution of property. The worst possible situation is one in which the commoners have half a nation's property, with crown and nobility holding the other half—a circumstance fraught with instability and violence. A much better situation (a stable republic) will exist once the commoners own most property, he suggested [6]. Pierre-Joseph Proudhon In his 1840 treatise What is Property? Pierre Proudhon answers with "Property is theft!" In natural resources, he sees two types of property, de jure property (legal title) and de facto property (physical possession), and argues that the former is illegitimate. Proudhon's conclusion is that "property, to be just and possible, must necessarily have equality for its condition. His analysis of the product of labor upon natural resources as property (usufruct) is more nuanced. He asserts that land itself cannot be property, yet it should be held by individual possessors as stewards of mankind with the product of labor being the property of the producer. Proudhon reasoned that any wealth gained without labor was stolen from those who labored to create that wealth. Even a voluntary contract to surrender the product of labor to an employer was theft, according to Proudhon, since the controller of natural resources had no moral right to charge others for the use of that which he did not labor to create and therefore did not own [7].

There has been much confusion in property rights inquiry into real (immovable) property (i.e., land) between open access and common property, and between public property and common property because that is often also open access. The property rights and access control are two distinct dimensions of land resource management. Access control involves the exercise of exclusionary power relevant to the management of the immovable property (property management) for its optimal use [8].

Figure 1: Land (Source: Lai, L. W., Davies, S. N., Choy, L. H., & Chau, K. W. ,2022).

2.2. Land Information Systems

Land Information Systems provide a foundation for a broad range of thematic environmental applications, within a given geographical context (localized, national or regional in scope). The core data typically describe the inherent, immediate properties and characteristics of the land, which can be combined with other resources, such as satellite imagery, cadastral information and climate observations and projections. LIS draw upon a range of modelling and geoprocessing technical capabilities to combine these resources to assess land suitability, such as for agriculture [9]. A temporal context can be introduced by including indicators of environmental change associated with a static survey and inventory, or with ongoing monitoring, such as soil degradation threats Likewise, modelling applications can explore the likely consequence of fate and behaviour of compounds in the soil, or the consequence for soil functions of changing climate patterns or land use. The outcomes from LIS permit key actors to make both informed decisions and effective plans, as well as support environmental education and awareness [10].

2.3. Review of Related Works

Exploring whether blockchain technology can be used to solve the problems in the land trade ecosystem[11] looked at the possible blockchain based solutions that are being envisioned in various parts of the world. An architecture of the envisioned system and implementation which was done in phases with incremental development after each phase. The artifact was then subjected to an expert evaluation to determine the feasibility and efficiency of the artifact as per the real world scenarios. It was found that blockchain technology can be used as an effective framework for storing ownership data and dealing with land sale process[11]. A systematic analysis of local-scale land-use change studies, conducted over a range

of timescales helps to uncover general principles that provide an explanation and prediction of new land-use changes. They stress that, Land-use change is driven by synergetic factor combinations of resource scarcity leading to an increase in the pressure of production on resources, changing opportunities created by markets, outside policy intervention, loss of adaptive capacity, and changes in social organization and attitudes[12**]**. Residential land use succession theory is permeated by the "life cycle" ideas of social ecology, but the leading succession models offer conflicting interpretations of the sequences of change that residential areas are believed to pass through. They stress that models have not been substantiated by analyses of the complete land use histories of all sites in areas of change. Therefore, in their study of Edmonton, from 1961 to 1971, the study shows that life-cycle concept has little value as an explanation of residential change in a young, rapidly-growing city[13].

Both empirically and theoretically, socio-cultural anthropologists have much to contribute to interdisciplinary debates concerning property. The longest section presents results from recent investigations of decollectivization in the rural sectors of former socialist states. The generally disappointing outcomes of privatization can always be explained away in terms of 'institutional' shortcomings, but the real challenge is to devise more flexible property rules to deal with diverse goods and local environments. 'Propertization' is continuously establishing new 'fictitious commodities', but it is argued here that some critics of neoliberalism exaggerate the nightmare of its property logic and overlook the countertendencies. In this respect the emerging debates over property recall earlier discussions over the emergence two centuries ago of an allegedly 'disembedded' market economy[14]. In Texas, there are some 1500 so-called *colonias* housing an estimated 400,000 people mostly in peri-urban areas of the border region with Mexico. At the outset colonias are unserviced or poorly serviced low-income housing settlements in which lots have been sold by developers upon which residents place trailers, construct manufactured homes, or engage in self-build. Recent research is beginning to identify similar types of semi-formal homestead sub-divisions elsewhere in the United States, suggesting that this is a widespread and growing phenomenon. However, while many such sub-divisions are sold out, the proportion of lots actually occupied varies greatly, with anywhere between 15 and 80 percent of lots being left vacant. This creates multiplex problems for effective provision and cost recovery of physical and social infrastructure, as well as for effective formation of social capital necessary for active community participation and mutual aid in local development projects. Sometimes, the land allocation process also has led to confused occupancy and to conflict about rightful lot ownership. Although recent research has led to a better understanding about the nature of these sub-divisions, it is often difficult to trace the ownership of individual lots. This is especially the case with absentee owners [15].

The impact upon land prices of a major title 'regularisation' initiative to clear property titles of very poor households undertaken by the Community Resources Group (CRG) Receivership Program at the behest of the Texas State government between 1995 and 2002. Land price data and trends are analysed using a major CRG database of over 1400 price records and files, complemented by a questionnaire survey of over 260 households applied by the research team as part of an evaluation of the CRG Program. The data show that prices are relatively 'flat' in real terms over time and that, while there was a spike in prices during the early 1990s, there does not appear to have been any significant increase since regularisation. The data suggest that prices appear to be shaped more by socially determined criteria associated with the developers themselves, rather than by settlement characteristics, location, etc. Regularisation of land title appears to make little difference to land market performance and, while *colonias* are a vehicle for investment for low-income groups, the rate of return compared with other segments of the (formal) property market is very low [16].

3. System Analysis

3.1. Analysis of the Existing System In Ministry of land and housing Enugu state, land information is documented manually. Files are created for different plots of land. These filesare kept in a file cabinet. In the file, all the details of the property owner, land size and location is documented. Any form of transfer or sales is equally recorded on the file manually.

3.2. Analysis of The Proposed System. The proposed system presents a web-based land information system for the management of land information in Enugu state.. The system provides a dashboard for an interface for land searching using cardinal points, land owner or land address. The input design of the proposed system is made up of the land registration form, login form and a textbox. The Land registration form is made up of land size, Owner Full name, latitude, longitude, land address, Land Use, and the land registration date. The login form contains the staff email address and password. The login form also

contains the email and password of the administrator. The textbox contains a form on which land searches can be performed on. The output design are the messages displayed to the staff, when the successful register, login and searches for land is performed. The output design also shows shows the images shown when the map of a given land location is zoomed. In the proposed system staff can carry out the following functions like updating a particular land/property, view land ownership history, delete a land record from the system. The administrator can add and delete staff from the system and also create and delete land information.
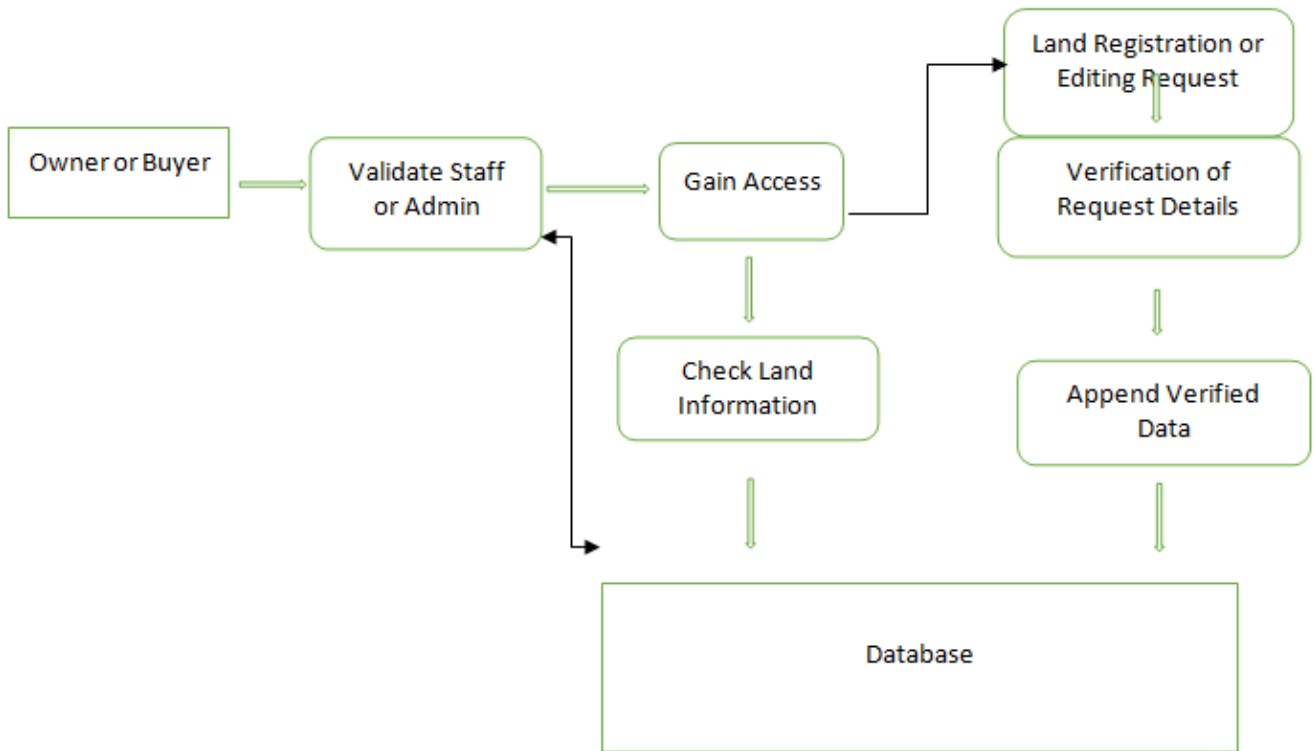

Figure 2. Dataflow Diagram of The Proposed System

4. Land and Housing Databank

Developing a land information system that keeps records of lands and enable retrieval of such information when needed is vital. This is to enhance a workable form through which all the inputs will be made to the system through a well formatted output of land information to enable easy search on the land database. The resultant effect which is efficiency and accuracy.
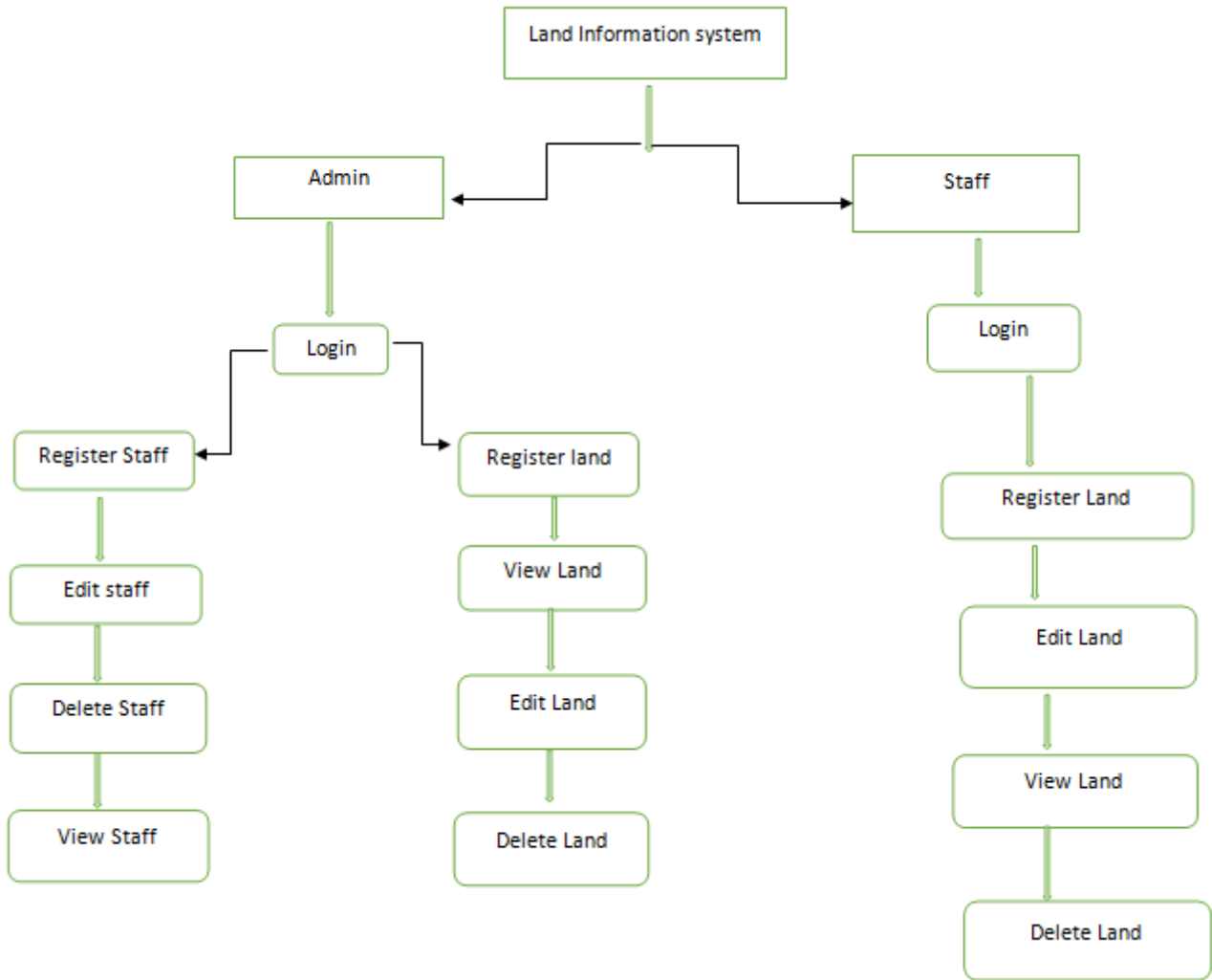
Figure 3. High Level Model of the System
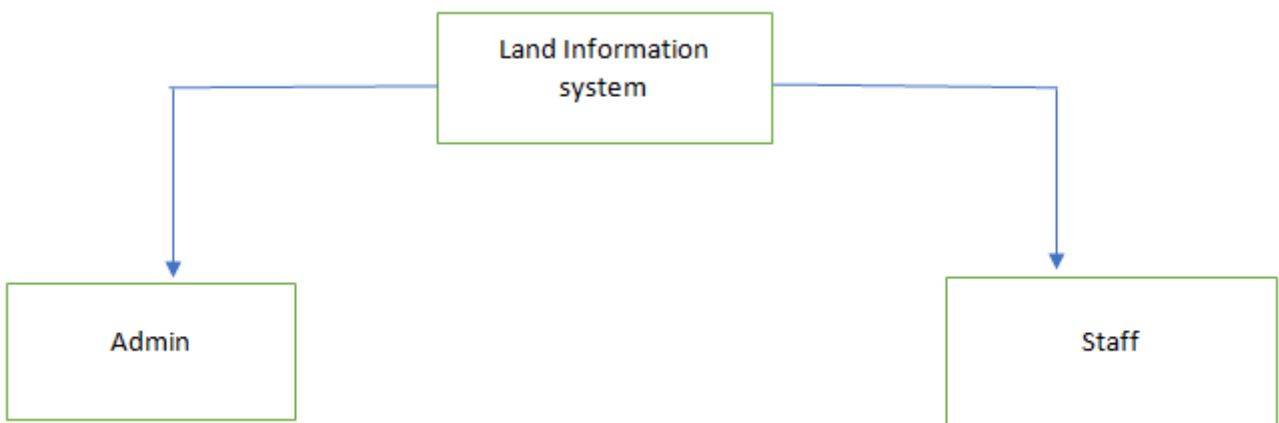
Figure 4. Control Centre/Main Menu

The main menu consist of two modules which are that of the Admin and staff. In the admin module, the admin can enter new land records, delete existing records, view records, register new staff, view all staff and delete staff record from the system when necessary.

The admin dashboard is the landing page after admin logs in. From here the admin can enter new land or staff registration, edit and delete staff and land records and also view exiting records when necessary.

Staff: in the staff module, the staff can create new land record, view and delete land records and edit land records when necessary. The staff dashboard is the landing page after a staff logs in. From here the staff can enter new land records, edit land records and also view exiting records from here.

4.1 Database Design

	Table ▲	Action						Rows	Type	Collation	Size	Overhead
☐	admin	★	Browse	Structure	Search	Insert	Empty	Drop	1	InnoDB	latin1_swedish_ci	16.0 KiB	-
☐	history	★	Browse	Structure	Search	Insert	Empty	Drop	0	InnoDB	utf8mb4_general_ci	16.0 KiB	-
☐	lands	★	Browse	Structure	Search	Insert	Empty	Drop	0	InnoDB	utf8mb4_general_ci	16.0 KiB	-
☐	staff	★	Browse	Structure	Search	Insert	Empty	Drop	0	InnoDB	utf8mb4_general_ci	16.0 KiB	-
	4 tables	Sum						1	InnoDB	utf8mb4_general_ci	64.0 KiB	0 B

	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
☐	1	id 🔑	int(20)			No	None			Change Drop More
☐	2	email	varchar(100)	latin1_swedish_ci		Yes	NULL			Change Drop More
☐	3	password	varchar(100)	latin1_swedish_ci		Yes	NULL			Change Drop More
☐	4	username	varchar(20)	latin1_swedish_ci		Yes	NULL			Change Drop More

Table1. Admin Table

	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
☐	1	id 🔑	int(11)			No	None			Change Drop More
☐	2	land_id	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More
☐	3	address	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More
☐	4	latitude	varchar(100)	utf8mb4_general_ci		No	None			Change Drop More
☐	5	longitude	varchar(100)	utf8mb4_general_ci		No	None			Change Drop More
☐	6	Owner	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More
☐	7	land_use	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More
☐	8	size	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More
☐	9	date	varchar(100)	utf8mb4_general_ci		No	None			Change Drop More
☐	10	contact	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More
☐	11	plot_number	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More
☐	12	lga	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More
☐	13	occupation	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More
☐	14	nationality	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More
☐	15	occupancy_number	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More

Table 2. Land Records Table

	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
☐	1	id 🔑	int(11)			No	None			Change Drop More
☐	2	name	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More
☐	3	date	varchar(100)	utf8mb4_general_ci		No	None			Change Drop More
☐	4	staff_id	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More
☐	5	email	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More
☐	6	username	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More
☐	7	password	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More

Table 3. Staff Table

	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action		
☐	1	id 🔑	int(11)			No	*None*			🖊 Change	⊖ Drop	▽ More
☐	2	history_id	varchar(200)	utf8mb4_general_ci		No	*None*			🖊 Change	⊖ Drop	▽ More
☐	3	seller	varchar(200)	utf8mb4_general_ci		No	*None*			🖊 Change	⊖ Drop	▽ More
☐	4	buyer	varchar(200)	utf8mb4_general_ci		No	*None*			🖊 Change	⊖ Drop	▽ More
☐	5	date	varchar(100)	utf8mb4_general_ci		No	*None*			🖊 Change	⊖ Drop	▽ More
☐	6	reason	varchar(200)	utf8mb4_general_ci		No	*None*			🖊 Change	⊖ Drop	▽ More

Table 4. Land Sales History Table
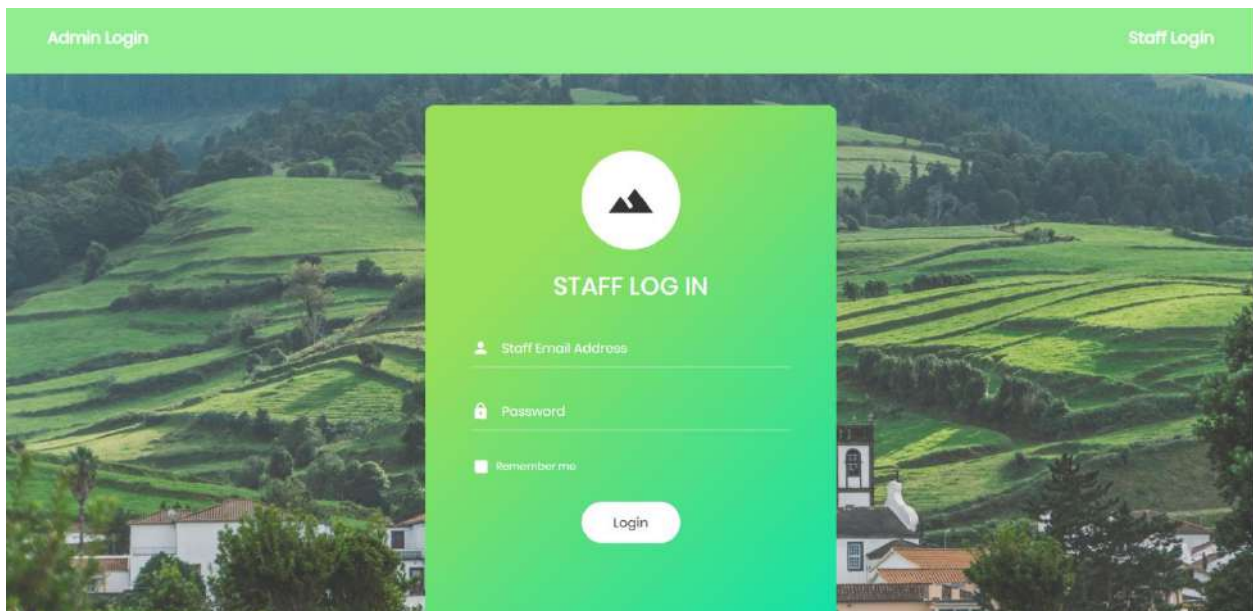
4.2 Input/Output Specification
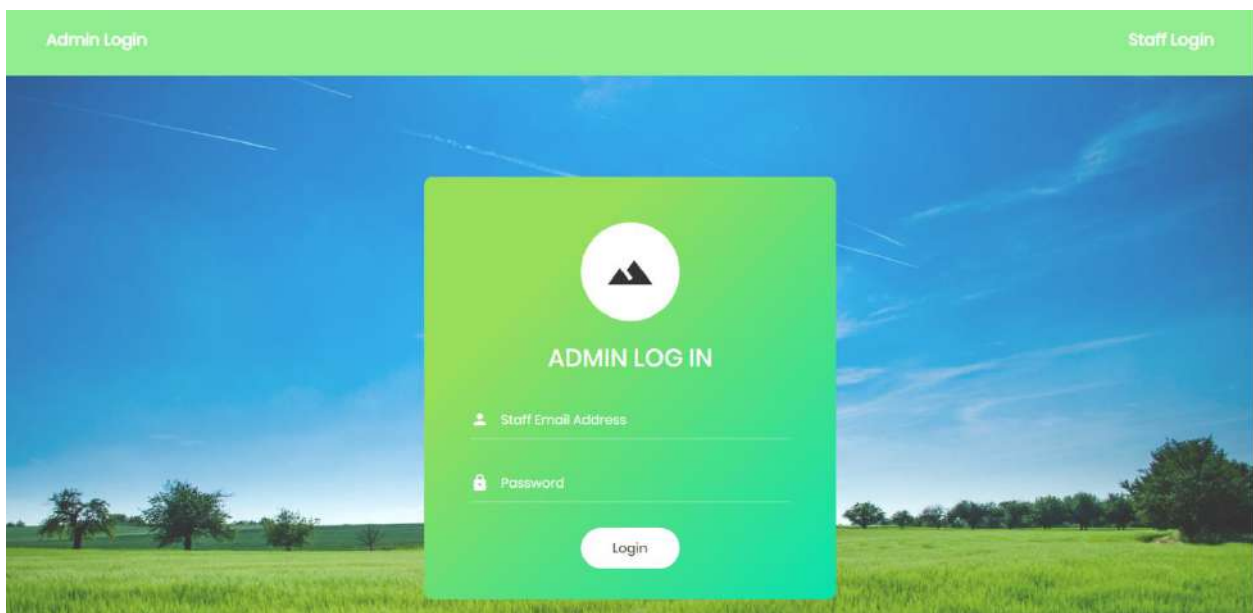

Figure 5. Staff Login Form

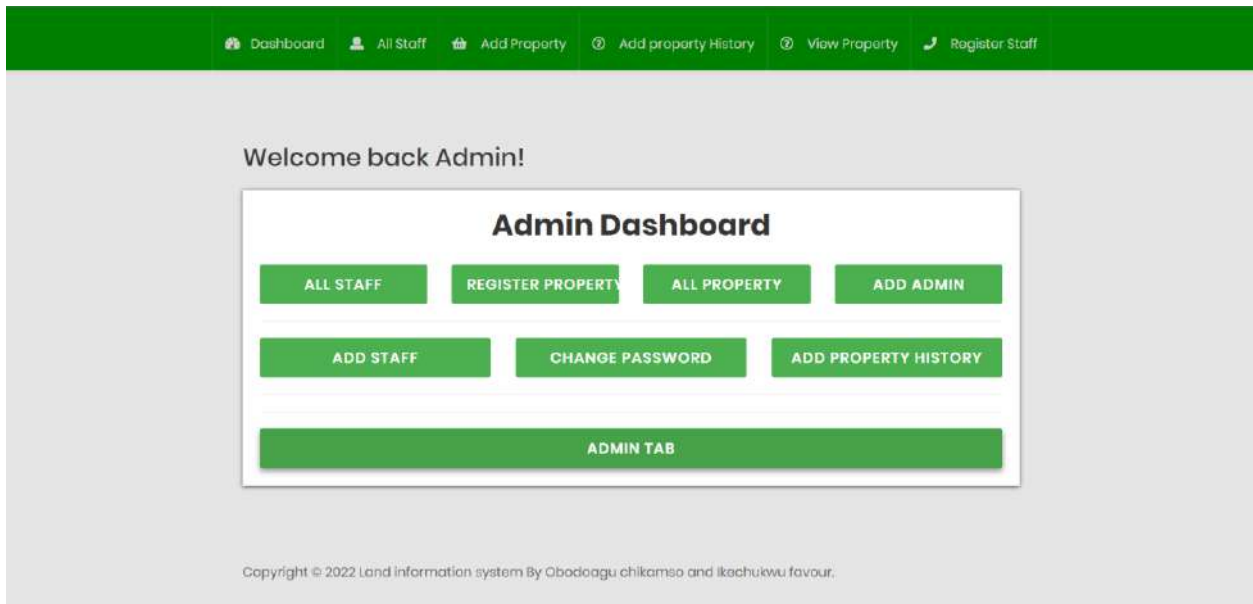**Figure 5.** Admin Login form
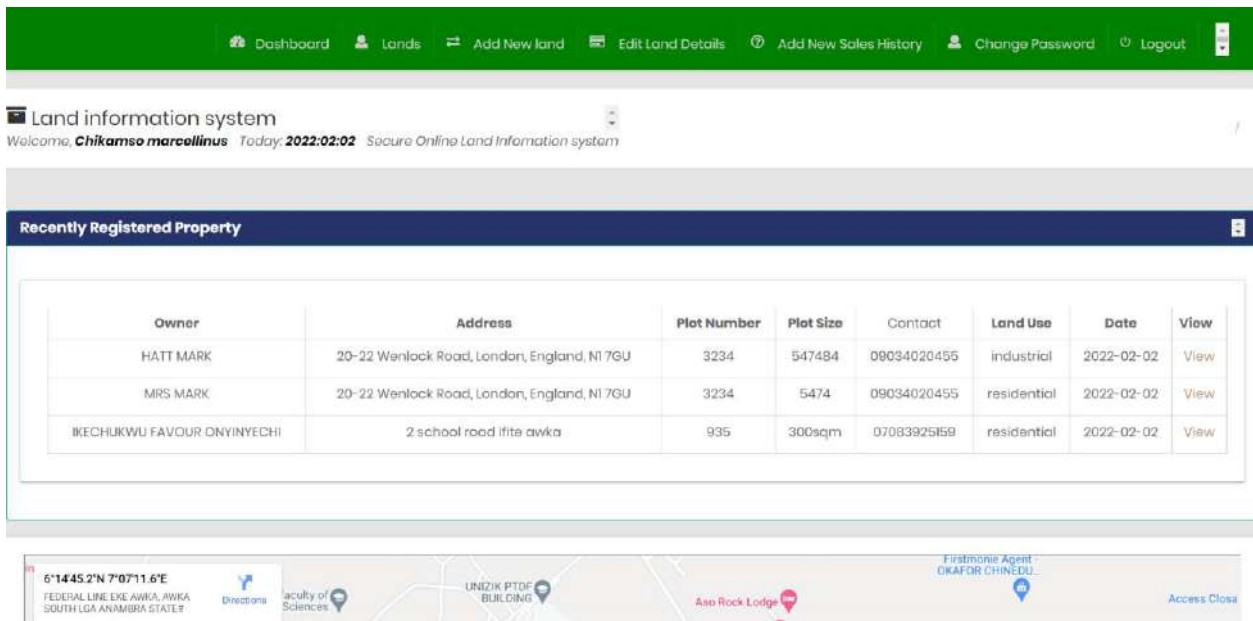
Figure 6. Admin Output Specification

Figure 7. Staff Dashboard Output Specification

5. Conclusion

Real property and personal property are the main classifications of property in the common law. Real property refers to land and the improvements made by human efforts—buildings, machinery, the acquisition of various property rights, and the like. Real property is also termed realty, real estate, and immovable property. In countries with personal ownership of real property, civil law protects the status in realty markets, where realtors work in realty selling real estate. Scottish civil law calls it heritable property, and in France it is said to be immobiliser. To be of any value a claim to any property must be accompanied by a verifiable and legal property description. Such a description could make use of natural boundaries such as river and roads, or make use of purpose made markers such as cairns, posts, survey marks, etc.

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