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Faculty 1 – Architecture, Civil Engineering and Geomatics

Master Course Urban Agglomerations (Winter Term 2021)

“Land and Property Valuation”

Script

„Valuation is an art and not a science, but it is not astrology. I think the valuers were star struck by what they saw and did not have their feet on the ground.”

(Foreword of:
“Modern Methods of Valuation” by Tony Johnson, Keith Davies, and Eric Shapiro, 9th edition, 2000)

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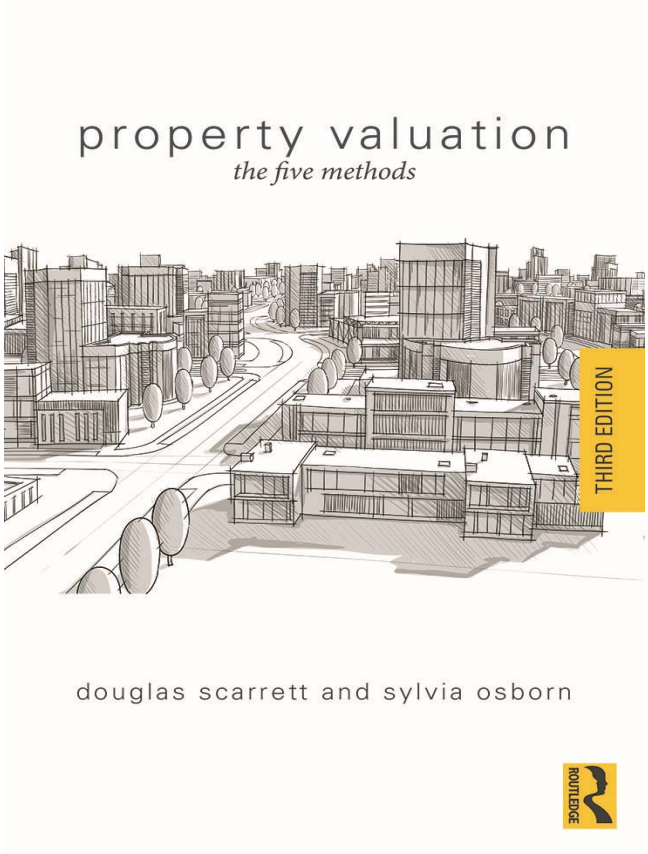

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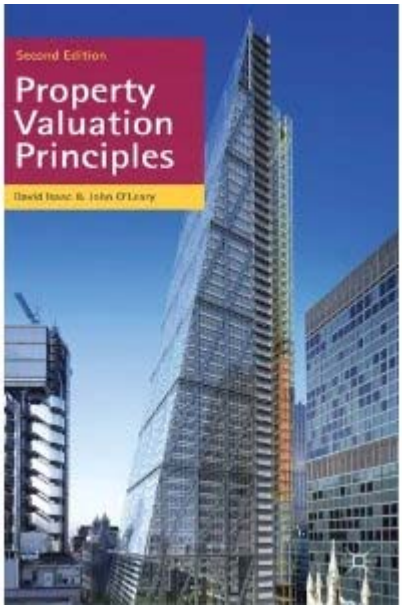

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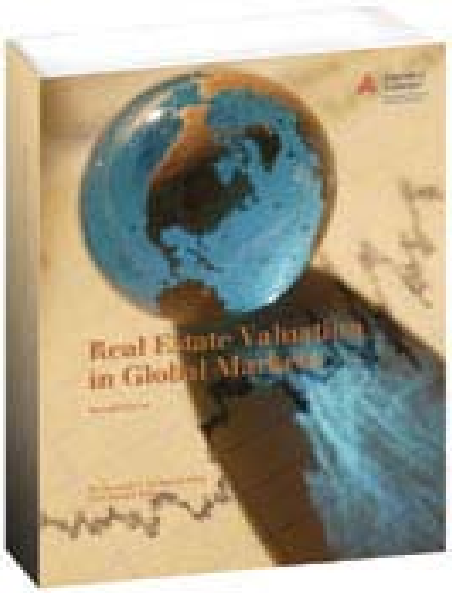

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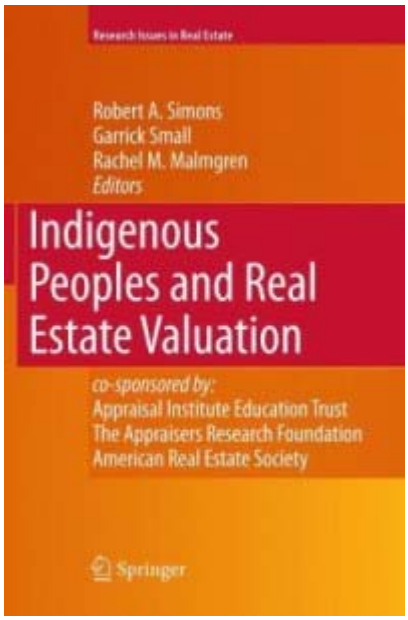

Prof. Dr. Fabian Thiel

"Market Value": Definition

"(...) the estimated amount for which property should exchange on the date of valuation between a willing buyer and a willing seller in an arm's-length transaction after proper marketing wherein the parties each had acted knowledgeably, prudently, and without compulsion".

1. Introduction

Land is defined as the earth's surface and anything that is attached to it. Land provides the foundation for the social and economic activities of people (see **Table 1**). It is both a tangible physical commodity and a source of wealth. Since land is essential to life and society it is important for many disciplines including law, economics, sociology and geography. In economics, the four agents of production including: vacant land (e.g., land with nothing attached to it) labor (that includes materials used in construction), capital and entrepreneurial coordination (profit) are combined to create real estate, and the sum of their costs is a base for land value.

Attributes of land include: unique location and composition, physically immobile, durable, finite supply and useful to people. These attributes form the foundation of land's value. Appraisers measure value as of a specific date. For the cost method in particular, land comprises two distinct components. One component is the site that is the earth's surface portion of the land (technically a site is vacant land that is ready to be used for a specific purpose). The other component is what is attached to the site and is referred to as building. However, the land value does not exist. Controversies between classical and neoclassical economists about the economic land value or about the exchange value mirror the difficulties in explaining the creation of the land value or the ground rent. A distinction must be made between at least three categories of land value for State and private properties as well.

Land value category	Legal Plurality and content of land use
Territorial land value	Content, duration, and intensity of the land use rights (land tenure; legal plurality)
Economic land value	Gain from the real estate use
Ecologic land value	Ecological quality ("ecological fitness")

Table 1: Plurality and meaning of land value categories

A sustainable **valuation** and **land taxation** system is crucial for a successful and sustainable land use policy and land markets in developing countries. Valuation and taxation help to support a clear pro-poor land policy, particularly through social and economic urban and rural development and sustainable use of natural resources. In addition, valuation and taxation are indispensable parts of land reform. This includes access to fertile land for agriculture, reduced housing or land prices for social housing programs, investments in infrastructure,

and decreased urban sprawl. However, especially land taxation remains one of the most misunderstood concepts in public finance. But most legislators in developing countries have the chance to bring the ideas and advantages of a property taxation back in the political discussion, when it comes to a new round of tax and land reforms. In many countries, land valuation and taxation issues are embedded in land sector programs, aiming at sustainable national and sub-national income and property taxation for development and poverty reduction. Higher revenues from the land use, in combination with efficiently working public audit authorities, could result in increased independence of developing countries from financial aid ("donor money").

2. Background

Land consists of **property rights**. These rights are to be valued and taxed. The term "land" has to be interpreted as land including constructions or improvements (assets) and property rights which are appraisable for mortgages, to determine co-ownership value and for capital gain. Hence, land is the single greatest capital resource in most countries and thus subject to valuation and – as immovable property – to taxation. Property taxation could become an important future source of the national and sub-national revenue in developing countries to improve public finance and in order to gain independence from development aid (donor money). To achieve this goal, taxation should be flanked by a coded, transparent and upgradeable property record system, in addition to Data Bases (DB), actualized or revised land valuation manuals, and a holistic land information system (LIS) infrastructure based on international standards.

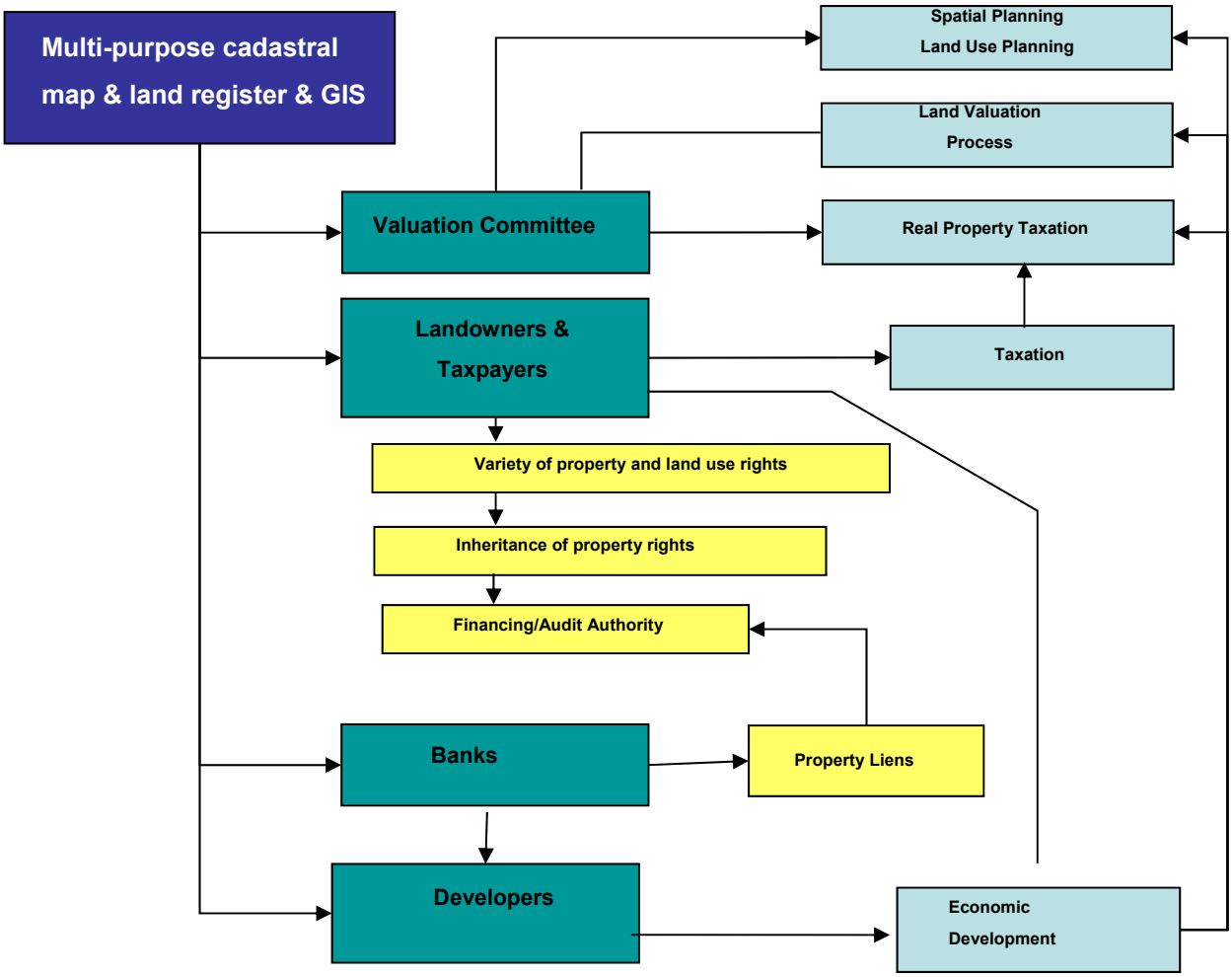

Figure 1: Land Information System (LIS) for modern and transparent valuation and taxation

Valuation and taxation should never be mixed up; they follow strictly different purposes. What they have in common, is the requirement of good governance in public finance for transparent land valuation and fair property taxation in developing countries. However, weak governance and corruption restrict development. They increase risks and reduce incentives for investment, saving and entrepreneurship. The distortion of incentives reduces productive capability. Weak governance reduces the finances available for public services such as health care and education. People may evade taxes by making “informal payments” to gain lower tax assessments. Therefore, an intelligent land valuation and taxation system is urgently needed in each country.

The **Land-Information-System** (LIS), comprising cadastral maps and land registry, serves as data storage and land valuation mapping to combine property and site related data, particularly size, location, and physical conditions of each plot (**see Figure 1** above). Land valuation is ideally being constructed as a sub-layer of the so-called “multipurpose cadastral system” for public and private land and fiscal purposes. Digitalized cadastres and land registers deliver personal and spatial information. When land is valued, the variety of exclusive property rights form the basis for each determination: Without state and private property which is in most countries of the world guaranteed by the Constitutions and sub-laws, no valuation and no land value would exist. Landowners and taxpayers are of paramount importance for the LIS, since they have to cooperate with the **public spatial planning** decisions and with the valuation and taxation authorities. The value of a piece of land (site) is generally calculated out of the net present value of the extra surplus – a surplus which normally can be achieved through **public land use and investment planning**.

An ideal spatial/land use planning policy would develop, organize, and protect the entire territory. Legal protection would be achieved with integrative, strategic territorial planning and the harmonization of regionally and locally significant instruments and measures like Commune Land Use Planning or Participatory Land Use Planning. Sufficient compliance of the land use planning objectives would be achieved. Regionally significant plans and measures would be harmonized and carried out in comprehensive development concepts while satisfying the requirements of the current land use planning policy. Rural and infrastructural development like village renewal can be very costly. It depends to some extent on the cooperation with the land owners who have to pay for the supply of infrastructure systems. Hence, the municipalities should be entitled to limited value capture. In addition, to ensure the development of local public transportation and communication infrastructure, of water and energy supply, of public health services, sanitation and water supply in the context of village renewal and rural development, land owners should be forced to take on some of these infrastructure costs.

Moreover, development in rural areas depends on the **poly-rationalities** and properties of the involved land owners. These poly-rationalities can be divided into the individualist’s bias (private property), the egalitarian’s bias (common property) and the hierarchist’s bias (rearranged land use rights). Therefore rural development needs a property steering component in order to integrate these rationalities of the land owners affected by rural development planning instruments and their modules. However, even the best plans are useless when they cannot be implemented. In some cases, plans are blocked by private land owners who do not accept the planning determinations for their plots and the restrictions of their private property. Instead, these private land owners hope to increase and bag the ground rent (“**rent seeking**”). A leasehold tenure system puts economic pressure to the private land owners so that the planning authorities are able to grant access to land without high transaction costs.

Spatial and land use planning are therefore instruments of national property and land use policy which serve land allocation, land distribution and land use intervention purposes. Land use plans should designate the permissible use of each plot of land through preparatory, or development plans and legally binding zoning plans. Increased local land use planning will

protect and promote sustainable urban development, social justice through land use, and an appropriate environment. This interlocking set of land use plans on a national, provincial, district and communal level is necessary to avoid urbanization, urban sprawl tendencies, underused land hoarding, the destruction of fertile farm land and – with growing importance – to gain comprehensive, systematic and transparent information for the assessment (screening and monitoring) of large scale **Foreign Direct Investments** (FDI) in agriculture, hydropower and mining. Therefore, land use plans should protect land that has been designated for a special purpose, such as the protection of a landscape for biodiversity/agricultural uses, or the prevention of an open space or fertile land from development (e. g. farmland conversion). In future, the "*machine of planning*" which combines tools to compare alternative actions and to identify best alternatives for the land use via planning should be determined by:

- The preferences of public and private land owners;
- The rule of law and territorial planning regulations that are legally binding;
- Public and private finance institutes, real estate banks and insurance companies;
- The land market, based on land and business valuation methods to identify land rental value and
- Land taxation.

3. Leasing Public Land: "*No man made the land*"

Private land use (land rights; land tenure) does not have to be linked with private property. Private property-oriented Western States have effectively created a situation in which private property rights have negative consequences for land use planning, land allocation, and land distribution because of the incremental economic value and rent of the land. Private property rights are to some degree obstacles for a sustainable land use planning policy and for a social land law. Many countries can achieve a land use system similar to the land leasehold tenure regulations in many modern States. In addition, they could be able to partly skim-off the economic ground rent through taxation like income tax, unused land tax and other tax forms that have to be constitutional before implementation. In other words: Land use planning by the State would become neutral when private property on land would be totally replaced by public land leasing. The combination of public land leasing, but private land use rights and partly skimmed-off ground rents bases on a land reformer's approach. Land reformers like Henry George, Adolf Damaschke, Franz Oppenheimer, Michael Flürscheim, but also economists like John Stuart Mill or Léon Walras and political philosophers like Immanuel Kant and Pierre Joseph Proudhon criticized private property for land and natural resources (commodities).

"***No man made the land***", is a famous quotation from John Stuart Mill (Mill 1848). The main arguments for such a skeptical interpretation of private property for immovable, public and non-renewable goods like land are:

- If all property rights are left in the hand of private people, any land use plan is useless. Economic interests dictate, and the arrangement is not effective. Negotiations will often fail.
- Because of high opportunity costs, only a certain part of the possible investment can be executed.
- Land distribution is unequal. The access to land is not guaranteed for a lot of people.
- The way of land use is determined by economic power. This fact is doubtlessly not a sound legitimating base for a sustainable land use management.

The property on land should belong to the municipality or commune. This strategy was the idea of Hans Bernoulli, a Swiss architect. Everybody should have the same chance to get access to land and its products via leasehold rights and auctions of the private land use

rights. But such an innovative land allocation and distribution system causes higher rents, land values and thus higher leasehold fees, if an adjustment to ground rents is made. A revolving (local) land fund can solve this problem by pooling of the paid ground rents and by redistribution of these ground rents in equal shares to the people.

A leasehold tenure can prevent against tenure insecurity for indigenous land owners and for communes. Doubtlessly, leasing rights cannot solve any specific marital problems that threaten land tenure security such as separation, divorce, abandonment, multiple marriage relationship, death of the husband, or unregistered co-ownership of the land. But leasehold tenure can reduce transaction costs for the access to agricultural land. Leasehold tenure regulations that already exist in many land laws throughout the world and are excellent land tenure alternatives to private property rights and absolutely equivalent to secure land tenure rights. The granted land use rights have to be paid by the users due to their economic capability. The lower the income per household, the lower the cost for the leaseholds and the transaction costs for this household. In a sound **Public Land Management** system land hoarding for speculative purpose and "rent seeking" would no longer exist.

Normally, vibrant land markets show a singular aspect: From an economic point of view, global land markets are governed by the principle of inelasticity of land supply. The supply of land cannot be increased due to a higher demand. The amount of land stays more or less the same. As a consequence, only the land prices and the land rent will rise in the case of an increased demand. The advantage that is given to the landowner is only given up by him if compensation is paid. Additionally, more and more agricultural land gets lost in favour of "exclusionary zoning" of large settlement areas and infrastructure units which can be shown as urban sprawl, suburbanisation tendencies, and the conversion of greenfields.

Moreover, leasehold tenure can avoid the lack of tenure security for indigenous land rights and for communes. It can help to register land systematically to women who primarily tend to achieve secure land use rights for their families to do subsistence farming or smallholder business. However, to ensure effective land ownership security for farmers and the equality in access to land for marginal groups like women, the young and the poor remain major challenges. This is valid for the land management in particular for developing countries. The current systematic land registration program in Cambodia (LAMDP) focuses on "creating" private ownership and tenure security through private property: "*While higher land values benefited village sellers, proceeds from land sales were not normally invested in productive pursuits*" (Analyzing Development Issues Team et al., 2007, p. 43).

Although a system of formalized rights based on the national cadastre system may enhance the transferability of land, this occurs at the expense of security of tenure due to superimposing the system of customary and genuine rights. On the global scale, it seems to be very questionable if transferability, tradability, and the unlimited access to private property (as part of the neo-institutional transaction cost theory) of land rights lead to sustainable use of non-renewable resources and could strengthen the land rights of the poor. Moreover, the importance of tradability is overweight; trade could be part of land markets, but the arrangements (e.g., leasehold contracts) between the State and the private land users are far more important. Leasehold tenure on State public land without speculation tendencies – and without the need of redistribution of private property – can give legal security to foster political and economic stability and can avoid the occurrence of land conflicts.

4. Land (Property) Valuation

In each developing country, emphasize is to be given to land valuation and taxation as indispensable parts of the future LIS. The guidelines for valuation and taxation are ideally embedded within national policies on land valuation that specifies and defines the land related guidelines (e.g., "*Land Policy Declarations*"). These should be identify its various applications and repartition of responsibilities among involved bodies, namely the ministries for spatial and fiscal information, and the additional councils dealing with valuation issues, e.g., Councils for Land Policy or Land Valuation Committees. A land valuation system in developing countries should always implement the "fair market value" according to the International Accounting and Valuation Standard (IAS) or the valuation standards of the Royal Institution of Chartered Surveyors (RICS).

BOX 1: Valuation Methods

The following three main methods (approaches) to value land exist:

In the **cost method**, the value is estimated as the current cost of reproducing or replacing the improvements (including an appropriate entrepreneurial incentive or profit) minus the loss in value from depreciation plus the land value.
In the **direct comparison method**, the value is indicated by recent sales of comparable properties in the market.
In the **income method**, the value is indicated by a property's earning power (cash flow), based on the capitalization of income.

The land valuation system must follow guidance principles as following, in order to build public confidence in the system:

- **Independence**: It must be ensured to be independence between valuation function and taxation function
- **Uniformity**: The land valuation practices must follow a unified standard from one area to another
- **Fairness and Equity**: The land valuation practices must follow the defined principles and procedure without discriminations
- Professional **competency** must be consisted
- **Accuracy and reliability** of valuation is provided and valuation updating must be defined
- **Transparency** in valuation process must be provided through participations and disseminations to all stakeholders and ability to appeal valuation on disagreement with valuation results is provided as well, in accordance with defined legal bases and procedure.
- **Affordability** of LV system and service
- **Predictability** (no surprises) of immovable property value (e.g., investors)
- **Accessibility** to supportive information, to self-prove accuracy and fairness
- **Income** or benefits received from valuation must expense or allocate to local for community development.

Traditionally, specific **appraisal techniques** are applied within the three methods to derive indications of immovable property value. One or more methods for property valuation may be used depending on their applicability to the particular appraisal assignment, the nature of the property, the needs of the client, or the available data. The sales comparison method can be interpreted as most reliable and transparent, but only if adequate comparable land transactions exist. Each method requires the gathering and analysis of data that pertains to

the property being appraised. To complete the valuation process, the appraiser integrates the information drawn from market research, data analysis and the application of the methods to form a value conclusion. The internationally consented process of appraising is the following:

- Define the market area;
- Inspect and describe the site and building;
- Collect property data (sales, listings, offers, construction costs and depreciation data);
- Analyze the market;
- Estimate the highest and best use;
- Estimate the market value of the site;
- Estimate the depreciated cost of the building;
- Estimate the market value.

4.1 Property Identification

Do not make the mistake of valuing the wrong property. Ensure that the civic address matches the legal description. The legal description includes: parcel number, village, commune, district and province. Check the location of the subject property on a map before going there for the inspection. If the owner is present at time of inspection confirm with the owner that the address is correct. Photograph the front and rear of the property and also the street to show neighbouring properties and the street itself.

4.2 Market Area Definition

Forces affecting value influence property values in a general area around a property. Within this general area are neighborhoods where properties have similar land uses. The appraiser must identify the boundaries of both the general area and the subject neighborhood because both impact on market value.

4.3 Site And Building Inspection And Analysis

Site Analysis: The site must be valued independently of the building. It is fundamental to understand the site before attempting to value it. This means that the appraiser must first understand the site's physical characteristics, the rights associated with it, how well it fits into its neighborhood, and its highest and best use, before selecting indices and before attempting site valuation. The field card will ensure that you record the important physical characteristics of the site, including its improvements because these are included in the value estimate of the site. On-site improvements include grading, landscaping, fences, paving, walks etc. Off-site improvements include access roads, sewer and drainage pipes. Describe the utilities including: sanitary sewers (or septic field), water system, electricity, telephone and storm drains or ditch. Appraisers and assessors are not qualified to identify pollutants or other environmental problems. Do not adjust for environmental problems when valuing the site, but do make a note if such impairments are obvious.

Building Inspection and Analysis: Estimating building costs requires an inventory of the building's components and proper assessment of its quality and condition. Sketch the building footprint on the field card, measure and write its exterior dimensions on the card. A building description includes: size, design, structural components, construction materials and mechanical systems. The field card will ensure that you record the important characteristics of the building.

4.4 Data Collection

Appraisal relies on the collection and analysis of appropriate data. Once organized and verified this data becomes information that is analyzed to provide a market value estimate. There are three types of data. The two most important are:

General Data: This data is used to analyze the forces affecting value. Sources of this data include: the web, government statistics, banks, university research centers, local real property companies; and

Specific Data: This data includes details about the subject property, indices and local market characteristics. This data is used to estimate highest and best use of the subject property. Sources of specific data include: local real property companies, newspapers, lenders, land development contractors, building contractors, owners and public records.

4.5 Market Analysis

Market analysis investigates the relationship between the demand for and competitive supply of real property in a defined market thus providing a basis for estimating highest and best use of the subject property. Clearly identify the subject property type and the market in which it competes. Analyze the state of the general market (forces affecting value), and then analyze the market within which the subject property competes. By investigating sales, offers to purchase, listings and the behaviour of market participants an appraiser can identify **supply and demand** relationships and trends. For example, because any type of market always seeks to be in balance, if there is a good supply of properties for sale that are similar to the subject property but demand is poor, then expect market values to be decreasing in order to create equilibrium between supply and demand. Always consider markets in terms of what is required to create equilibrium. If greater supply is needed, then expect market values to increase. If greater demand is needed, then expect market values to decrease. If supply and demand are in equilibrium, then expect market values remain level.

4.6 Highest And Best Use Analysis

In order to develop an opinion of market value of the site, highest and best use analysis identifies the most profitable, competitive use to which the site can be put. Highest and best use is the most reasonably probable use of the site that is physically possible, legally permissible, financially feasible and that results in the site's highest value. Test a site against each of these four criteria and estimate as highest and best use the use that satisfies all four. Conduct the tests in the order shown because the simplest test (physically possible) is the first criterion, the second is the next simplest, etc. If the site fails the first test then there is no need to conduct the second test, etc. There are circumstances where site value will be so great that the building will have no value and should be removed. Consider a valuable industrial site on which is built an older house. A purchaser who wants to build a warehouse on the site may pay a price for the land that includes no value for the house. The potential use, not the existing use, usually controls the price that will be paid for the site if that use is economically feasible.

4.7 Appraising And Assessment

Land valuation applications generally consist of two families of land valuer's activities: **appraising and assessment**. Both techniques are based on the same foundations and are thus subject to the same methods of valuation. Single appraising means detailed expertise, while assessment is a mass-application through coded structures for taxation purposes (e.g., property taxation, land transfer taxation, unused land taxation). Assessment serves as the link between valuation and taxation. Hence, mass appraising aims at private expertise while assessment is ordered from governmental authority in view of territorial inventory and ad valorem taxation on immovable properties. Assessment should be covered by law, especially

through land valuation ordinance and being submitted to a specific national policy such as national guidelines and technical standards. These should be constituted in **handbooks** on real valuation principles which follow international standards underlining a reliable and transparent process.

Definition	A formal opinion of value prepared as a result of a retainer, intended for reliance by identified parties, and for which the appraiser assumes responsibility.
Characteristics	Appraisal involves selective research into appropriate market areas, the use of appropriate analytical techniques, and the application of knowledge, experience, and professional judgement to develop an appropriate solution to a specific appraisal problem. The appraiser provides the client with an opinion of value on an immovable property that reflects market evidence.
Examples	An opinion of market value for an immovable property, leasehold estate, preservation easement, or other estate (e.g., to assist in mortgage lending decisions, to assist in purchase or sale decisions); an opinion of investment value or some other properly defined value of an identified interest in real estate at a specific date for specific objectives (e.g., for insurance and relocation purposes, or property tax appeals).

Table 2: Definition and meaning of “Appraisal”

Definition	The act of valuating the totality of the properties within a global territory by using mass appraising applications and processes.
Characteristics	The assessment is mainly done as a base for ad valorem property taxation. It should be regularly actualized (data actualization is permanently done; value actualization done on fixed cyclical base varying from yearly to once every three or five years). The quality of the results is inferior to the appraisal data, but the assessment has the advantage of producing permanent inventories and statistical data covering the entire country. Furthermore, assessment produces a neutral base for annual property taxation.
Examples	To finance municipalities, to support the cadastral actualization or specific types of infrastructure. The better the municipal services are the higher might be the property value and thus the tax rendering.

Table 3: Definition and meaning of “Assessment”

Mass Appraisal comprises**:**

- Support Ad Valorem taxation
- Support determination of cadastral fees
- Total territorial inventory of total value on immovable property
- Supports on future territorial zoning
- Budget and disaster response planning

Single Appraisal comprises**:**

- Support immovable property transferred, rented and exchanged
- Support financing and credit

- Support immovable property insurance
- Determine co-ownership value
- Determine capital gain on property
- Resolve litigations related to immovable property compensations for expropriations, property division and environmental damages.
- Support investment counseling, decision-making and counting etc.

Appraisal and assessment require market monitoring and data storage in a timely and updated manner for the purchase of prices, for rent prices and statistics regarding to construction materials (see Finkemeyer 2008). The land information system (LIS) will serve both as data storage and land valuation mapping in order to combine property and site related data (e.g., size, location, condition). This should happen to secure the updating of data bases and to ensure the integrity of the tax base on immovable properties to distinguish between data assessed values. It is essential to actualize the existing Data Bases (DB); this is considered as a permanent task for the assessor. When there are many and frequent modifications taking place on the same territory, the actualization is permanent. When there are few modifications occurring, then the actualization is done at least once a year with a rolling-back effect to the date of the effective change. Such modifications could be: Ownership modifications, change of the owner, modification of references (mailing address etc.), an enlargement or reduction of the components of an existing property which is already coded on a Property Record (PR) and in the corresponding Data Base, the construction of an additional building or the demolition of an existing compound.

To consider these modifications, the assessor must revise the property record and recalculate the value, but using the same unit-rates of valuation as already existing and amend the DB. This is essential to avoid distortions and unfair tax burden displacement. The property owner and tax payer must be notified to support their right of opposition in case of errors. Once the assessment roll is completed for the first time, the assessed values will gradually change by the effect of market/economical evolution. For many reasons, this type of actualization cannot take place every year because of insufficiency of market/economical indicators, the insufficiency of personal and of logistical means or excessive production cost. In most instances, this type of actualization will usually be done between three to five year-cycles.

Since land use control mechanisms (e.g., unified zoning measures) do not yet exist in many developing countries, for the training courses neighborhoods were identified where uses of the sites were similar; a typical USD per m² value was assigned as a benchmark site value for each neighborhood. Values within each neighborhood may vary according to differences in physical characteristics from the benchmark property, but they do not vary by use. Therefore, until land use controls have been created, the “highest and best use”-principle only analyzed the site. When indices are available, the preferred method of estimating the market value of a site is the direct comparison method, as mentioned before. Indices were defined as the comparable sales, listings for sale, and offers to purchase that were comparable with the subject site in order to estimate the market value. Situations may occur frequently where there are no site indices due to the informal and intransparent land market; then an estimation of the depreciated cost of the building is deducted from the sale price of the property. For example, if the site value of a single-family residence is needed, then sales of single-family residences with older buildings can be found. The reason for researching older buildings is because the main component of value is the site thus the building contribution is typically small and relatively easy to identify.

Example for market valuation in Cambodia by using the cost method:

The four properties located in an urban pilot project (Phnom Penh) as listed in **Table 4** were sold at the prices being indicated. The site value of each of the sales is estimated by firstly adjusting the sale for market conditions to July 1, 2012 and then subtracting the contributory value of the building from its sale price. Once the site values for the indices are found, an adjustment can be made. The site value range is narrow at 82,000 USD to 85,000 USD per site, but the price per m² range is wide at 467 USD to 607 USD per m². In this neighborhood, the price level indicates that the site size is larger than what is needed to build a house adding little extra value. However, this may not be true for all neighborhoods; hence an analyzing of each situation will be required. Generally, in the following example the site value plus depreciated replacement cost new can be fixed as the market value as at July 1, 2012. Using a single-family detached example, if median site value in the subject neighborhood, as at July 1, 2012, is estimated by the survey of opinions to be 100 USD per m² and if the subject site is 300 m², and no size adjustment is required, then its site value is 30,000 USD. If the depreciated costs of the 120 m² are dwelling from the building cost table (170 USD per m²), its depreciated cost is 20,400 USD. **Result**: The market value by using the cost method – as at July 1, 2012 – was estimated to be 50,000 USD.

Land value	30,000 USD
Depreciated building cost	20,400 USD
Market value	50,400 USD, rounded to 50,000 USD

Table 4: Market value by using the cost method (simplified)

To sum up, the introduction to the cost method has successfully trained the course participants to adjust replacement cost data and to gain land market information. Tables of replacement costs are meanwhile available at least for whole Phnom Penh where they base on geographical site information (GIS; satellite images etc.) at a specific date. However, these data have to be adjusted in view of time and location.

4.8 Human Resource Development (HRD)

HRD consists of: Institutional capacity building through promoting land assessment and single appraisal skills to get university level and providing basic knowledge of land valuation to implementing officials and encouragement. Human resources relating to specific skill have to be promoted and developed in those skills. International support: A university already recognized on Real Estate Valuation Training is needed to support the LVM development and professional training at university level. The goals aim at the establishment of institutions in charge of preparing instructions, monitoring and evaluation of the implementation process through agencies especially by:

- Management structures, powers, rules, duties, and decentralization delegations that are arranged; the setting up of an independent national valuation association including professional and technical teams;
- Human resources relating to specific skills for appraising and assessment which have to be defined as required;
- The kinds of work, scope and clearly defined and required services;
- Data management methodologies (e.g., for legal and fiscal cadastre) and data dissemination that has to be defined by law.

4.9 Processes for Attracting Participation

Appeal rights for result of land valuation must be provided to related beneficial persons and managed by a neutral body. Provide right to accurate & fair assessment; Provide right to access information and data. Make sure that the result of land valuation or actualization must be informed and/or public display and reporting. Any wrong doers both public and private sectors must be fined and punished. Make sure that land value information through revaluation must be regularly updated on fixed periods. Provide service and information transparent and accessible way. Promote effective and responsive through deconcentration. Provide clear assessment ratio to attract participation.

4.10 Public Relation and Cooperation

The land valuation implement agency, relevant public sectors, private sector and the public must keep good relations and cooperation, and exchange data and information as needed among each other in order to ensure consistency of land valuation practices through out the country.

5. Land Taxation

A proper land taxation system is crucial for a successful land use policy. In the past, the developments on land markets partially counteracted the intentions of the land reform: To allocate land to peasants and to safeguard their livelihood. Land speculation, land grabbing, land concentration, land disputes, and evictions have been aberrations that were caused by the described price hikes.

The land tax is always an attenuation of property rights. Hence, it needs a sound justification. Before implementing land taxation, some base questions have to be answered: Which tax might be justified best? Land (immovable property) taxation policy includes many aspects. On the one hand, land taxation should bring fiscal revenues, but on the other hand some important guidelines have to be fixed before projecting the taxation: Which tax base is most easy to administer and to assess? Which tax base is justifiable? Which brings sustainable and high fiscal revenues? Will the tax be accepted and easily be understood by the tax payers and the taxation departments as well? Particularly for valuation purposes it has to be asked whether the tax is levied annually and in a comprehensive way (as the property tax) or only occasionally (as betterment tax) (see **Table 5**). Does it make sense to use the same tax base and the same valuation methods for different sort of taxes regarding to land such as unused land taxation, income taxation, property transfer taxation, and capital gain taxation?

Especially if the land tax is levied annually and in a comprehensive way, mass valuation (appraisal) is necessary. Mass valuation always faces a trade-off between efficiency and justice. On the other hand, also aspects beyond fiscal revenues have to be considered. In developing countries, land taxation is discussed more and more as a tool for land use and settlement policy. The better the municipal and rural services – financed by taxation – are, the higher might be the property value and thus the property tax rendering for the State's revenues. It is requested to support land use planning and ecological targets, without trade-offs of the targets and distortions of the land markets. These and other aspects need systematic analysis and examination. Maybe different answers have to be given for different institutional environments.

Land as tax base	Value	Auxiliary tax base (e.g., size)
Land (as isolated tax base)	Site value tax Betterment tax (Income tax)	Site tax
Land and building (as compound tax base)	Property tax (Property transfer tax) (Income tax)	Simplified property tax

Table 5: Taxation of land (isolated) and land (with improvements)

Moreover, different developing countries have different stages of institutional development and governance; there is hardly any "one size fits all"-approach for property taxation since different stages of development, different cultures etc. have to be taken into account. Basically compound tax bases or only the taxation of unimproved land is possible. In this case, the property tax might be based on the value of property or on auxiliary tax bases, e.g., the size of a plot. The burden of land taxes falls entirely on landowners; a land tax is neutral. It does not distort economic decisions and thus does not generate an excess burden. A land tax has no impact on the timing of site development. In addition, land taxation may pursue other purposes than only fiscal revenues. Some tax bases may support the planning system, others may set disturbing incentives. Hence, urban sprawl, the loss of fertile land due to real estate projects for infrastructure etc. might be supported, which is not desirable for many (in particular ecological and biodiversity) reasons. Regarding **alternative tax bases**, land use planning should be supported and not foiled by the tax (base). Incentives in regard of landscape protection, uncontrolled development, and urban sprawl should be given by the land tax and should support a just, transparent and sustainable urban and rural development.

5.1 Principle of land taxation in developing countries: Distribution and justice

It has to be analyzed whether a tax base is lifting prices and rents or gives pressure on them. Can the tax be shifted (distribution impacts) to tenants or lessees? The impacts on distribution and social consequences have to be assessed before taxation. Furthermore, tax bases have to be analyzed in terms of equity, if they put in place systematically advantages or disadvantages for certain groups. A just tax base would treat all tax payers equal. Efficiency affords simplifying methods. A just valuation needs to be accurate, and it has to be carefully taken into account how much simplification is just and reasonable without a violation of the essential principle of equality in taxation and if there are any distortions of the market to be considered (e.g., a tax wedge). Economic activity should be stimulated, the transaction volume of land and buildings should not be hampered, and the construction industry should be supported.

5.2 Insufficient Unused Land Tax

The tax on unused land seems to be insufficient as well, since there are disputes whether land can be clearly defined as "unused" or not. Instead, the tax authorities in developing countries could consider different strategies dealing with the phenomenon of land speculation, e.g., by selling or leasing the State land to private investors (in particular for foreign direct investment; FDI) under the condition that the desired development of the land has to be granted by the landowner/investor within a certain period. If the landowner/investor fails to fulfill this condition with the consequence that the land remains "unused", this plot may fall back to the government. The investor would receive the investment back which he paid for the land, but without compensation for the unearned "windfall profit". In order to avoid such discussions, the "naked" land should be taxed without regarding the actual use – it should be a land value tax (LVT) which is described in the following.

5.3 Recommendation for the tax on “naked” land: Land Value Tax (LVT)

For the land value taxation (LVT), taking only site (land) values without buildings or other improvements is characteristic. The LVT was highly influenced by Henry George and his “single tax”-approach as a value capture instrument, meaning a recurrent tax by which annual “windfall profits” on land ownership from community growth or public investment are consequently taxed away to support land reforms or to achieve an equal distribution of wealth amongst the people. The rate for the LVT should be fixed, without being changed according to the actual use of the site. A fixed tax rate always results in the same tax burden for the owner. The owner of the land cannot avoid the tax if it has the character of a fixed cost. The only way to lower the effective burden of the tax is to use the site (brownfields) efficiently. Potential rent-seeking processes cause windfalls by increased land values and demand for land for construction or agriculture investments. Today, basic information on land and property sales, on land valuation systems and techniques for property tax and land value tax are limited in most developing countries. In the future, much more detail is needed to justify about the sustainability of a future simple revenue generation system, e.g., through computer-assisted mass appraisal options (CAMA) which base on the IAS-defined market value. The assessment of the tax base could be carried out by committees according to the blueprint of the German land assessment boards (“Gutachterausschüsse”; see § 192 Federal Building Code), which are public land assessment service agencies. These boards of valuers collect data of all land transactions and set out annual guiding values of unimproved land (“Bodenrichtwerte”) for zones of plots with similar characteristics.

6. Conclusion

By improving prior assessment tools for mass valuation and for a property tax based on the assessed value of the property, land taxation could serve as an innovative instrument for public finance in order to broaden the fiscal revenue in developing countries. Valuation and taxation are particularly important in countries where rent-seeking, informal land markets and an unequal land distribution occur. Moreover, capacity building at Universities, workshops and through “Summer Schools” for land valuation experts, for taxation, economy, and legal education is essential. Without these preconditions, assessment applications for fair taxation and transparent valuation will loose the public trust due to important errors and weak governance. To sum up, there is a fundamental difference between appraising and assessment – as it is between valuation and taxation which never should be mixed up.

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Appendix: Important Terminologies

Land Valuation System: is a relationship among four components including legal framework, institutional, technical and economical sectors which have interaction to each other to determine land value, to record and manage land price data and information for serving the main purpose of land registration service, land taxation and other specific purposes.

Assessment: The act of doing mass appraisal for systematic valuation of the totality of the immovable properties of an entire territory at a given date utilizing standardized procedures and statistical testing. Assessment is generally applied for ad valorem property taxation. Mass appraisal is using the same approaches or methods than for appraising but through coded, systematized and simplified processes.

Single Property Appraisal: is a formal opinion of value of a property intended for reliance by identified parties, and for which the appraiser assumes responsibility. The result is a specific valuation for a specific private purpose and used by the client.

Price: The amount a particular purchaser agrees to pay and a particular seller agrees to accept under the circumstances surrounding their transaction. A price, once finalized, refers to a sale or transaction price and implies an exchange; a price is an accomplished fact.

Cost: The total dollar expenditure for an improvement (structure); applies to production, not exchange (price). Appraisers distinguish among direct (hard) costs, indirect (soft) costs, and the cost of entrepreneurial coordination.

Value: (1) The monetary worth of a property, good, or service to buyers and sellers at a given time. (2) The present worth of the future benefits that accrues to property rights ownership.

Market Value: is the most probable selling price, as of a specific date, in cash, or in terms equivalent to cash, or in other precisely revealed terms, for which the specified property rights should sell after reasonable exposure in a competitive market under all conditions requisite to a fair sale, with the buyer and seller each acting prudently, knowledgeable, and for self-interest, and assuming that neither is under undue duress.

Assessed Value: The value of a property is according to the official assessment listing or to the tax rolls (in some foreign countries) in ad valorem taxation. It may be higher or lower than market value or based on an assessment ratio that is a percentage of market value.

Anticipation and Change: Value reflects both the market's anticipation of the future benefits of acquisition of real property and changes in the forces affecting value. Appraisers attempt to identify current and anticipated changes in the market that could affect market values. The physical, functional and economic changes in buildings as they age result in depreciation, which is defined as a loss in value from any cause. Depreciation is the difference between the cost to replace a building and its present value.

Supply and Demand: This is perhaps the most important determinant of value. If the supply of a particular type of real property decreases but demand does not change, then market value should increase. When there is both a decrease in supply and an increase in demand then an even greater increase in market value can be anticipated. Various combinations of supply and demand exert different effects on market value. The supply of real property is dependent on the costs of the agents of production. When demand increases for a certain

type of real property there is greater opportunity for profit and developers and builders will increase the supply of that type of real property in order to maximize profits.

Competition: Prospective purchasers compete with each other to purchase a specific property. Vendors compete with each other to sell similar properties in the same market. Interaction between competing purchasers and competing vendors results in the establishment of market values within a definable range in a neighborhood. As competition changes market values change. For example, if the number of purchasers decreases but the number of properties for sale remains constant then decreased competition (a decrease in demand) will result and market values will probably decrease as vendors adjust their prices downward to reflect the decrease in demand.

Substitution: A buyer will not pay more for one property than for another that is equally desirable. The price of acquiring an equally desirable substitute property tends to set property value. If two identical new houses, side-by-side, are for sale, but at different prices, then the principle of substitution indicates that the lower priced house will sell first (refer to the definition of market value that states that the buyer acts prudently and with self-interest).

Balance: Economic balance is achieved when the combination of site and building is optimal. In a neighborhood where the typical house is a 100 square metre (m²) dwelling with two-bedrooms on a 150 m² site, then the principle of balance maintains that it would be unwise to construct a 250 m² five-bedroom house because this would not be optimal balance in this neighborhood and the profit per m² of construction would probably be less than if a two-bedroom house were built.

Conformity: Property value is created when the characteristics of a property conform to the demands of its market. For example, an expensive property will be worth less in a low-priced neighborhood than it would in a neighborhood of comparable properties (principle of regression which is a subset of the principle of conformity); and an inexpensive property will be worth more in a high-priced neighborhood than it would in a neighborhood of comparable properties (principle of progression which is a subset of the principle of conformity).

Valuation Mapping: Valuation mapping is one of the necessary steps to realize valuation of immovable properties. This step consists of building a sub-layer of the cadastral system integrating: units of neighborhood, agriculture valuation, natural resources, infrastructures etc. Then this valuation mapping is serving as a mould integrating data and analysis conclusions. In all instances and whatsoever is the language, this type of mapping is a sub-layer of the cadastral system and part of a territorial information system (Géomatics). Whereas, other valuations of construction attached to the land base on other methods and global standards.

Land Valuation Mapping

IMMOVABLE PROPERTY RECORD

1 ASSSESSMENT FOLIO NUMBER: _____

2 PROPERTY ADDRESS _____ _____ _____
STREET NAME / No. / SECTOR / SECTION / LOCAL REF.

3 CADASTRE REF [ ][ ][ ][ ][ ]
PROV / DISTRICT KHAN / COMMUNE SANGKAT / VILLAGE / PARCEL
MAP No _____
PARCEL _____
SIZE _____

4 **OWNER**
NAME _____ REFERENCES _____
DISTRICT MAILING ADDRESS(If Different than Property Address) _____
TITLE [ ][ ] Y N
TRANSACTION DATE ___ / ___ / ___ D / M / YR
REGISTRATION DATE ___ / ___ / ___ D / M / YR
DECLARED SELLING PRICE _____ US$
CASH _____ US$
FINANCING CONDITION _____
RESTRICTIONS ON RIGHTS _____
4-1
OFFER FOR SALE [ ][ ] M YR
LISTED PRICE [ ] US$

5 **OCCUPANT:** SAME AS OWNER [ ] Y [ ] N IF NO COMPLETE NEXT LINE
NAME _____ REFERENCES _____
REASONS OF NO OWNERSHIP: 1.NO CADASTRE [ ] 2.NO SPORADIC REGISTRATION [ ]
3.NO ESSAY ON SPORADIC REGISTRATION [ ] 4.PARCEL BOUNDARY CONFLICTS [ ]
5.OTHER [ ]
6 _____
EFFECTIVE OWNER(IF NOT AS LISTED IN BLOCK #4)

6 **EFFECTIVE PREDOMINANT USE:**
RESIDENTIAL [ ]
COMMERCIAL [ ]
INDUSTRIAL [ ]
SERVICES [ ]
NAT. RESOURCES [ ]
AGRICULTURE [ ]
FOREST [ ][ ]
TRANSPORT/COM [ ]
CULTURE/SPORT [ ]
VACANT PROP. [ ]
MULTI USES
SHOP- HOUSE [ ]
COMM-HOUSE [ ]
VARIOUS [ ]
OTHER USES [ ]
UNIT OF NEIGHBOURHOOD PROFILES:
REF. NO [ ]

7 7-1 ROAD
NATIONAL [ ] NARROW [ ]
BUSY [ ] PATH [ ]
COMMERCIAL [ ] PAVED [ ]
SEMI-COMMERCIAL [ ] NOT PAVED [ ]
RESIDENTIAL [ ] CORNER [ ]
SECONDARY [ ] BAD [ ]
RURAL [ ] DOUBLE FRONT [ ]
NO ISSUE [ ] OTHER [ ]

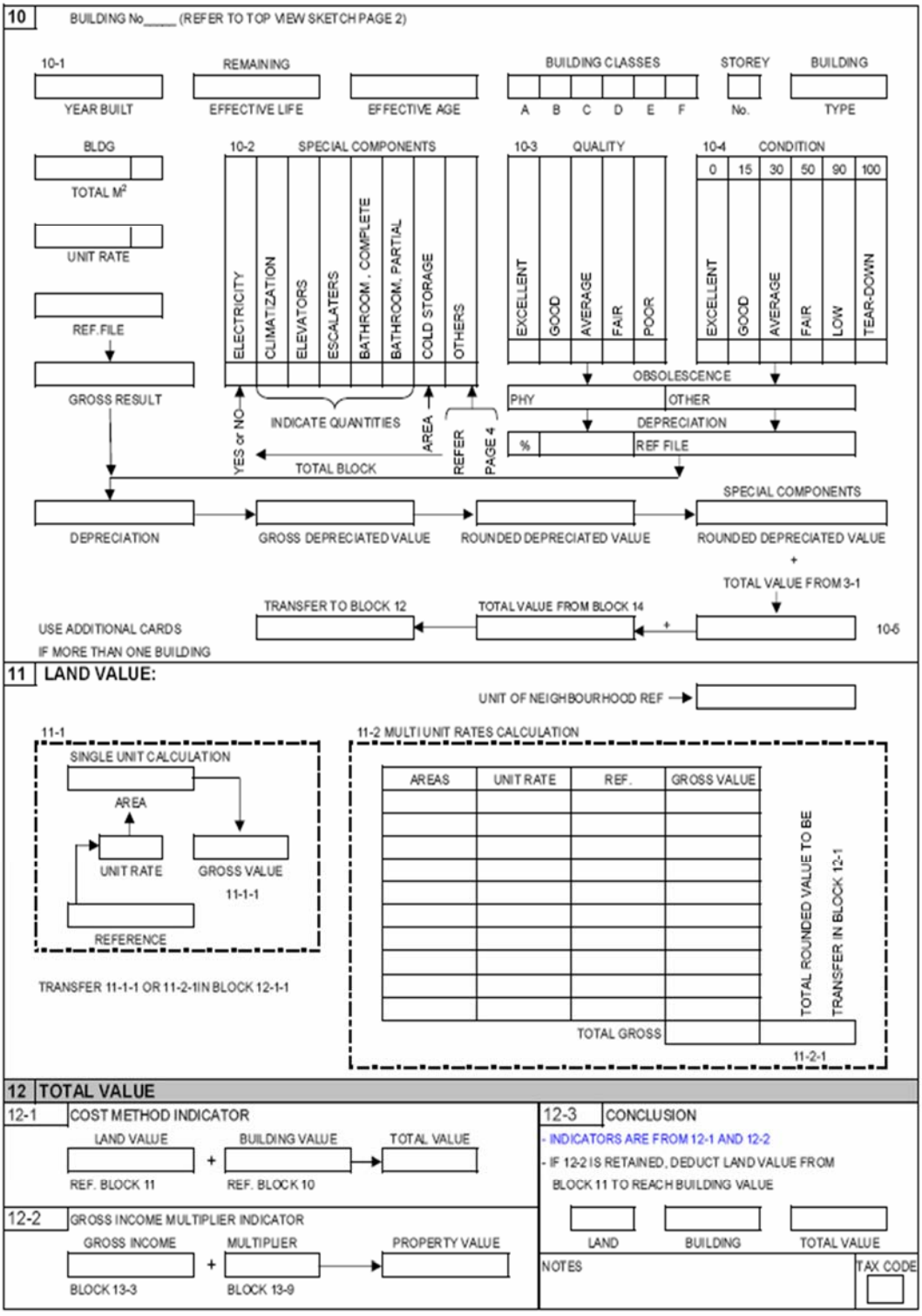
7-2 SERVICES
SEWER NETWORK [ ]
WATER NETWORK [ ]
WATER WELL [ ]
SEPTIC [ ]
ELECTRICITY [ ]
STREET LIGHT [ ]
SIDEWALK [ ]
OTHER [ ]

7-3 OTHER CHARACTERISTICS
SQUARE LOT [ ] STEEP SLOPE [ ]
RECTANGULAR [ ] MODERATE SLOPE [ ]
PIE SHAPE [ ] ABOVE ROAD [ ]
EXTREM SHAPE [ ] BELOW ROAD [ ]
T-LOT [ ] DIFFICULT ACCESS [ ]
PRIME VIEW [ ] SUBDIVIDABLE [ ]
FAIR VIEW [ ] NON-BUILDING [ ]
WATER FRONT [ ] OTHER [ ]

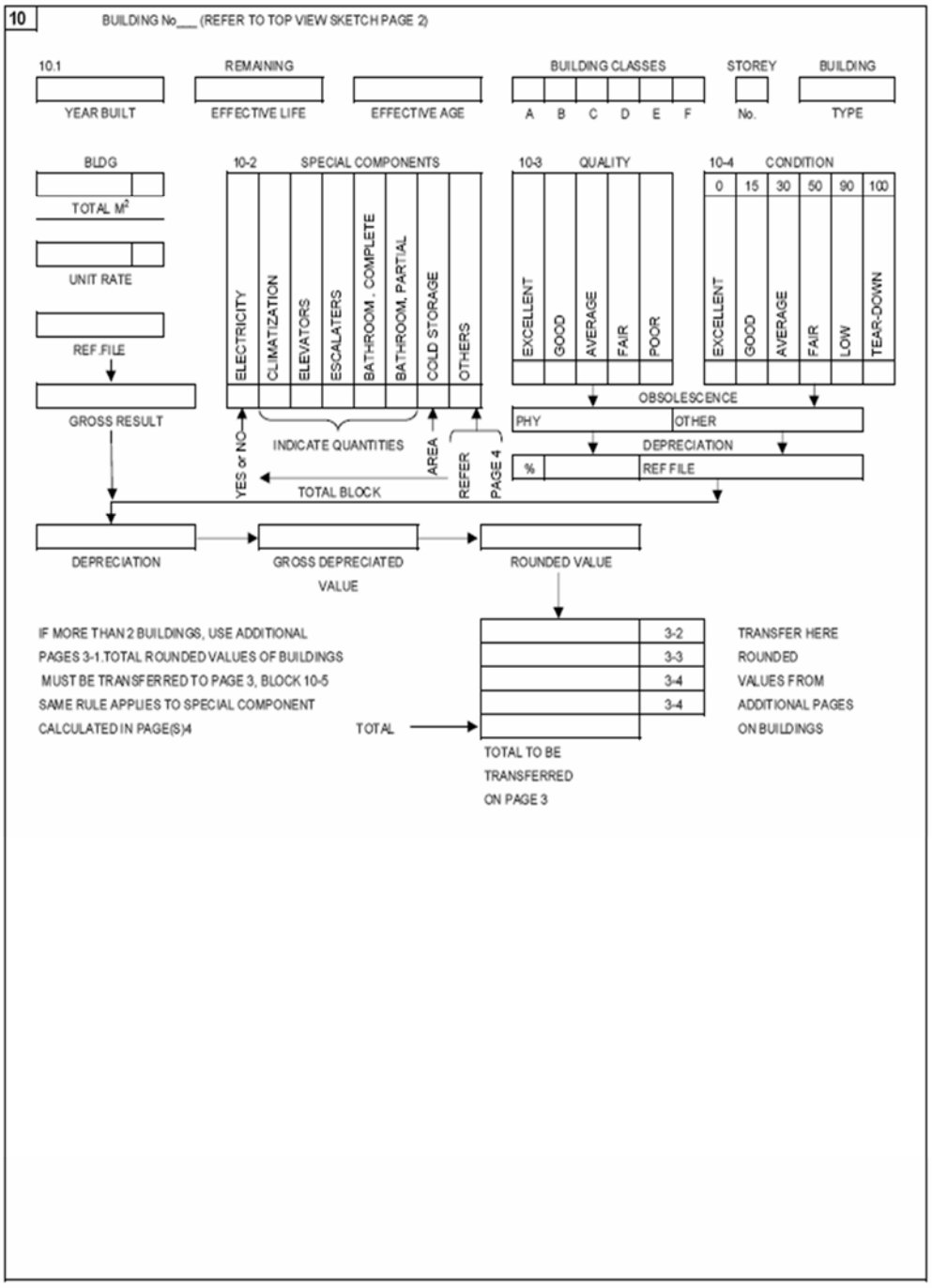
VERSION 1

1

IMMOVABLE PROPERTY RECORD
BUILDING DESCRIPTION AND VALUATION / LAND VALUATION / TOTAL VALUE



IMMOVABLE PROPERTY CARD
BUILDING-ADDITIONAL RECORD PAGES



IMMOVABLE PROPERTY RECORD
LEASED PROPERTIES AND SPECIAL EQUIPMENTS

13 LEASED PROPERTIES

NOTE: PAGE 3 OR 3-1 - BUILDING DESCRIPTION IS NECESSARY

13-1 USE/CODE	13-2 AREA	13-3 RENT	13-4 VIEW		13-5 IMMEDIAT/NEIGHBOURHOOD	
REFER BLOCK 6	TOTAL BUILDING	GROSS ANNUAL	STREET	GOOD	HOMOGENOUS	NOISY
APPLY SAME CODES	RENTED AREA IN SQ.MTR.	INCOME (US/$)	SIDE	FAIR	NON HOMOG	PLEASANT
		$	BACK	BAD	QUIET	DIRTY

13-6 SERVICES INCLUDED IN THE RENT

GUARDIAN	DISHWASHER	CLIMATIZ	PAINTING
JANITOR	STOVE	HOT WATER	CLEANING
MAID	REFRIGERATOR	INT.PARKING	GARAGE COLLECT
FURNITURE COMPLETE	CLOTH WASH.MACHINE	EXT.PARKING	SEWER CHARGES
FURNITURE PARTIAL	CLOTH DRYER	SWIMMING POOL	WATCH CHARGES
ELEVETOR	ELECTRICITY	SPORT CENTER	INTERCOM
LIFT	GAZ	STORAGE	ANTI BURGLER SYSTEM
OTHER (PRECISE)			

13-7 NOTES :

13-8 MARKET/ REF.
SALES ON COMPARABLE PROPERTIES FILE NO

13-9 G.I.M
GROSS INCOME MULTIPLIE
REF. FILE

BLOCK 12 ON TOTAL PROPERTY VALUE WILL INTERATE THE GI/M APPLICATION

14 SPECIAL IMMOVABLE COMPONENTS

			UNIT RATE	REF.FILE	GROSS
-VAULT(BANK) :		AREA	X		
-PARKING PRIV. :		AREA	X		
ASPHALT		Y or N	X		
EARTH		Y or N	X		
LIGHTING POST		NUMBER	X		
- Fence :		LENGHT	X		
- SERVICE STATION					
PUMPS		NUMBER	X		
UNDERGROUND TANKS		VOLUME	X		
-PETROLEUM TANKS ABOVE GROUND :	No	VOLUME/EACH	X		
- ELEVATORS	No	FLOOR NO.	X		
- AUT. STAIRS	No	FLOOR NO.	X		
- OTHERS			X		

TOTAL GROSS VALUE

TOTAL GROSS VALUE

DEPRE-CIATION

REF. FILE

ROUNDED NET VALUE

TRANSFER TO BLOCK 10

15 INSPECTOR'S SIGNATURE + REF. DATES

NAME IN BLOCK	SIGNATURE	DATE (D/M/Y)	NAME IN BLOCK	SIGNATURE	DATE (D/M/Y)

Land Valuation Mapping is one of the preliminary steps to be done on assessment applications. Land valuation mapping is complementary to the cadastral system; in fact it supports the GIS cadastral system. It is a sub-layer of it. Land valuation mapping consists on integrating on a map (a copy of the cadastral map) the following data:

- Units of neighborhood
- Units of assessment
- Economical indicators
- Unit-rates of assessment to calculate the assessed values on the immovable properties
- Some statistical data or symbols

Units and neighborhood and units of assessments are object of explications in following chapters. Nevertheless the following points must be presented now to facilitate their understanding within the present chapter:

- Units of neighborhood: They are territorial polygons into which the 4 forces affecting value have the greatest points of similitude or proximity. In fact these polygons are like a mould into which the market indicators are located referring to tables of analysis and concluding to unit rates of assessment to calculate the assessed value of each property.

- The four forces affecting value are:

    1) Physical: types of construction and their uses
    2) Economical: sales, offers and demands, mortgages, rents
    3) Legal: zoning, permitted and restricted uses, easements, rules of constructions
    4) Social: Profiles of the persons living in that unit of neighborhood.

- Unit of assessments are regrouping as a single unit, various cadastral parcels to the same owner, being adjacent, with the same predominant use, and that would normally be sold as a single property.

- Economical indicators and Unit-rates of assessment: They are the results of analysis. In a preliminary step, the economical indicators are located on the map using coded symbols with reference number to a table of analysis. From these tables conclusions expressed in meters are located on the map and will be used to assess properties.

Note: Land Valuation Mapping as previously summarized is already applied in many countries and even in countries with limited resources and experience. More sophisticated and digital means are available but before running it is normal to firstly learn how to walk.

When cadastral maps are not available, then other solutions are temporary used such as: satellite imagery or/and geographical sketch done by hand on site. Great precision is not requested. As previously indicated, Land Valuation Mapping is a **sub-layer of the cadastral system** due to the concept of immovable property based on the land and therefore on the cadastral parcel. Such integration to the cadastral system is a world reality through GIS tools.

Units of Neighborhood

The unit of Neighborhood concept has for effect to structure the profile of the distinctive parts of a territory having the greatest characteristics of similarity. Characteristics of the unit of neighborhood are derived from the four strengths (forces) affecting value: such as:

a) Physical: type of constructions; types of infrastructure (types of roads, paved or not); types of services such as sewer, water system, etc);

b) Economical: Market indicators such as selling prices; rents, mortgages;

c) Legal: Rules of construction; Permitted and restricted uses; Rules applicable to territorial planning and development;

d) Sociological: Profile of the population in that unit; Level of familial earnings;
Example: Single residential properties with: average area/age/quality/type of infrastructure/generally sold between USD xx and USD xx; Middle class population, etc.

Coded description of these units will support data analysis and the definition of the unit-rates of valuation. Into these units of neighborhood mapping, the market data indicators are localized and inserted using some specific symbols (circles, polygons, ovals, squares, etc); the reference number inside each symbol is referring to a list into which a summary of the market indicators is structured and analyzed with conclusions. Each list will conclude on unit-rates of valuation applicable inside each unit of neighborhood.

In fact, the unit of neighborhood is like a mould structuring data to be analyzed and is determining values through unit rates of value applicable by units of square meters. In these units, the information coded in the Property Record are important and must be considered (property effective use, road quality, local services available such as water, sewer, electricity, street lights, etc, and multi other characteristics as coded in the Property Record). When some units of neighborhood do not have sufficient quantity of economical indicators, then it is possible to import indicators from other units of neighborhood having the same profile. Then, it is necessary that each unit of neighborhood be numbered from the same logic and also with a similar logic to describe the profile of such unit.

To perceive the pertinence of the units of neighborhood it must be understood that market data indicators must be regrouped in relation to the various types of properties and uses; economical data of single residential houses must not be confused with market data indicators on office buildings. In many countries the units of neighborhood is also named unit of homogeneity. In countries where there is no statutory and effective zoning with corresponding rules or field controls or inspection and permits of construction, it is impossible to use the expression Unit of Homogeneity because there is no homogeneity between the properties in the same neighborhood.

The absence of zoning and of territorial planning rules is complicating the assessor’s tasks; unfortunately it is a reality in the majority of the countries in emergence. In some countries where a part of the population has no access to internet or is not familiar with administrative procedures on assessment, the units of neighborhood are localized on a large map integrating each property (unit of assessment) with at least the following information:

- Name of the owner of each property
- Total assessed value of each property

This map is presented in public sessions and a monitor is providing explanations and answering to questions. These sessions are highly appreciated. To facilitate the

understanding of these maps, the units of neighborhood are shown with color and legends (residential of distinctive level of qualities, condominiums, commerces, shop-houses, commerce-houses, light industries, heavy industry, shopping centers, various types of agriculture, forestry, etc), these colors and legends are adapted to each territory.

Legal frame: The assessor must apply the concept of units of neighborhood as defined in the corresponding methodological guide. When actualizing the assessed values, he must study the necessity to revise the perimeter and the profiles of every unit of neighborhood.

Units of Assessment

The unit of assessment is also named Unit of Valuation in some countries. This unit is assembling distinctive land parcels forming a single property to the same owner, under a main predominant use and that normally would be sold as an entire property. The application of this concept responds to the following objectives:

a) Reduce the obligation of fractioning the economical indicators on multi cadastral parcels of a global property.

b) Regroup in a single assessment entry on the assessment roll (listing) properties composed of many adjacent parcels to a same owner and forming a unique immovable property.

Some cadastral concepts & systems are delimitating the cadastral parcel to a polygon being closed (continuous peripheral lines forming a block) and not cut by roads, railroads, rivers or the equivalent which are in fact other distinctive cadastral parcels. Then, a global property might include more than one cadastral parcel. The application of the concept of unit of assessment has for effect to assemble together parcels forming in reality a unique entity and therefore facilitating value calculation.

Furthermore, the application of this concept eliminates the dissection of sales price on a property formed by more than one adjacent cadastral parcel and that was sold under a global and unique selling price. Such a dissection is hazardous. This concept is largely applied in many countries. In many countries a legislative provision was needed (or a decree, sub-decree or a regulation). This legislative provision is necessary due to the exception facing the cadastral system. These units of assessment are located on land valuation mapping.

Sketches presented on next page illustrate the problematic and the solution. In that example there are four (4) cadastral parcels to the same owner. These parcels constitute a unique and global property that normally would be sold as a global entity. By adding a symbolized liaison link it is then indicated that due to the concept of unit of assessment these parcels form a unique property with a global value. This problematic was observed in the totality of the countries where the Canadian expert author of this document was involved. There, the solution resulting from the unit of assessment concept was applied with success. It is noted that this problematic is more frequent in rural areas but also in any country where the cadastral system is not renovated, not actualized or deficient whatsoever is the reason. Where the cadastral system is still to be done, the map on units of assessment is used as preliminary and temporary mapping reference.

This type of application is resulting in a specific problem easy to solve. This problem is the reference number to be shown on the assessment roll and on the property record. How to deal with many cadastral numbers? Which one will be used as the official reference or do we

have to use them all? In some countries this reference number is the cadastral one whatsoever their quantity, while in some other countries the reference number on the assessment roll is distinctive from the cadastral ones. When the aforesaid reference is the cadastral number, then the totality of the parcels forming the unit of assessment are indicated with the peripheral dimensions of the global unit of assessment; therefore total area is also mentioned. The problem related to the reference number to use has always been solved easily, the advantages of the unit of assessment being more important.

When the Unit of Assessment map is preceding the cadastral one, an agreement with Land & Cadastral Authority is necessary to determine temporary identification code of these units (reference number).