

Concepts and definitions

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Introduction

2.1. The concepts and definitions that are of importance for the item land are scattered over many chapters and paragraphs in the SNA 2008 and ESA 2010. They are combined in this chapter and presented in a systematic way. Where necessary, this chapter describes how the SNA 2008 and ESA 2010 concepts should be applied to and interpreted for land. However, the chapter will not discuss the practical application, measurement and way of compilation and estimation. This is done in the following chapters.

2.2. The chapter begins by addressing some general aspects of land as a balance sheet item. It presents the position of land on the balance sheet as defined in the SNA 2008 and ESA 2010. It discusses the definition of the asset ‘land’ and its aggregates. Clarifications on definitions and borderlines of the asset land are provided as well.

2.3. The remaining parts of the chapter deal with several conceptual issues that are relevant for land. In these parts the scope is not limited to land as a stock, but changes in the stocks of land — transactions and other changes — are

considered as well. Attention is successively paid to the topics of ownership and economic benefits from land, ownership related to the lease of land and public-private partnerships, land in the system of national accounts (stocks and flows), valuation of land, time of recording, netting and consolidation, data issues in the measurement of flows of land.

Position of land on the balance sheet and definitions of land and related assets

Position of land on the balance sheet

2.4. Land is an asset on the balance sheet of a country and its institutional (sub)sectors. Land is a subcomponent of the broader asset category natural resources, which in turn is a component of non-produced non-financial assets. Table 2.1 below illustrates the position of land on the balance sheet.

Table 2.1: Balance sheet according to the SNA 2008 and ESA 2010

Assets			Liabilities and net worth		
AN	Non-financial assets	4 621	AF	Liabilities	7 762
AN.1	Produced non-financial assets	2 818	AF.1	Monetary gold and SDRs	0
AN.11	Fixed assets	2 579		Etc.	1 471
AN.12	Inventories	114			
AN.13	Valuables	125			
AN.2	Non-produced non-financial assets	1 803			
AN.21	Natural resources	1 781			
AN.211	Land	1 001			
AN.212	Mineral and energy reserves	443			
AN.213	Non-cultivated biological resources	103			
AN.214	Water resources	88			
AN.215	Other natural resources	146			
AN.2151	Radio spectra	91			
AN.2159	Other	55			
AN.22	Contracts, leases and licences	22			
AN.23	Purchases less sales of goodwill and marketing assets	0			
AF	Financial assets	8 231			
AF.1	Monetary gold and SDRs	770			
Etc.	Etc.	1 482			
			B.90	Net worth	5 090

Source: TF on Land and other non-financial assets, based on ESA 2010, fictitious data

Definitions

2.5. The SNA 2008 defines a balance sheet as ‘a statement, drawn up in respect of a particular point in time, of the values of assets owned and of the liabilities owed by an institutional unit or group of units’ (SNA 2008 paragraph 13.2). Similarly, according to the ESA 2010 a balance sheet is ‘a statement, drawn up for a particular point in time, of the values of assets economically owned and of liabilities owed by an institutional unit or group of units’ (ESA 2010 paragraph 7.01).

2.6. An asset is a store of value representing a benefit or series of benefits accruing to the economic owner by holding or using the entity over a period of time. It is a means of carrying forward value from one accounting period to another (SNA 2008 paragraph 3.30, ESA 2010 paragraph 7.15).

2.7. Non-financial assets (AN) are non-financial items over which ownership rights are enforced by institutional units, individually or collectively, and from which economic benefits may be derived by their owners by holding, using or allowing others to use them over a period of time. (ESA 2010 Annex 7.1). Non-financial assets are divided into produced (non-financial) assets (AN.1) and non-produced (non-financial) assets (AN.2).

2.8. Non-produced assets (AN.2) are non-financial assets that have come into existence in ways other than through processes of production (SNA 2008 paragraph 10.9b). Non-produced assets consist of three categories: natural resources; contracts, leases and licences; and purchased goodwill and marketing assets (SNA 2008 paragraph 10.14). According to the ESA 2010 non-produced non-financial assets are economic assets that come into existence other than through processes of production. Non-produced assets consist of natural resources, contracts, leases, licences, permits, goodwill and marketing assets (ESA 2010 paragraph 7.24).

2.9. Natural resources (AN.21) as defined in the SNA 2008 consist of naturally occurring resources such as land, water resources, uncultivated forests and deposits of minerals that have an economic value (SNA 2008 paragraph 10.15). According to the ESA 2010 natural resources are non-produced assets that naturally occur and over which ownership may be enforced and transferred. Environmental assets over which ownership rights have not, or cannot, be enforced, such as open seas or air, are excluded. Natural resources consist of land, mineral and energy reserves, non-cultivated biological resources, water resources and other natural resources (ESA 2010 Annex 7.1).

2.10. Land (AN.211) consists of the ground, including the soil covering and any associated surface waters, over which ownership rights are enforced and from which economic benefits can be derived by their owners by holding or using

them (SNA 2008 paragraph 10.175, ESA 2010 Annex 7.1). For land it is important to note that this includes allowing others to use the land.

Clarifications definitions and borderline cases

2.11. As mentioned in paragraph 2.10 associated surface water is included in the definition of land. Associated surface water covers territorial waters and any inland waters (reservoirs, lakes, rivers, etc.) over which ownership rights can be exercised and that can, therefore, be the subject of transactions between institutional units.

2.12. However, water bodies from which water is regularly extracted, against payment, for use in production (including for irrigation) are not included in the definition of land. They form part of the asset water resources (AN.214). Furthermore, the value of land excludes cultivated crops, trees and animals (AN.115), mineral and energy reserves (AN.212) — sometimes referred to as subsoil assets — and non-cultivated biological resources (AN.213). These resources should also be registered as separate assets.

2.13. Even more important from a quantitative point of view, the value of land should exclude any buildings or other structures (AN.111, AN.1121 and AN.1122) that are situated on the land or physically connected to the land. Although they are often purchased or sold together with the land on which they are situated (i.e. without separate valuations being placed on the structures and the land) an effort should be done to separate the value of the buildings and other structures from the value of the underlying land.

2.14. In case that it is not possible to separate the land from the related assets (buildings and other structures, water resources, mineral and energy resources, cultivated and non-cultivated biological resources), SNA 2008 and ESA 2010 recommend to register the combined value under the more valuable asset (SNA 2008 paragraph 13.46, ESA 2010 paragraph 7.52). However, in this compilation guide it is advised to make a serious effort to produce estimates for the separate components. Separate estimates, even if they are rough, are clearly to be preferred above registration of the combined value under the more valuable asset. Chapter 6 will provide guidance regarding the question of how structures and the underlying land can be separated.

2.15. Land can be improved in many different ways. Land clearance and the creation of wells could be examples of land improvements (AN.1123). Land improvements should be considered as separate (fixed) assets and therefore should be excluded from the determination of land value. In Chapter 8.2 the issue of land improvements will be elaborated more extensively.

2.16. When land is purchased or sold, often costs have to be paid for the ownership transfer. The costs of ownership transfer are recorded as gross fixed capital formation (GFCF) and are, therefore, considered a produced asset that should be excluded from the asset land itself. Instead, by convention, the costs of ownership transfer should be registered as part of the fixed asset land improvements. This is in contrast to the value of natural resources other than land on the balance sheet. While the costs of ownership transfer for other natural resources are also recorded as GFCF, the value of the natural resources other than land includes these costs on the balance sheet. This is due to the fact that the costs of ownership transfer on non-produced assets other than land cannot be easily integrated with the value of another produced asset (as in the case for land).

2.17. Costs of ownership transfer are also paid when dwellings and other building and structures are purchased or sold. If these transfer costs are based on the total property value (the combined value of the structure and the underlying land) then in theory these costs of ownership transfer should be split into costs of ownership transfer on the produced asset (e.g. dwelling) and the non-produced asset (e.g. land). If it is not possible to separate the costs of ownership transfer it is recommended to register the combined value of the costs of ownership transfer under the more valuable asset (i.e. costs of ownership transfer related to the structure or costs of ownership transfer related to the land).

Disaggregation of land and definition of components

2.18. The SNA 2008 does not specify a disaggregation of land. In Chapter 23 of the ESA 2010 land is broken down into land underlying buildings and structures (AN.2111), land under cultivation (AN.2112), recreational land and associated surface water (AN.2113) and other land and associated surface water (AN.2119), but no definitions of these components are provided. However, a breakdown of the asset land and clear definitions of its components are considered to be very useful. On the one hand users could be interested in more specified data on land. On the other hand, the distinction of components could be helpful in estimating the total value of land.

2.19. The components of land, the definitions of the components and the rationale behind the breakdown of land are comprehensively discussed in Chapter 3.

Conceptual issues

Ownership and economic benefits from land

2.20. In general the SNA 2008 (SNA 2008 paragraphs 1.48, 2.19, 4.10) and ESA 2010 (ESA 2010 paragraph 2.07) require that a unit should be engaged in economic activities and transactions on a significant scale for at least more than a year at a certain location within the economic territory of a country in order to recognise that location as a ‘centre of economic interest’. However, the ownership of land (and buildings) within the economic territory is deemed to be sufficient for the owner to have a centre of predominant economic interest there.

2.21. The definition of land mentions the enforcement of ownership rights as an important characteristic of land as an asset (SNA 2008 paragraph 10.175, ESA 2010 Annex 7.1). From the definition it can be concluded that land can only be considered as an asset if there exists an institutional unit that exercises effective ownership rights over the land. If this is the case, the institutional units are usually — but not always — in the position to derive economic benefits from the land and the land is considered to fall within the asset boundary and has to appear on the balance sheet of that unit. Institutional units can be non-financial or financial corporations, government, households and non-profit institutions serving households. It seems reasonable to assume that all land within the borders of a country is owned by one of these institutional units. Even where ownership cannot be clearly identified, the government could be considered as the legal owner of the land.

2.22. It is very well possible that a foreign institutional unit owns a piece of land in the national territory. In case land located in a territory is owned by a non-resident entity, for national accounts purposes an artificial unit is created. This so called notional resident unit is considered as being the resident owner of the land. The notional unit is a quasi-corporation and should be included in the non-financial corporations’ sector. The non-resident owns the notional resident unit, rather than owning the land directly. So there is an equity liability of the resident notional unit to the non-resident, but the land itself is always an asset of the economy in which it is located.

2.23. However, there is one exception to the principle that land is always an asset of the economy in which it is located. This exception concerns land (and buildings) in extraterritorial enclaves of foreign governments (such as land underlying embassies, consulates and military bases) that are subject to the laws of the home territory and not those of the territory where they are physically situated. Therefore, the land in extraterritorial enclaves should be registered on

the balance sheet of (the government of) the home country instead of the country where the land is located.

2.24. From the above it can be concluded that in case of a purchase, both the purchaser and seller of land are residents by definition. From that it follows that, for the economy as a whole, the aggregate value of total purchases of land must equal the aggregate value of total sales. The value of acquisitions less disposals of land is thus zero for the economy as a whole, excluding transactions that change the boundary of the economic territory itself. Of course, separate institutional sectors or subsectors usually will have a value of acquisitions less disposals of land that differs from zero.

2.25. Another criterion mentioned in the definition of land — and in the definition of an asset in general — is the need to derive economic benefits from it. Contrary to the criterion of ownership, in some cases it will be difficult to determine whether or not this criterion is fulfilled. One example where it might be difficult to derive economic benefits from the land could be remote land, inaccessible deserts or tundras. It might not be possible to derive any economic benefits from these types of land given the technology existing at the time, in which case they should not be registered on the balance sheet.

Ownership related to the lease of land and public-private partnerships

2.26. The SNA 2008 and ESA 2010 distinguish three types of lease: operating lease, financial lease and resource lease (SNA 2008 paragraph 17.300, ESA 2010 paragraph 15.04). In case of land, usually the resource type of lease applies. A resource lease is one where the owner of a natural resource makes it available to a lessee in return for a payment recorded as rent. In a resource lease the resource asset — for example, the land — remains on the balance sheet of the lessor even though it is used by the lessee. An exception, when a long-term lease of land may be taken as the sale of the land, is described below.

2.27. A resource lease on land may be considered as a sale of the land if the lease satisfies certain criteria. These criteria include: (a) costs and benefits assumed by the lessee, (b) upfront payment or instalment made by the lessee, (c) substantial length of the lease contract, (d) cancellation and transferability possibilities: lessor cannot easily cancel the contract or transfer it to another lessee. The assessment of these criteria may lead to the conclusion that a sale of the land has to be registered. After the sale, the land will appear on the balance sheet of the lessee.

2.28. In some jurisdictions, the land under buildings remains in the legal ownership of a landlord other than the owner of the buildings. If regular payments are made to the

landlord, these are recorded as rent. However, it is sometimes the case that, even though the land legally belongs to another unit, the right to occupy it for an extended period is paid for in a single upfront payment often when the building is acquired. As explained in the previous paragraph, this suggests recording the payment as the acquisition of the asset. In such a case, when the building changes ownership, the purchase price includes an element representing the present value of future rent payments on the land. In such a case, the land is recorded as if the ownership is transferred along with the building above the land. If, at the end of the land lease, a further payment is liable for extension of the lease for another long-term period, this should be recorded as capital formation and an acquisition of an asset in a manner similar to costs of ownership transfer on purchase and sale of an asset.

2.29. Public-private partnerships (PPPs) are complex, long-term contracts between two units, one of which is normally a corporation (or a group of corporations, private or public) called the operator or partner, and the other normally a government unit called the grantor. At the end of the contract, the grantor usually acquires legal ownership of the fixed assets. A general description that includes the most common accounting problems is as follows: a corporation agrees to acquire a complex of fixed assets and then to use those assets together with other production inputs to produce services. Those services may be delivered to government, either for use as an input to its own production or for distribution to the public without payment such as education services, in which case government makes periodic payments during the contract period and the corporation expects to recover its costs and earn an adequate rate of return on its investment from those payments. More details about PPPs can be found in SNA 2008 paragraphs 22.154–22.163 and ESA 2010 paragraphs 20.276–20.302.

2.30. As with leases, the economic owner of the assets in a PPP is determined by assessing which unit bears the majority of the risks and which unit is expected to receive a majority of the rewards of the assets. The provisions of each PPP contract shall be evaluated in order to decide which unit is the economic owner. The assets (that also could include land) will after assessment be allocated to the economic owner and has to be registered on his balance sheet.

Land in the system of national accounts

2.31. The primary goal of this compilation guide is to provide guidance on the compilation of estimates for the stock of land. However, it is important to realise that there is a close mutual coherence between the stock of land and the changes in the stock through transactions and other changes. That is, the value of land at a certain point in time

is expressed in the balance sheet but the changes in the value are visible in the flow accounts: either as transactions or as other changes. The mutual coherence between balance sheets, transactions and other changes will be elaborated in the paragraphs below.

2.32. The overview below presents a picture of the relationships between stocks and flows in general (ESA 2010 paragraph 7.12).

Table 2.2: Relationships between stocks and flows

The value of the stock of a specific type of asset in the opening balance sheet		
plus	transactions	the total value of that asset acquired in transactions that take place during the accounting period
minus		the total value of that asset disposed of in transactions that take place during the accounting period
minus		consumption of fixed capital (if applicable)
plus	other changes in the volume of assets	other positive changes in volume affecting that asset
minus		other negative changes in volume affecting that asset
plus	revaluations	the value of nominal holding gains accruing during the period resulting from changes in the price of that asset
minus		the value of nominal holding losses accruing during the period resulting from changes in the price of that asset
equals the value of the stock of that asset in the closing balance sheet.		

Source: ESA 2010

Note that since land does not depreciate the consumption of fixed capital equals zero in the case of land.

2.33. The accounting links for the asset land between the opening balance sheet and the closing balance sheet via transactions, other changes in the volume of assets, and holding gains and losses are shown below (ESA 2010 Annex 7.2).

Table 2.3: Accounting links between opening and closing balance sheet for land

Classification of assets, liabilities and net worth	IV.1 Opening balance sheet	III.1 and III.2 Transactions	III.3.1 Other changes in volume	III.3.2 Holding gains and losses		IV.3 Closing balance sheet
				III.3.2.1 Neutral holding gains and losses	III.3.2.2 Real holding gains and losses	
Land	AN.211	NP.1	K.1, K.22, K.3, K.4, K.5, K.61, K.62	K.71	K.72	AN.211

Source: ESA 2010, Annex 7.2

Stocks

2.34. The balance sheet completes the sequence of accounts. It shows the ultimate effect of the entries in the production, distribution and use of income, and accumulation accounts (SNA 2008 paragraph 13.5, ESA 2010 paragraph 7.03).

2.35. The item land (AN.211) on the opening balance sheet (IV.1) and closing balance sheet (IV.3) relates to the value of this asset at a particular moment of time: the beginning and end of an accounting period. The accounting period can be any period, but usually is a year or a quarter. The closing balance sheet at the end of the period should be equal to the opening balance sheet at the beginning of the next period.

2.36. The stock of land can be determined for the total national economy and the resident institutional sectors.

The institutional sectors are non-financial corporations, financial corporations, general government, households and non-profit institutions serving households (SNA 2008 paragraph 4.24); most of them can be broken down into subsectors. The asset land does not appear on the balance sheet of the rest of the world towards the national economy.

2.37. Although from a conceptual point of view assets can only be owned by institutional units, for some purposes, like productivity analysis, it can be useful to break down assets — and also land — by industry as well. In the United Nations' International Standard Industrial Classification of All Economic Activities (ISIC Rev. 4) and its European equivalent Nomenclature générale des Activités économiques dans les Communautés Européennes — Statistical classification of economic activities in the European

Communities (NACE Rev.2) a standardised breakdown into industries can be found.

2.38. Given land's important role in both sectoral and national wealth, this guide is primarily concerned with the measurement of the stock of land.

Transactions

2.39. Transactions in land should be registered under acquisition less disposals of natural resources (NP.1) (SNA 2008 paragraph 10.174 and Table 10.4, ESA 2010 paragraphs 3.185–3.186). Acquisitions less disposals of non-produced assets are recorded in the capital account of the sectors. At the total economy level, these transactions net to zero, as inter-sectoral purchases and sales cancel each other out. Transactions in land take place when an institutional unit buys or sells land to another institutional unit.

2.40. As discussed in paragraph 2.22, land is always an asset of the economy in which it is located. Thus, all purchases and sales of land normally take place between resident units. The one exception is when the boundaries of the economic territory itself are changed, for example, when a foreign government, or international organisation, purchases or sells land that is added to, or taken away from, the enclave in which its embassy or offices are located.

2.41. Purchases and sales of land should be recorded excluding costs of ownership transfer for both buyers and sellers. The costs of ownership transfers should by convention be registered under transactions in land improvements that form part of GFCF (P.51g).

2.42. Land improvements such as land clearance and creation of wells and watering holes are separate assets that should be registered under AN.112 other buildings and structures. As a consequence transactions in land improvements should not be registered as acquisition less disposals of natural resources (NP.1), as is the case for land, but as GFCF.

2.43. Consumption of fixed capital (P.51c) is defined as the decline in value of fixed assets owned, as a result of normal wear and tear and obsolescence (SNA 2008 paragraph 10.25, ESA 2010 paragraph 3.139). As land is not a fixed asset and as land is not subject to obsolescence, no consumption of fixed capital should be calculated and registered for land.

2.44. Transactions in land can be significant, especially for certain types of land as well as for certain institutional sectors. However, they can also be difficult to observe and therefore challenging to measure due to the paucity of data sources. To the extent that inter-sectoral land transactions are excluded from the sector capital accounts, net lending/borrowing is misstated; and, the case of integrated capital

and financial accounts sector statistical discrepancies are also exacerbated.

2.45. It is useful for compilers to consider the types of common transactions that should appear in the capital account in their respective economies. This is a first step towards identifying new or improved data sources. It is important to note that not all of these sources will necessarily be coherent in terms of definitions and valuation, but they should be assessed for their relative strengths and weaknesses as part of a process to generate measurement strategies and methodologies. Some key types of common land transactions are considered below.

2.46. Governments can sell public land under their custodianship for agricultural or other developmental uses to the private sector. Government data sources may well have such details under the general heading of 'disposals of assets' with appropriate values. Agricultural censuses may have estimates of new farmland entering in production, either in values or volumes or both.

2.47. Farmland can be sold by unincorporated or incorporated enterprises to developers to accommodate new residential or non-residential construction. In this case, some information may be found in agricultural census-surveys on farmland sold. Alternatively, there may be administrative data by regions where changes in land use are recorded that can be leveraged. In addition, developers themselves should have acquisition costs (though possibly inclusive of costs of ownership transfer) associated with their land inputs.

2.48. A significant transaction in land in many economies relates to residential development. This is the case where new housing is sold and the underlying land ownership moves from the developers (typically corporate sector) to the new owners (typically individuals, though some residential development is sold to other corporations for rental purposes). Given that residential real estate acquisitions are big ticket purchases for households and are typically associated with other transactions such as loans to finance the investment, it is important to strive to estimate in the capital account not only the structures acquired/sold (produced asset) but also the underlying land (non-produced asset) in these real estate transactions. Real estate developers typically compile information on new construction in progress and change in inventory, and they may also compile sales of dwellings including and excluding land — with the difference being an acceptable estimate for land sold in a period. If this detail is available then the remaining issue will be to determine how much of the new real estate changes sectors in sales to households and what proportion of the underlying land is transferred with those sales (given that land proportions (i.e. land as a share of the total real estate value) are different on individual dwellings versus large rental units).

2.49. Land can also be transacted among large corporations. In many cases these transactions are intra-sectoral within the non-financial corporations' sector (e.g. the case of real estate developers selling units to real estate renters), and therefore net to zero. In a smaller number of cases, the transactions can be inter-sectoral and knowledge of the market may be sufficient to generate some adequate estimates. Lastly, land can be transferred among corporations as part of mergers and acquisitions activity, but direct transactions in land typically do not need to be recorded in these cases.

Other flows

2.50. Other changes are economic flows, other than those that occur through transactions recorded in the capital and financial accounts that change the value of assets and liabilities (ESA 2010 paragraph 6.02).

2.51. Two types of other changes are distinguished. The first consists of other changes in the volume of assets (III.3.1). The second is through nominal holding gains and losses (III.3.2) (ESA 2010 paragraph 6.02).

2.52. Concerning the first one: other changes in the volume of assets include flows that allow assets to enter or leave the accounts other than by transactions — for example, entrances and exits due to the discovery, depletion and degradation of natural assets. Other changes in the volume of assets also include the effect of exceptional, unanticipated external events that are not economic in nature, and changes resulting from reclassification or restructuring of institutional units or assets and liabilities.

2.53. Concerning the second one, nominal holding gains and losses: the nominal holding gains and losses (K.7) that relate to an asset are the increases or decreases in the asset's value accruing to its economic owner as a result of increases or decreases in its price.

Other changes in the volume of assets and liabilities

2.54. As can be concluded from Table 2.3, there are seven types of other changes in volume that are relevant for the asset land. They are economic appearance of assets (K.1), other economic disappearance of non-produced assets (K.22), catastrophic losses (K.3), uncompensated seizures (K.4), other changes in volume n.e.c. (K.5), changes in sector classification and structure (K.61) and changes in classification of assets and liabilities (K.62).

2.55. Economic appearance of assets (K.1) is the increase in the volume of produced and non-produced assets that is not the result of production (SNA 2008 paragraphs 12.12–12.44, ESA 2010 paragraph 6.06). It includes (a) transfers of other natural resources to economic activity and (b) quality changes in natural assets due to changes in economic uses.

2.56. An example of a transfer of natural resources to economic activity could be the transfer of land from a wild or waste state to land that can be put to economic use. The natural resources may also acquire value due to economic activity in the vicinity, for example, land may be recognised as valuable because of a nearby development or creation of an access road. The cost of land improvements is recorded as GFCF but any excess in the increase of value of the land over the value of the land improvements is recorded as economic appearance.

2.57. Concerning quality changes in natural assets due to changes in economic uses: these changes have to be recorded here as the counterpart of the changes in economic use that are shown as changes in classification. For example, the reclassification of cultivated land to land underlying buildings and structures may result in an increase in value as well as a change in classification. In this case the asset is already within the asset boundary and it is the change in quality of the asset due to the change of economic use that is regarded as the appearance of an asset. (See paragraph 2A.9 in annex to this chapter.)

2.58. Economic disappearance of assets (K.2) concerns the exit of natural resources from the asset boundary (SNA 2008 paragraphs 12.12–12.44, ESA 2010 paragraph 6.07). K.21 depletion of natural resources does not apply to land, but K.22 other economic disappearance of non-produced asset could be relevant. Many of the possible entries are simply the negative alternative to the positive entries just discussed in paragraphs 2.55–2.57.

2.59. Catastrophic losses (K.3) recorded as other changes in volume result from large-scale, discrete and recognisable events that destroy economic assets (SNA 2008 paragraphs 12.46–12.47, ESA 2010 paragraphs 6.08–6.09). Such events include major earthquakes, volcanic eruptions, tidal waves, exceptionally severe hurricanes, drought and other natural disasters; acts of war, riots and other political events; and technological accidents such as major toxic spills or release of radioactive particles into the air. Examples of such events for land could be deterioration in the quality of land caused by abnormal flooding or wind damage.

2.60. Uncompensated seizures (K.4) occur when governments or other institutional units take possession of the assets of other institutional units, including non-resident units, without full compensation, for reasons other than the payment of taxes, fines or similar levies. The seizure of property related to criminal activity is considered to be a fine. The uncompensated part of such unilateral seizures is recorded as other changes in volume (SNA 2008 paragraphs 12.48–12.49, ESA 2010 paragraphs 6.10–6.11). An example applying to land could be the seizure of a piece of land by the government that previously belonged to a household, without providing compensation for this to the household.

2.61. Other changes in volume not elsewhere classified (K.5) are the effects of unexpected events on the economic value of assets (SNA 2008 paragraphs 12.50–12.62, ESA 2010 paragraphs 6.12–6.15). For example, this might concern a decline in the value of land as result of unforeseen effects of acidity in air or rain.

2.62. Reclassifying an institutional unit from one sector to another (K.61) transfers its entire balance sheet, e.g. if an institutional unit classified in the households sector becomes financially distinct from its owner, it may qualify as a quasi-corporation and be reclassified in the non-financial corporations' sector (SNA 2008 paragraphs 12.64–12.67, ESA 2010 paragraphs 6.17–6.20). For instance, if an unincorporated owner of a large farm changes into an incorporated unit, the land of the farm (and all other assets and liabilities) should be transferred from the households sector to the sector of the non-financial corporations. This transfer should be registered as K.61 on the other changes in volume of assets account.

2.63. Changes in classification of assets and liabilities (K.62) occur where assets and liabilities appear under one classification, such as land under cultivation, in the opening balance sheet and under another classification, such as land underlying dwellings, in the closing balance sheet (SNA 2008 paragraphs 12.68–12.71, ESA 2010 paragraphs 6.21–6.25). In the case of land, both entries (a negative entry for the old category, a positive one for the new category) are made with the same value. For example, unit A sells farm land to unit B, which uses it to build houses on. If A acquires a building permit before selling the land it should be registered as a change in classification in A's accounts (with a probable gain in value to be recorded as another volume change also in A's accounts), and then a sale of building land to B. If B acquires the building permit after the sale is complete, then it is farm land that is sold and B records a change of classification (and possibly another volume change) in its books.

Nominal holding gains and losses

2.64. The nominal holding gains and losses (K.7) that relate to an asset are the increases or decreases in the asset's value accruing to its economic owner as a result of increases or decreases in its price (ESA 2010 paragraph 6.27). In the SNA 2008 the nominal holding gain on a non-financial asset is the value of the benefit accruing to the owner of that asset as a result of a change in its price over a period of time (SNA 2008 paragraph 12.74). As the prices of land often change over time, this type of other changes will occur frequently and could be an important explanation for the changes between opening and closing balance positions of land. The holding gain or loss in the value of land will be unrealised as long as the land is owned by the same entity

between opening and closing balance sheets. The holding gain or loss in the value of land will be realised when the land is sold.

2.65. Nominal holding gains and losses (K.7) comprise neutral holding gains and losses (K.71) and real holding gains and losses (K.72).

2.66. The neutral holding gains and losses (K.71) relate to assets and liabilities and are the value of the holding gains and losses that accrue if the price of the asset or liability changes over time in the same proportion as the general price level (ESA 2010 paragraph 6.37). The SNA 2008 defines a neutral holding gain (loss) over a period as the increase (decrease) in the value of an asset that would be required, in the absence of transactions and other changes in the volume of assets, to maintain command over the same amount of goods and services as at the beginning of the period (SNA 2008 paragraph 12.75). Neutral holding gains and losses are identified to facilitate the derivation of real holding gains and losses, which redistribute real purchasing power between sectors. The general price index to be applied for the calculation of neutral holding gains and losses is a price index for final expenditure.

2.67. The real holding gains and losses (K.72) relate to an asset or liability and are the difference between the nominal and the neutral holding gains and losses on that asset (ESA 2010 paragraph 6.42). According to the SNA 2008 a real holding gain (loss) is the amount by which the value of an asset increases (decreases) over the neutral holding gain for the period, in the absence of transactions and other changes in the volume of assets (SNA 2008 paragraph 12.76).

Valuation

Stocks of land

2.68. On the balance sheet land should be valued at its current market price (SNA 2008 paragraph 13.16, ESA 2010 paragraph 7.33), which is the value of the land as if it were being acquired on the date to which the balance sheet relates. Any expenditure on land improvements is recorded as GFCF and the additional value it provides is excluded from the value of land shown in the balance sheet and is instead shown in a separate asset category for land improvements (AN.1123).

2.69. When market prices for transactions are not observable, valuation according to market-price-equivalents provides an approximation to market prices. For example, if the market price of a certain piece of land is not available, prices of land with a comparable use and location could be used. Alternatively, the acquisition costs of the land could be used as a starting point that subsequently should be

adjusted for revaluations and other changes in the volume of assets. If none of the methods mentioned above can be applied, stocks may be recorded at the discounted present value of expected future returns.

Flows

2.70. The SNA 2008 and ESA 2010 prescribe to value transactions at market prices (SNA 2008 paragraph 3.119, ESA 2010 paragraph 1.94). Market prices for transactions are defined as amounts of money that willing buyers pay to acquire something from willing sellers; the exchanges are made between independent parties and on the basis of commercial considerations only, sometimes called ‘at arm’s length’.

2.71. Acquisitions and disposals of land (and other natural resources) are valued at current market prices prevailing at the time the acquisitions/disposals occur. Transactions in land are recorded at the same value in the accounts of the purchaser and in those of the seller. This value excludes the costs of ownership transfer of the natural resource. These costs are treated as GFCF.

2.72. In order to determine the valuation of the other changes in the volume of assets, it is usually necessary to value the asset before and after the change in volume and take the difference that is not explained by any transaction as the value of the other changes in the volume of assets (SNA 2008 paragraph 3.151).

2.73. Holding gains and losses usually accrue continuously to land. In general, they are estimated by deducting from the total change in the value of assets those that can be attributed to transactions and to other changes in volumes (SNA 2008 paragraph 3.153).

2.74. However, the estimation of the components of the flows (transactions, other changes in the volume of assets, holding gains and losses) heavily depends on the available sources. For instance, if information on the price developments of land is available, it might be possible to estimate the holding gains and losses autonomously and derive one of the other flow components as a residual.

Time of recording

2.75. When discussing timing in the SNA 2008 and ESA 2010, an essential distinction should be made between stock data as recorded in balance sheets, on one hand, and flow data as recorded in the accounts, on the other. Balance sheets, by definition, refer to specific points in time. In contrast, flows are aggregations, over some chosen accounting period, of individual transactions or other flows, which are themselves scattered over the accounting period.

Stocks

2.76. Balance sheets can be drawn up for any point in time. The SNA 2008 and ESA 2010 define balance sheets for all sectors at the moment when one accounting period ends and a new accounting period begins. The closing balance sheet of one period is identical to the opening balance sheet of the next one, so there remain no price changes, reclassifications or other economic flows that are not duly recognised by the SNA 2008 and ESA 2010 (SNA 2008 paragraph 3.189, ESA 2010 paragraph 7.11).

Flows

2.77. Cash accounting cannot be used generally for economic and national accounting as the times at which payments take place may diverge significantly from the economic activities and transactions to which they relate and it is these underlying activities and transactions that the SNA 2008 and ESA 2010 seek to portray. Therefore the general principle regarding the time of recording of transactions is accrual accounting (SNA 2008 paragraph 3.166, ESA 2010 paragraph 1.101).

2.78. Accrual accounting records flows at the time economic value is created, transformed, exchanged, transferred or extinguished. This means that flows that imply a change of ownership are entered when the change occurs, services are recorded when provided, output at the time products are created and intermediate consumption when materials and supplies are being used.

2.79. Applying the accrual principle to the acquisition less disposals of natural resources (NP.1) (that includes the transactions in land) implies that the purchase or sale of land should be registered at the moment when the economic ownership of the land changes hands. When a change in ownership is not obvious, the change can be considered to occur at (or proxied by) the time the parties to the transaction record it in their books or accounts and, failing that, the moment when physical possession and control is acquired.

2.80. Other changes in the volume of assets are usually discrete events that accrue at precise moments or within fairly short periods of time (SNA 2008 paragraph 3.182).

2.81. Changes in structure and classification should be entered at the moment when a unit or an asset is moved to a different category than that to which it was classified previously. An integrated stock-flow system requires that all reclassifications are recorded and all entries for the reclassification are recorded at the same time (SNA 2008 paragraph 3.185).

2.82. Changes in prices often have a more continuous character, particularly in respect of assets for which active markets exist. In practice, nominal holding gains or losses

will be computed between the beginning of the accounting period or the point in time when ownership of the land is acquired, and the end of the accounting period or the point in time that the land is disposed of (SNA 2008 paragraph 3.183).

Netting and consolidation

2.83. Net recording concerns a registration whereby the values of some elementary items are offset against items on the other side of the account (for example asset against corresponding liability) or which have an opposite sign (SNA 2008 paragraph 3.193, ESA 2010 paragraph 1.110). With respect to stocks of land: as land can only appear on the asset side of the balance sheet and as the value is always positive, stocks of land cannot be netted. With respect to transactions in land: these are netted by definition as the transactions are defined as acquisitions (or purchases) less disposals (or sales) of non-financial assets.

2.84. Consolidation is a method of presenting the accounts for a set of units as if they constituted one single entity (unit, sector, or subsector). It involves eliminating transactions and reciprocal stock positions and associated other economic flows among the units being consolidated

(SNA 2008 paragraph 3.197, ESA 2010 paragraph 1.106). As land is a non-financial asset without a counterpart liability consolidation is not applicable to stocks of land.

Data issues in the measurement of flows of land

2.85. As noted above, the measurement of land transactions is typically a challenging undertaking for compilers due to lack of data sources. Further, in many instances of inter-sectoral land transactions, the asset is created beforehand or at the same time; and, the asset can also change value and/or use (that is, type) at or near the time of transaction. However, compilers may find that the transactions, the revaluation changes, or the other changes in volume are difficult to estimate and/or separate. As a result, some or all of these components may represent either data gaps or data series of lower quality.

2.86. In addition, a further issue relates to the appropriate classification of the transactions in land by type in the simultaneous sale (one type of land) and purchase (another type of land). As a result, land transactions are not commonly generated by type of land in national accounts' estimates. Rather, the availability of estimates of land classified by type is more typical of balance sheet data.

Annex: Distinguishing other changes in volume from holding gains and losses

Introduction

2A.1. The primary goal of this compilation guide is to provide guidance when compiling estimates of the stocks of land in a country. However, as described in Chapter 2, there is coherence between the stocks of land and the changes in stocks of land. The change in value between balance sheets is the result of transactions, other changes in volume, or revaluations (due to changes in price). While other chapters discuss the issues of how to value the stock of land on the balance sheet this annex focuses on how changes in the value of land between opening and closing balance sheets, that are not the result of transactions can be deconstructed into changes in price and changes in volume.

2A.2. There are several reasons why valuing the stocks of land is difficult in practice and much of this compilation guide discusses those reasons, such as the difficulty in separating the value of the land from the value of the structure upon the land. Even when there are separately identifiable land values derived from transactions without buildings, such as agricultural land, it is hard to argue that these unit prices should be used as a proxy for the price of land underlying dwellings. If this were done, the value of the urban land would be undervalued because most transactions in land without buildings would occur in rural areas or on the outskirts of cities where prices are usually much lower than in developed urban areas.

2A.3. Therefore, it is not only important to know the size of the land area (i.e. number of square metres) but also the location and the use of a specific piece or tract of land (i.e. the quality characteristics) and to price it accordingly. Because different qualities reflect different use values this guide, which will be discussed in Chapter 3, recommends classifying land by type/use. Without the necessary subcategories of land it would be difficult to allocate changes in quality (the use of land) as changes in volume.

Description of the issue

2A.4. Differentiating between non-transaction related value changes driven by price 'revaluation' and changes driven by 'other changes in volume' (quantity/quality) may be difficult to implement in practice. Not all land included in the geographic surface area of a country is necessarily within the asset boundary of the SNA 2008/ESA 2010. Land may make its economic appearance when it is transferred from a wild or waste state to one in which ownership may be established and the land can be put to economic use (see

SNA 2008 paragraph 12.21). In such cases, the national accountants may be able to observe an increase in the quantity of land (number of square metres) of the economy as a whole and be able to record such an increase as a change in volume.

2A.5. In cases where the total quantity of land within the asset boundary remains the same for the economy as a whole it may be more difficult to identify the changes in the use of land if all that is observed is a change in value. In this instance, one might attribute a change in value solely to changes in price. As was stated previously, this is why detailed classifications should be used so that national accountants are better equipped to identify changes in the value of land as change in volume.

Conceptual issues in identifying quality changes

2A.6. This section discusses some of the conceptual issues that arise when trying to differentiate between value changes driven by revaluation and those driven by other changes in volume. A basic principle of the SNA 2008 is that different use values are reflected as differences in quality. Therefore changes in economic use of land that lead to a change in classification should be recorded as a change in volume and any excess in the value due to the change in classification should be recorded as an economic appearance of an asset.

2A.7. The following passage from the ESA 2010 describes the various scenarios of what can be considered as an economic appearance of an asset:

'Economic appearance of assets is the increase in the volume of produced and non-produced assets that is not the result of production. Included are...'

Quality changes in natural assets due to changes in economic uses. Changes in quality are recorded as changes in volume. The quality changes recorded here occur as the counterpart of the changes in economic use that are shown as changes in classification (see paragraph 6.21). For example, the reclassification of cultivated land to land underlying buildings may result in an increase in value as well as a change in classification. In this case the asset is already within the asset boundary and it is the change in quality of the asset due to the change of economic use that is regarded as the appearance of an asset' (ESA 2010 6.06f).

2A.8. In addition, there are relevant passages from the SNA 2008 as well.

12.23 The SNA 2008, in general, treats differences in quality as differences in volume. As explained with respect to goods and services in Chapter 15, different qualities reflect different use values (and in the case of goods and services, different resource costs). Different qualities are, therefore, economically different from each other. The same principle applies to assets. The quality changes recorded here occur as the simultaneous counterparts of the changes in economic use that are shown as changes in classification, as described below. For example, the reclassification of cultivated land to land underlying buildings may result in a change of value as well as a change in classification. In this case, the asset is already within the asset boundary, and it is the change in quality of the asset due to changes in its economic use that is regarded as the appearance of additional amounts of the asset. Another example is that of livestock treated as capital formation, for example, dairy cattle, if they are sent to slaughter earlier than expected.

12.29 The changes recorded here are the negative equivalent of the upward changes in volume associated with the changes in classification. For example, if a change in land use leads to reclassifying some land from cultivated land to communal grazing land, there will may be a resulting change in the value of the land.

12.30 All degradation of land, water resources and other natural assets caused by economic activity is recorded in the

other changes in the volume of assets account. The degradation may be an anticipated result from regular economic activity or less predictable erosion and other damage to land from deforestation or improper agricultural practices.'

Change in use

2A.9. Table 2A.1 describes a common scenario where the use of the land has changed which leads to a change in classification. Suppose at the beginning of the time period 1 000 square kilometres of agricultural land valued at 20 per square kilometre are re-zoned for residential use valued at 100 per square kilometre. The changes in value of the land for each asset type should be recorded as other changes in volume. However, there are several entries that occur. The change in classification from agricultural to residential use should be recorded as changes in classification of assets and liabilities (K.62). The change in classification (K.62) is an offsetting adjustment in that agricultural land shows a negative value of -20 000 (1 000 * 20) and land underlying dwellings shows a positive value of 20 000. Because the price of the agricultural land is lower than the price of the land underlying dwellings the total value of the land increased, this excess value (80 000) should be recorded as an economic appearance of assets (K.1).

Table 2A.1: Change in use of land from agricultural land to land underlying buildings and structures

	Opening balance sheet			Closing balance sheet			Revaluation	Other changes in volume	Notes
	Quantity	Unit price	Value	Quantity	Unit price	Value			
Land (AN.211)	1 000	20	20 000	1 000	100	100 000	0	80 000	
Land underlying buildings and structures				1 000	100	100 000	0	100 000	
Land underlying dwellings	0	100	0	1 000	100	100 000	0	100 000	
								80 000	Economic appearance of assets (K.1)
								20 000	Changes in classification of assets (K.62)
Land underlying other buildings and structures									
Land under cultivation	1 000	20	20 000	0	20	0	0	-20 000	
Agricultural land	1 000	20	20 000	0	20	0	0	-20 000	
								-20 000	Changes in classification of assets (K.62)
Forestry land									
Surface waters used for aquaculture									
Recreational land and associated surface water									
Other land									

Source: TF on Land and other non-financial assets, fictitious data

Apparent 'quality' changes

2A.10. An example of changes in the apparent 'quality' of land that may be less clear to national accountants is when the value of a tract of land changes because the surrounding land now has another use. The market value of two identical buildings can be quite different depending on location and amenities such as being close to parks, highways, job opportunities, etc.

2A.11. Table 2A.2 illustrates a scenario where a park is rezoned and is therefore reclassified as land on which dwellings can be built. Under such a scenario, the value of the residential properties — that is the value of the dwelling including the land — overlooking the park land is likely to decrease. There is an increase in the value of the reclassified park land because land underlying dwellings generally have a higher price. It is fairly clear according to the SNA 2008 that the reclassified park land is a change in use and represents a change in quality. What might be less clear is how to record the change in value of the tract of land that is not reclassified.

2A.12. After consulting the Advisory Expert Group (AEG) on national accounts, from a purely conceptual point of view the change in the value of land that is due to changes in the surrounding amenities of the land are to be recorded as other changes in volume. Essentially the value of land is not only determined by the economic use, location, and size but also by surrounding amenities (such as parks, high quality schools, and access to public transportation, etc.) and these surrounding amenities should be considered as quality-characteristics. The argument is that any increase/decrease in value of the land as a consequence of activities in the vicinity should be recorded as economic appearance of assets /economic disappearance of non-produced assets. This is in accordance with SNA 2008 paragraph 12.21 that states:

'Not all land included in the geographic surface area of a country is necessarily within the asset boundary of the SNA 2008... It may also acquire value because of activity in the vicinity, for example, land that becomes more desirable and thus more valuable because of a new development is established nearby or the creation of an access road.'

Table 2A.2: Reclassification of surrounding land for another use

	Opening balance sheet			Closing balance sheet			Revaluation	Other changes in volume	Notes
	Quantity	Unit price	Value	Quantity	Unit price	Value			
Land (AN.211)	2 000	70	140 000	2 000	80	160 000	0	20 000	
Land underlying buildings and structures	1 000	100	100 000	2 000	80	160 000	0	60 000	
Land underlying dwellings	1 000	100	100 000	2 000	80	160 000	0	60 000	
Existing dwellings near park	1 000	100	100 000	1 000	80	80 000	0	-20 000	Other economic disappearance of non-produced assets (K.22)
Park land reclassified for residential use				1 000	80	80 000		80 000	
								40 000	Economic appearance of assets (K.1)
								40 000	Changes in classification of assets (K.62)
Land under cultivation									
Agricultural land									
Forestry land									
Surface waters used for aquaculture									
Recreational land and associated surface water	1 000	40	40 000	0	40	0		-40 000	
Park land	1 000	40	40 000	0	40	0		-40 000	Changes in classification of assets (K.62)
Other land									

Source: TF on Land and other non-financial assets, fictitious data

2A.13. Under perfect competition and transparent markets, an argument can be made that price relatives at a particular point in time reflect differences in volume (quantities or qualities). According to this line of reasoning, having a higher price because of attributes in the vicinity (view on a park, high quality school in the neighbourhood) actually reflect differences in quality. Taking this point one step further, one could argue that a decline in the value of the land underlying the dwelling, because of a nearby park being changed into a residential area (or worse), reflects a quality decrease.

2A.14. One can look at price and volume measurement theory and theory of discrete choice to understand this line of reasoning. In principle, the price components should include changes arising solely from price changes, while all other changes (relating to quantity and quality and compositional changes) should be included in the volume components ⁽⁶⁾. As a theoretical framework a ‘characteristics’ approach is used to deconstruct the observed price movement into a ‘pure’ price change and a change due to changes in characteristics. What is apparent when one thinks about constructing constant-quality prices is that (i) too many quality characteristics exist for quality-mix changes to be considered adequately covered by different classifications; (ii) any price index used to deflate values belonging to a particular classification must be tailored to transactions and changes in quality-mix characteristics within that classification; and (iii) while a detailed classification is analytically useful there are trade-offs because a too detailed classification will reduce the effective sample size ⁽⁷⁾.

2A.15. However, the AEG recognised the difficulty in identifying such a change in value in practice. As a result, the change in the value of land due to changes in the surrounding amenities will most likely be recorded as revaluations ⁽⁸⁾.

Borderline with land improvements

2A.16. Another example is that the quality of land may appear to change because there is some sort of improvement to the land, such as clearing land so that houses can be built on the land. This apparent ‘change’ in the quality of land should not be recorded as a volume change in the non-produced category of land but as land improvements that should be recorded as gross fixed capital formation. Chapter 8.2 discusses this issue in more detail and describes how land improvements can be separated from land.

Practical advice

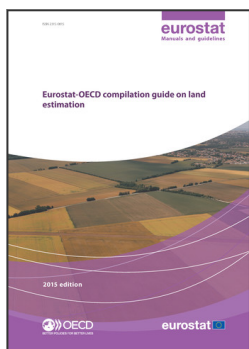
2A.17. In practice, it may be very difficult to make such a nuanced distinction between other changes in volume versus revaluation changes. The situation may be blurred, and it might not be possible to distinguish these different characteristics in land, as a consequence of which the relevant changes will most likely be recorded as revaluations.

2A.18. If detailed information does not exist to deconstruct changes in value between balance sheets within a particular classification then a national statistical institute can draw a boundary of what should be recorded as other changes in volume. One such practical solution could be to record as changes in volume only those tracts of land that change economic use (proxied as a change in classification). On the other hand, if incidental and exceptionally large changes in the value of land due to changes in the surrounding amenities can be identified by a country, then these changes in quality may be recorded as other changes in volume. However, in practice, this will most likely be rarely done.

⁽⁶⁾ Eurostat, *Handbook on price and volume measures in national accounts*. Available at <http://ec.europa.eu/eurostat/documents/3859598/5827257/KS-41-01-543-EN.PDF/10be98a9-083d-446a-a528-682c95914e9f?version=1.0>

⁽⁷⁾ Mick Silver is a specialist in price statistics at the International Monetary Fund and contributed to the discussion on price theory.

⁽⁸⁾ For the issue paper presented at the 9th Advisory Expert Group meeting 8–10 September 2014 as well as the conclusions of the meeting see <http://unstats.un.org/unsd/nationalaccount/aeg/2014/M9-2.asp>



From:
Eurostat-OECD Compilation guide on land estimations

Access the complete publication at:
<https://doi.org/10.1787/9789264235175-en>

Please cite this chapter as:

OECD/Eurostat (2015), “Concepts and definitions”, in *Eurostat-OECD Compilation guide on land estimations*, Eurostat, Luxembourg.

DOI: <https://doi.org/10.1787/9789264235175-3-en>

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