

Chapter 11: Capital account

(OLD Chapter 10: The capital account)

Please note that the order of this chapter in the 2008 SNA has been changed, mainly because of the revised classification of non-financial assets, from distinguishing between produced and non-produced non-financial assets to having a breakdown into (i) produced non-financial assets (excluding natural capital); (ii) non-produced non-financial assets (excluding natural capital); and (iii) natural capital. In addition, the discussion of depreciation (in the 2008 SNA referred to as consumption of fixed capital) has been re-allocated after the discussion of all asset categories, because of the addition of a discussion on depletion. All these re-allocations have not been shown in the form of track changes.

A. Introduction

- 11.1 The capital account is the first of four accounts dealing with changes in the values of assets held by institutional units. It records transactions in non-financial assets. The financial account records transactions in financial assets and liabilities. The other changes in the volume of assets account records changes in the value of both non-financial and financial assets that result from neither transactions nor price changes. The effects of price changes are recorded in the revaluation account. These four accounts enable the change in the net worth of an institutional unit or sector between the beginning and end of the accounting period to be decomposed into its constituent elements by recording all changes in the prices and volumes of assets, whether resulting from transactions or not. The impact of all four accounts is brought together in the balance sheets. The immediately following chapters describe the other accounts just mentioned.
- 11.2 The purpose of the capital account, shown in table 1011.1, is to record the values of the non-financial assets that are acquired, or disposed of, by resident institutional units by engaging in transactions and to show the change in net worth due to saving and capital transfers. The transactions may be either with other institutional units, both resident and non-resident, or internal transactions in which units retain products that they have produced themselves for use as capital formation.
- 11.3 When compiling balance sheets, it is customary to record assets on the left-hand side and liabilities and net worth on the right-hand side. The same convention is followed in the accumulation accounts, where changes in assets are recorded on the left-hand side and other items on the right-hand side. As in the current accounts, the balancing item of the capital account, net lending or net borrowing, is recorded on the left-hand side. ~~Consumption of fixed capital is~~ Depreciation and depletion are also recorded on the left-hand side of the capital account.
- 11.4 The right-hand side of the capital account records the ~~resources~~ revenues available for the accumulation of assets. These consist of net saving, the balancing item carried forward from the use of income account, and capital transfers. Capital transfers payable are recorded with a negative sign.

1. The definitions of ownership and assets

- 11.5 Ownership and assets are defined in chapter 34 but it is helpful to recall some of the key features of the definitions here. It is important to distinguish between legal ownership and economic ownership. The legal owner of entities/items such as goods and services, natural resources, financial assets and liabilities is the institutional unit entitled in law and sustainable under the law to claim the benefits associated with the entities/items. By contrast, the economic owner of entities/items such as goods and services, natural resources, financial assets and liabilities is the institutional unit entitled to claim the benefits associated with the use of the entity in question in the course of an economic activity by virtue of accepting the associated risks.
- 11.6 Every entity has both a legal owner and an economic owner, though in many cases the economic owner and the legal owner of an entity are the same. Where they are not, the legal owner has handed responsibility for the risk involved in using the entity in an economic activity to the economic owner along with associated benefits. In return the legal owner accepts another package of risks and benefits from the economic owner.

11.7 When government claims legal ownership of an entity on behalf of the community at large, the benefits also accrue to the government on behalf of the community at large. Thus government is regarded as both the legal and economic owner of these ~~entities~~ items.

11.8 Especially in relation to natural resources, a government is typically the legal owner and grants rights or permissions to exploit the resources to another institutional unit. In such cases, the benefits may be shared between the government and the exploiter of the resources, and the economic ownership of the resources is split between the two entities involved, in line with the shares of resource rent each entity appropriates. (See chapter 27 for more details.)

~~11.7~~11.9 In the case of multinational enterprise groups, the economic ownership of intellectual property products may be difficult to determine. Various arrangements, including the routing via special purpose entities, exist. The use of a decision tree is recommended for the appropriate allocation and recording of these assets across the MNE group. See chapter 23 for more information.

~~11.8~~11.10 *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.* All assets in the integrated framework of national accounts ~~SNA~~ are economic assets.

2. Non-financial assets

~~11.9~~11.11 ~~Two~~Three different categories of non-financial assets are distinguished from each other: produced assets (excluding natural capital), ~~and~~ non-produced assets (excluding natural capital), and natural capital. Natural capital encompasses both natural resources and ecosystem assets. The latter assets are not recognised in the integrated framework of national accounts. For more details on ecosystem assets, see chapter 35 as well as the System of Environmental-Economic Accounting (SEEA) Ecosystem Accounting.

- a. Produced assets (excluding natural capital) are non-financial assets that have come into existence as outputs from production processes that fall within the production boundary of the integrated framework of national accounts ~~SNA~~.
- b. Non-produced assets (excluding natural capital) are non-financial assets that have come into existence in ways other than through processes of production.
- ~~b-c.~~ Natural capital, or more precisely in the context of the SNA, natural resources consist of assets that naturally occur, such as land, water resources, timber and fish stocks, and mineral and energy resources that have an economic value and over which ownership may be enforced and transferred. A significant part of natural resources is non-produced, although biological resources may be the result of human involvement, and have thus come into existence as outputs from production processes.

Produced assets (excluding produced natural capital)

~~11.10~~11.12 There are three main types of produced assets: fixed assets, inventories and valuables. Both fixed assets and inventories are assets that are held only by producers for purposes of production. Valuables may be held by any institutional unit and are primarily held as stores of value.

~~11.11~~11.13 *Fixed assets are produced assets that are used repeatedly or continuously in production processes for more than one year.* The distinguishing feature of a fixed asset is not that it is durable in some physical sense, but that it may be used repeatedly or continuously in production over a long period of time, which is taken to be more than one year. Some goods, such as coal, may be highly durable physically but cannot be fixed assets because they can be used once only. Fixed assets include not only structures, machinery and equipment but also various intellectual property products used in production, such as software, data and databases or artistic originals. ~~e~~Cultivated assets such as trees or animals that are used repeatedly or continuously to produce other products such as fruit or dairy products are excluded, and instead included in (produced) natural capital. ~~They also include intellectual property products such as software or artistic originals used in production.~~

~~11.12~~11.14 *Inventories are produced assets that consist of goods and services, which came into existence in the current period or in an earlier period, and that are held for sale, use in production or other use at a later date.* Inventories consist of stocks of outputs that are still held by the units that produced them prior to their being further processed, sold, delivered to other units or used in other ways and stocks of products acquired from other units that are intended to be used for intermediate consumption or for resale without further processing. Inventories of services consist of work-in-progress or finished products, for example architectural drawings, which are in the process of completion or are completed and waiting for the building to which they relate to be started. Inventories held by government include, but are not limited to, inventories of strategic materials, and grain and other commodities of special importance to the nation. Work-in-progress related to cultivated biological resources, such as the growth of single-use plants, trees and livestock that produce an output once only, is excluded, and instead included in (produced) natural capital. The same holds for biological resources yielding repeat products which have not yet matured.

~~11.13~~11.15 Valuables are produced ~~goods~~assets of considerable value that are not used primarily for purposes of production or consumption but are held as stores of value over time. Valuables are expected to appreciate or at least not to decline in real value, nor to deteriorate over time under normal conditions. They consist of precious metals and stones, jewellery, works of art, etc. Valuables may be held by all sectors of the economy.

Non-produced assets (excluding non-produced natural capital)

~~11.14~~11.16 *Non-produced assets consist of three categories: ~~natural resources; contracts, leases and licences; crypto assets without a corresponding liability designed to act as a medium of exchange; and purchased goodwill and marketing assets.~~*

~~11.15~~

~~11.16 *Natural resources consist of naturally occurring resources such as land, water resources, uncultivated forests and deposits of minerals that have an economic value.*~~

11.17 *Contracts, leases and licences are treated as assets only when two conditions are both satisfied.*

- a. *The terms of the contract, lease or licence specify a price for the use of an asset or provision of a service that differs from the price that would prevail in the absence of the contract, lease or licence.*
- b. *One party to the contract must be able legally and practically to realize this price difference.*

The second condition presupposes that a market for the contract exists. It is recommended that in practice contracts, leases and licences should only be recorded in the accounts when the holder does actually exercise his right to realize the price difference.

~~11.18~~ Contracts, leases and licenses may also include non-fungible tokens that grant limited commercial rights to another asset or product from which the owner of the NFT can derive economic benefits (e.g., some form of royalties).

~~11.19~~ Crypto assets without a corresponding liability designed to act as a medium of exchange relate to crypto assets for which there is no issuer. They may be designed to act as a general medium of exchange, or designed to act as medium of exchange within a platform only.

~~11.20~~ *Purchased goodwill and marketing assets represent the whole or part of the net worth of an institutional unit.* They are recorded only when a unit is purchased in its entirety or an identifiable marketing asset is sold to another unit.

Natural capital

~~11.21~~ As noted above, in the context of the SNA, natural capital is restricted to natural resources. These resources can be broken down into the following categories: land; mineral and energy resources, both non-renewable and renewable resources; biological resources; water resources; and a residual category containing, for

example, radio spectra. As noted before, natural capital includes both produced and non-produced assets.

11.1811.22 Environmental assets refer to a broader concept and are defined as “naturally occurring living and non-living components of the Earth, together constituting the biophysical environment, which may provide benefits to humanity” (SEEA 2012 Central Framework). In macroeconomic statistics, environmental assets are only recognised in as far they meet the asset boundary, by providing monetary benefits to their owners, either individually or collectively. Assets over which ownership rights have not, or cannot, be enforced, such as open seas or air, are excluded, unless exclusive right on the resources are established, for example in the form of quota regimes for capturing fish.

Table 10.111.1: The capital account - concise form - changes in assets

Table 10.111.1 (cont): The capital account - concise form - changes in liabilities and net worth

3. The structure of the capital account

Saving

11.1911.23 The right-hand side of the capital account represents changes in liabilities and net worth. The first item recorded on the right-hand side is the balancing item carried down from the use of disposable income account, net saving. When positive, net saving represents that part of disposable income that is not spent on consumption goods and services and must, therefore, be used to acquire non-financial or financial assets of one kind or another, including cash, or to repay liabilities. When negative, net saving measures the amount by which final consumption expenditure exceeds disposable income: the excess must be financed by disposing of assets or incurring new liabilities.

Capital transfers

11.2011.24 Capital transfers are unrequited transfers, ~~either in cash or in kind, in which the ownership where either the party making the transfer realizes the funds involved by disposing of an asset (other than cash or inventories) changes from one party to another; or that oblige one or both parties to acquire or dispose of an asset (other than cash or inventories); or where a liability is forgiven by the creditor, relinquishing a financial claim (other than accounts receivable) or the party receiving the transfer is obliged to acquire an asset (other than cash) or both conditions are met.~~ Capital transfers are often large and irregular but neither of these are necessary conditions for a transfer to be considered a capital rather than a current transfer. If there is doubt about whether a transfer should be treated as current or capital, it should be treated as current.

11.2111.25 Capital transfers receivable represent an increase in net worth and so are shown on the right-hand side of the account for the recipient. By convention, the matching amounts payable are also shown on the right-hand side of the account but as a negative entry (that is, a decrease in net worth) for the payer.

Changes in net worth due to saving and capital transfers

11.2211.26 The total of the entries on the right-hand side of the account is explicitly shown and described as changes in net worth due to saving and capital transfers. It is not a balancing item. *Changes in net worth due to saving and capital transfers represent the positive or negative amount available to the unit or sector for the acquisition of non-financial and financial assets.*

Acquisitions less disposals of non-financial assets

11.2311.27 The left-hand side of the capital account records how much of the change in net worth due to saving and capital transfers is used to acquire non-financial assets and how much is left to be explained by the

acquisition of financial assets or liabilities in the financial account. ~~Resources~~ Revenues coming from the disposal of existing assets appear as negative entries on the left-hand side of the account also. As well as purchases and sales of assets, non-financial assets acquired (or disposed of) via barter or by means of production for own use are included.

~~11.24~~ 11.28 ~~Three~~ The following headings for the net change in the value of non-financial assets are shown in the capital account:

- a. ~~Gross capital formation~~; Acquisitions less disposals of produced non-financial assets (excluding natural capital), broken down by:
 - ~~Gross fixed capital formation~~
 - ~~Depreciation~~
 - ~~Changes in inventories~~
 - ~~Acquisitions less disposals of valuables~~

~~11.25~~ —

~~Consumption of fixed capital;~~

- b. ~~Acquisitions less disposals of non-produced non-financial assets (excluding natural capital)~~;
- c. ~~Acquisitions less disposals of natural capital, broken down by:~~
 - ~~Gross fixed capital formation~~
 - ~~Depreciation~~
 - ~~Changes in inventories~~
 - ~~Acquisitions less disposals of non-produced non-financial assets~~
 - ~~Depletion~~

The treatment given to each of these categories of changes in assets is described in later sections of this chapter.

~~11.26~~ 11.29 ~~Gross capital formation shows the~~ The sum of acquisitions less disposals of produced assets, including produced natural capital, for purposes of fixed capital formation, inventories or valuables is referred to as gross capital formation. It is possible (if uncommon) for the gross capital formation of an individual institutional unit or sector to be negative if it sells off enough of its existing assets to other units or sectors.

11.30 ~~Consumption of fixed capital~~ Depreciation is the decline, during the course of the accounting period, in the current value of the stock of fixed assets, including cultivated biological resources, owned and used by a producer as a result of physical deterioration, normal obsolescence or normal accidental damage. Section E provides more details on depreciation.

11.31 ~~Depletion, in physical terms, represents the decrease in the quantity or value of the stock of a non-produced natural resource over an accounting period that is due to the extraction of the natural resource by economic units occurring at a level greater than that of regeneration; in monetary terms, it corresponds with the decline in future income, due to extraction, that can be earned from a resource, the value of which is based on the physical flows of depletion using the price of the natural resource in situ.~~ Section E provides more details on depletion.

~~11.27~~ 11.32 When, as recommended in the SNA, the balancing item carried down from the use of income account is net saving, it already reflects the fact that net worth has been reduced by the amount of ~~consumption of fixed capital~~ depreciation and depletion, the amount by which the relevant ~~fixed~~ assets are reduced in the period. Since the capital account is designed to show the way in which net worth is augmented by the acquisition of non-financial assets, ~~depreciation~~ this amount has to be offset from the value of new acquisitions of fixed assets so the addition to the capital stock of fixed assets is a net amount. For this reason, ~~consumption of fixed capital~~ depreciation is recorded as a negative change in assets on the left-hand side of

the capital account. In the case of depletion, the relevant (non-produced) assets typically come into existence via newly exploited resources, which are recorded as other changes in the volume of assets.

~~11.28~~ If it is not feasible to measure consumption of fixed capital because of lack of data, the saving figure carried forward from the use of income account has to be gross. In this case, there is no entry for consumption of fixed capital in the capital account. If consumption of fixed capital has to be omitted from both sides of the account, the balancing item of the account is not affected; net lending or borrowing can be derived residually whether or not consumption of fixed capital can be estimated. However, if consumption of fixed capital is not estimated, the accumulation accounts do not record all changes between two successive balance sheets.

~~11.29~~

~~11.33~~ ~~The remaining~~One of the items on the left-hand side of the capital account refers to the acquisitions less disposals of non-produced non-financial assets (excluding natural capital). The total value of the acquisitions less disposals of ~~non-produced non-financial~~these assets may also be positive or negative. ~~Since natural resources are owned by units that are either actually or notionally resident, this part will generally be zero for the economy as a whole. (An exception exists for land purchased by a foreign government for an embassy or military base.)~~ However, as there may be transactions in contracts, leases and licences, crypto assets without a corresponding liability designed to act as a medium of exchange, or marketing assets with non-resident units.

~~11.30~~~~11.34~~ The last item on the left-hand side of the capital account refers to acquisitions less disposals of natural capital. This item combines the acquisitions less disposals of both produced and non-produced natural resources. Since non-produced natural resources are owned by units that are either actually or notionally resident, this part will generally be zero for the economy as a whole. (An exception exists for land purchased by a foreign government for an embassy or military base.)

Net lending

~~11.34~~~~11.35~~ The balancing item of the capital account, net lending, is defined as the difference between changes in net worth due to saving and capital transfers and net acquisitions of non-financial assets (acquisitions less disposals of non-financial assets, less consumption of fixed capital depreciation and depletion). If the amount is negative it represents net borrowing. It shows the amount of the ~~resources~~revenues remaining for purposes of lending or that need to be borrowed. Even if funds are not actively lent but are retained in cash, or in a bank deposit, the holder of the counterpart obligations represented by these financial assets has in effect borrowed from the unit holding the cash or bank deposit.

~~11.32~~~~11.36~~ The identity between the balancing items of the capital account and the financial account is an important feature of the set of the accounts as a whole. What is borrowed by one unit must be lent by another and vice versa. The conceptual identity between the balancing items provides a check on the numerical consistency of the set of accounts as a whole, although the two balancing items are likely to diverge in practice because of errors of measurement.

~~11.33~~~~11.37~~ In general in the SNA, and especially in balancing items, the prefix net means excluding ~~the consumption of fixed capital depreciation and depletion~~. For net lending this is not the case; it represents the difference between those assets giving rise to making funds available to other units and those drawing funds from other units.

B. Gross capital formation Acquisitions less disposals of produced non-financial assets (excluding natural capital)

~~11.34~~~~11.38~~ ~~Gross capital formation is~~Acquisitions less disposals of produced non-financial assets (excluding natural capital) are measured by the total value of the gross fixed capital formation (excluding natural capital), changes in inventories (excluding natural capital) and acquisitions less disposals of valuables. Before discussing in detail the entries to be recorded under each of these items, it is necessary to clarify the coverage of the item and the application of accounting rules such as valuation, time of recording and the identification of ownership. This section focuses on gross capital formation excluding capital formation related to natural

[capital. The latter is discussed in section D.](#)

1. **Gross fixed capital formation (excluding natural capital)**

~~11.35~~11.39 Gross fixed capital formation ([excluding natural capital](#)) is measured by the total value of a producer's acquisitions, less disposals, of fixed assets during the accounting period plus certain specified expenditure on services that adds to the value of non-produced assets. In order to ensure that the coverage of gross fixed capital formation is precisely defined, it is necessary first to define what does and what does not constitute a fixed asset and what activities are treated as adding to the value of non-produced assets.

The asset boundary

~~11.36~~11.40 All goods and services supplied to the economy by means of production, imports or the disposal of produced assets must be used for exports, consumption (intermediate or final) or as part of capital formation. The boundary line between those products that are retained in the economy and are used for consumption and those products that are used for capital formation is known as the asset boundary. The asset boundary for fixed assets consists of goods and services that are used in production for more than one year.

11.41 Two exclusions from the asset boundary should be noted at the outset. The first is that consumer durables are not treated as fixed assets. The services these durables produce are household services outside the production boundary of the [integrated framework of national accountsSNA](#). If, for example, a washing machine were to be treated as a fixed asset, the production boundary would have to be extended to include all laundry services, whether undertaken by machine or by hand. As it stands, the production boundary restricts laundry services to those services provided to other units but includes services provided by both machine and by hand. However, owner-occupied dwellings are not treated as consumer durables but are included within the asset boundary. The owner-occupiers are treated as owners of unincorporated enterprises producing housing services for their own consumption. [For more information on an extended set of accounts which includes all unpaid household services produced for own final use, see chapter 34.](#)

~~11.37~~11.42 It is possible though that an asset is used for consumption purposes as well as for the purpose of producing goods and services. An example relates to the dual use of a car owned by a household for own travel and for providing taxi services to third parties. [Such instances have become more frequent with the digitalisation of the economy, which has enhanced the possibilities to provide such market services. In these cases, the asset in question needs to be partitioned, with one part recorded as final consumption expenditure and the other part recorded as gross fixed capital formation.](#)

~~11.38~~11.43 The second exclusion is pragmatic rather than conceptual and concerns small tools. Some goods may be used repeatedly, or continuously, in production over many years but may nevertheless be small, inexpensive and used to perform relatively simple operations. Hand tools such as saws, spades, knives, axes, hammers, screwdrivers and spanners or wrenches are examples. If expenditures on such tools take place at a fairly steady rate and if their value is small compared with expenditures on more complex machinery and equipment, it may be appropriate to treat the tools as materials or supplies used for intermediate consumption. Some flexibility is needed, however, depending on the relative importance of such tools. In countries in which they account for a significant part of the value of the total stock of an industry's durable producers' goods, they may be treated as fixed assets and their acquisition and disposal by producers recorded under gross fixed capital formation.

~~11.39~~11.44 Not all goods included within the asset boundary must be newly produced. Since assets have a long life, they may change hands but continue to function as fixed assets for their new owners. Thus it is important to define what existing fixed assets are and how they are treated in measuring gross fixed capital formation.

~~11.40~~11.45 Nor are all services included within the asset boundary immediately recognizable. Important classes of services are included in the asset boundary because of the impact they have on the value of new or existing assets. These are improvements to existing assets and the cost of ownership transfer of assets. These are described below after defining existing fixed assets.

Existing fixed assets

~~11.41~~11.46 Because assets have service lives that may range up to 50 years or more for dwellings or other structures, their ownership may change several times before they are eventually scrapped, demolished or abandoned. An existing fixed asset is one whose value was included in the stock of fixed capital of at least one producer unit in the domestic economy at some earlier point in time either in the current period or in the immediately previous accounting period. In many countries, well-organized markets exist to facilitate the buying and selling of many kinds of existing fixed assets, notably automobiles, ships, aircraft, dwellings and other structures. Indeed, the number of existing dwellings bought and sold within a given time period may considerably exceed the number of new dwellings. In practice, most existing fixed assets will have been used in production by their current owners, but an existing capital good might be sold by its owner before it has actually been used.

~~11.42~~11.47 In general, sales or other disposals of existing goods, whether fixed assets or not, are recorded as negative expenditures or negative acquisitions. Thus, when the ownership of an existing fixed asset is transferred from one resident producer to another, the value of the asset sold, bartered or transferred is recorded as negative gross fixed capital formation by the former and as positive gross fixed capital formation by the latter. The value of the positive gross fixed capital formation recorded for the purchaser exceeds the value of the negative gross fixed capital formation recorded for the seller by the value of the costs of ownership transfer incurred by the purchaser. The treatment of these costs is explained in more detail in a later section.

~~11.43~~11.48 When the sale takes place between two resident producers, the positive and negative values recorded for gross fixed capital formation cancel out for the economy as a whole except for the costs of ownership transfer. Similarly, if an existing immovable fixed asset, such as a building, is sold to a non-resident, by convention the latter is treated as purchasing a financial asset that is the equity of a notional resident unit while the notional resident unit is deemed to purchase the asset, so that the sale and purchase of the asset takes place between resident units. However, if an existing movable fixed asset, such as a ship or aircraft, is exported, no positive gross fixed capital formation is recorded elsewhere in the economy to offset the seller's negative gross fixed capital formation.

~~11.44~~11.49 Some durable goods, such as vehicles, may be classified as fixed assets or as consumer durables depending upon the owner and the purpose for which they are used. If, therefore, the ownership of such a good were transferred from an enterprise to a household to be used for final consumption, negative gross fixed capital formation is recorded for the enterprise and positive consumption expenditure by the household. If a vehicle owned by a household were to be acquired by an enterprise, it would be recorded as an acquisition of a "new" fixed asset by the enterprise, even though it is an existing good, and as negative consumption expenditure by the household. A similar treatment is applied to imports of used products acquired by resident producers as assets.

~~11.45~~11.50 Thus, it is perfectly possible for gross fixed capital formation to be negative as a result of the sale or disposal of existing fixed assets, although aggregate gross fixed capital formation is unlikely to be negative for large groups of units such as subsectors, sectors or the economy as a whole.

Improvements to existing assets

~~11.46~~11.51 Gross fixed capital formation may take the form of improvements to existing fixed assets, such as buildings or computer software, that increase their productive capacity, extend their service lives, or both. By definition, such gross fixed capital formation does not lead to the creation of new assets that can be separately identified and valued, but to an increase in the value of the asset that has been improved.

Accordingly, it is the improved asset that is henceforth relevant to the [integrated framework of national accounts](#)^{SNA} and on which ~~consumption of fixed capital~~[depreciation](#) must be calculated subsequently.

~~11.47~~11.52 A different treatment is applied to improvements to land in its natural state. In this case the improvements are treated as the creation of a new fixed asset and are not regarded as giving rise to an increase in the value of the natural resource. If land, once improved, is further improved, then the normal treatment of improvements to existing fixed assets applies.

11.4811.53 The distinction between ordinary maintenance and repairs that constitute intermediate consumption and those that are treated as capital formation is not clear cut. As explained in paragraphs 6.2267.226 to 6.229,7.229, ordinary maintenance and repairs are distinguished by two features:

- They are activities that must be undertaken regularly in order to maintain a fixed asset in working order over its expected service life. The owner or user of the asset has no choice about whether or not to undertake ordinary maintenance and repairs if the asset in question is to continue to be used in production;
- Ordinary maintenance and repairs do not change the fixed asset's performance, productive capacity or expected service life. They simply maintain it in good working order, if necessary by replacing defective parts by new parts of the same kind.

11.4911.54 On the other hand, improvements to existing fixed assets that constitute gross fixed formation must go well beyond the requirements of ordinary maintenance and repairs. They must bring about significant changes in some of the characteristics of existing fixed assets. They may be distinguished by the following features:

- The decision to renovate, reconstruct or enlarge a fixed asset is a deliberate investment decision that may be taken any time, even when the good in question is in good working order and not in need of repair. Major renovations of ships, buildings or other structures are frequently undertaken well before the end of their normal service lives;
- Major renovations, reconstructions or enlargements increase the performance or productive capacity of existing fixed assets or significantly extend their previously expected service lives, or both. Enlarging or extending an existing building or structure constitutes a major change in this sense, as does the refitting or restructuring of the interior of a building or ship or a major extension to or enhancement of an existing software system.

11.5011.55 It is difficult to provide simple objective criteria that enable improvements to be distinguished from repairs because any repair may be said to improve the performance or extend the working life of the unrepaid asset. For example, machines may cease to function at all because of the failure of one small part. The replacement of such a part does not, however, constitute gross fixed capital formation. Thus, improvements have to be identified either by the magnitude of the changes in the characteristics of the fixed assets such as size, shape, performance, capacity, or expected service lives, or by the fact that improvements are not the kinds of changes that are observed to take place routinely in other fixed assets of the same kind, as part of ordinary maintenance and repair programmes.

Costs incurred on acquisition and disposal of assets

11.5111.56 Purchasing a fixed asset is often a complicated procedure that may involve using lawyers to establish legal title to the asset, engineers to certify that it is in satisfactory working order and so on. There may also be taxes to be paid occasioned by the change of ownership of the item. Further, in the case of highly complex machinery there may be significant costs associated with delivery and installation that were not included in the purchase price.

11.5211.57 The benefits to be derived from the use of the asset in production have to cover these costs as well as the initial price of the asset. Costs incurred on acquisition of an asset are treated as an integral part of the value of that unit's gross fixed capital formation. The value at which the asset enters the balance sheet of its new owner therefore includes these costs. This applies to both new and existing assets.

11.5311.58 Just as there may be costs incurred on the acquisition of an asset, there may also be costs incurred on the disposal of an asset. Some of these may be parallel to those costs incurred on acquisition, for example legal fees and disinstallation costs. However, in the case of some significantly large and important assets, such as oil rigs and nuclear power stations, there may also be major costs associated with the decommissioning of the asset at the end of its productive life. For some land sites, such as those used for landfill, there may be large costs associated with rehabilitation of the site. These are referred to collectively as terminal costs.

~~11.54~~11.59 All these costs associated with acquiring and disposing of assets may be described as costs of ownership transfer. *The costs of ownership transfer consist of the following kinds of items:*

- a. *All professional charges or commissions incurred by both units acquiring or disposing of an asset such as fees paid to lawyers, architects, surveyors, engineers and valuers, and commissions paid to estate agents and auctioneers;*
- b. *Any trade and transport costs separately invoiced to the purchaser;*
- c. *All taxes payable by the unit acquiring the asset on the transfer of ownership of the asset;*
- d. *Any tax payable on the disposal of an asset;*
- e. *Any delivery and installation or disinstallation costs not included in the price of the asset being acquired or disposed of; and*
- f. *Any terminal costs incurred at the end of an asset's life such as those required to render the structure safe or to restore the environment in which it is situated. Although incurred at the end of the asset's life, such terminal costs are added to the acquisition value of the assets (see paragraphs 11.228 to 11.230).*

~~11.55~~11.60 All these costs of ownership transfer are treated as gross fixed capital formation. They are attributed to the purchaser or seller of the asset according to which unit bears the responsibility of meeting the costs. The time of recording of these costs is discussed below. The costs are written off via ~~consumption of fixed capital~~depreciation over the period the new owner expects to hold the asset, as discussed in the section on ~~consumption of fixed capital~~depreciation except for the terminal costs that should be written off over the whole life of the asset.

Time of recording

~~11.56~~11.61 The general principle for the time of recording of acquisitions less disposals of fixed assets is when the ownership of the fixed assets is transferred to the institutional unit that intends to use them in production. Except in two special cases, this time is not generally the same as the time at which the fixed assets are produced. Nor is it necessarily the time at which they are put to use in the production of other goods or services.

~~11.57~~11.62 The two exceptions cover assets that take some time to produce such as construction projects, intellectual property products and the like and some cultivated biological resources. In general, incomplete construction projects ~~and immature animals and plantations~~ are treated as work-in-progress. They are reclassified from inventories to fixed capital when complete and delivered to the unit intending to use them as fixed assets. The same principles apply for However, when the assets are being produced on own account, i.e., the partially completed products are recorded as work-in-progress until completion. As this may be more difficult to apply in practice, particularly in the case of fixed assets such as intellectual property products, the partially completed products produced on own account may need to be recorded directly as fixed capital formation as work takes place. The same principles as the ones for construction projects apply to some cultivated biological resources yielding repeat products (see section D).

~~11.58~~11.63 When assets are developed under a contract of sale, the producer records work-in-progress as normal. However, in the case of an effective transfer of ownership, a transfer of the partially completed product to the final owner should be recorded. Such acquisitions of partially completed products are recorded as work-in-progress in the accounts of the final owner until the completion of the fixed asset. In the case of stage payments, any differences between the value of the stage payments and the value of the effective transfer of ownership should be recorded as other accounts receivable/payable. If the effective transfer of ownership cannot be determined in practice, stage payments could be used as a proxy for the transfer of ownership. but when stage payments are made, these are regarded as purchase of [part of] a fixed asset or as a trade advance if the value of the stage payment exceeds the value of the work put in place. In the latter case, work is recorded as fixed capital delivered to the final owner as work proceeds until the trade credit is exhausted. When there is no contract of sale agreed in advance, the output produced by the enterprise must be recorded as work-in-progress or as additions to the producers' inventories of finished goods, depending

on whether the product is completed. For example, finished dwellings built speculatively remain as additions to the producers' inventories of finished goods until they are sold or otherwise acquired by users.

Ownership of assets

~~11.59~~11.64 In most cases, the ownership of fixed assets is straightforward; it is the unit that acquires the asset for use in production. There are however, three exceptions to be noted. One concerns assets subject to a financial lease; the second concerns assets produced by communal effort; the third concerns immovable assets owned by non-residents.

~~11.60~~11.65 A financial lease is a contract between a lessor and a lessee whereby the lessor legally owns the good but the terms of the lease are such that the lessee takes over both the economic risks and rewards of using the asset in production. In effect, therefore, the lessee becomes the economic owner of the asset even if the lessor remains the legal owner. In these cases, the asset is recorded as being acquired by the lessee in return for a loan extended by the lessor to the lessee. The asset is then recorded on the balance sheet of the lessee and not the lessor. The payments due under the lease arrangement are treated as forming a repayment of the principal of the loan and a payment of interest and possibly a service charge. More details of these arrangements are given in chapter ~~17~~27.

~~11.61~~11.66 Certain structures may be produced for own communal use by groups of households: for example, buildings, roads, bridges, etc. After they are finished, the ownership of such structures may then be transferred to some government unit that assumes responsibility for their maintenance. When the transfer occurs, the gross fixed capital formation on own account originally attributed to the group of households is cancelled by their negative gross fixed capital formation resulting from the capital transfer in kind made to the government unit. The final gross fixed capital formation remaining is that of the government unit resulting from its acquisition of the asset through the capital transfer in kind. If no such transfer exists and the structure remains the communal property of the group of households responsible for its construction, an NPISH providing collective services should be created.

~~11.62~~11.67 All buildings and other structures within the economic territory are deemed, by convention, to be owned by resident units. If the economic owner (or lessee under a financial lease) would not otherwise qualify as a resident unit, a notional resident unit is created for this purpose. The notional resident unit is assumed to purchase (or lease) the building or structure. The legal owner (or lessor) is deemed to hold equivalent equity in the notional resident unit. If a building or structure is owned in part by a resident unit and in part by one or several non-residents, there is one notional resident unit established with each of the owners having a proportionate share of the equity of the notional resident unit.

~~11.63~~11.68 A further consideration to be taken into account in determining ownership concerns assets built under a public-private partnership (PPP), such as a private finance initiative (PFI), sometimes also described as a public-private partnership (PPP) or a build, own, operate, transfer (BOOT) scheme or some other similar shorthand. Such schemes are under accounting scrutiny at the time of writing. Provisional More guidance on how to ascribe the ownership of such schemes is given in chapter ~~22~~30.

Valuation

~~11.64~~11.69 The various components of acquisitions and disposals of fixed assets are listed below:

- a. Value of fixed assets purchased;
- b. Value of fixed assets acquired through barter;
- c. Value of fixed assets received as capital transfers in kind;
- d. Value of fixed assets retained by their producers for their own use, including the value of any fixed assets being produced on own account for which it cannot be determined whether or not they are fully~~that are not yet~~ completed or ~~fully~~-mature;

less

- e. Value of existing fixed assets sold;
- f. Value of existing fixed assets surrendered in barter;
- g. Value of existing fixed assets surrendered as capital transfers in kind.

Acquisitions of partially completed fixed assets are recorded as work-in-progress until the asset has been completed; see also paragraphs 11.62 and 11.63. Items (a) to (d) include new assets, existing assets, the value of improvements to assets and the cost of ownership transfers in respect of these assets. Items (e), (f) and (g) include disposals of assets that may cease to be used as fixed assets by their new owners: for example, vehicles sold by enterprises to households for their personal use, assets that are scrapped or demolished by their new owners and assets that are exported.

~~11.65~~11.70 Fixed assets acquired through barter are valued at their estimated purchasers' prices plus any costs of ownership transfer. In practice, neither taxes on products nor transportation costs may apply, in which case the purchasers' prices will not differ from the basic prices of the product. Fixed assets produced for own gross fixed capital or assets transferred in kind are valued at their estimated basic prices, or by their costs of production when satisfactory estimates of their basic prices cannot be made.

~~11.66~~11.71 Special considerations apply to fixed assets produced by communal construction by households. If the value of the asset must be estimated on the basis of costs, and some or all of the labour is provided free, as may happen, an estimate of what the cost of paid labour would be must be included in the estimated total production costs using wage rates for similar kinds of labour in the vicinity or region. Otherwise, the value of the finished structure will be seriously underestimated. However, this estimate is not treated as compensation/remuneration of employees but as gross mixed income. This income accrues to the households concerned who are then assumed to use it to "purchase" the final construction. If the construction is then handed over to government, there is negative gross fixed capital formation recorded by the community offsetting their previously recorded acquisition of the asset and positive gross fixed capital formation recorded by government, along with a capital transfer of the value of the construction from the community to government.

Transactions in fixed assets

~~11.67~~11.72 Gross fixed capital formation in a particular category of fixed asset consists of the value of producers' acquisitions of new and existing products of this type less the value of their disposals of fixed assets of the same type. Gross fixed capital formation is not recorded until the ownership of the fixed assets is transferred to the unit that intends to use them in production. In the case of transfers of partially completed fixed assets, the asset is to be recorded as work-in-progress until the completed asset has been transferred, unless it is being constructed to order under a contract agreed in advance. Thus, ~~n~~New assets that have not yet been ~~transferred/sold~~ form part of additions to inventories of finished goods held by the producers of the assets. Similarly, an imported product is not recorded as gross fixed capital formation until it is acquired by the unit that intends to use it.

~~11.68~~11.73 Table 110.2 shows the changes in assets side of table 110.1 expanded to show the entries for transactions in fixed assets, excluding those related to natural capital. It will be noted that the integrated framework of national accountsSNA recommends showing acquisitions of certain categories of these assets separately from disposals of those assets when this provides analytically useful data.

~~11.69~~11.74 In presentations of the capital account, gross fixed capital formation is usually shown by type of asset, where the accounting principles of ~~the last paragraph 11.72~~ are applied to each category of fixed asset in turn. Table 110.2 also incorporates the classification of fixed assets (excluding natural capital) used in the integrated framework of national accountsSNA. Each of the main categories of fixed assets is defined and described in turn below.

~~11.70~~11.75 The integrated framework of national accountsSNA does not formally include a division between tangible and intangible assets in the classification. However, the categories of dwellings, other buildings and structures, machinery and equipment, and weapons systems (and cultivated-biological resources; see section D) can be taken to correspond to tangible assets and the other categories to intangible assets.

Dwellings

~~11.71~~11.76 Dwellings are buildings, or designated parts of buildings, that are used entirely or primarily as residences, including any associated structures, such as garages, and all permanent fixtures customarily installed in residences. Houseboats, barges, mobile homes and caravans used as principal residences of households are also included, as are public monuments identified primarily as dwellings.

~~11.72~~11.77 Examples include products included in **CPC 2 class 5311**, residential buildings and part of **CPC 2.group 387**. The former class includes single and multiple dwelling buildings as well as residential buildings for communities, retirement homes, hostels, orphans etc. The latter class includes prefabricated buildings, including those intended for housing or for buildings associated with housing such as garages.

~~11.73~~11.78 The costs of clearing and preparing the site for construction are part of the costs of new dwellings (and other buildings and structures) and are therefore included in the value of the buildings.

~~11.74~~11.79 Incomplete dwellings are recorded as work-in-progress until completion, even if are included to the extent that the ultimate user is deemed to have taken ownership, either because the construction is on own-account or as evidenced by the existence of a contract of sale or purchase. In the latter case, the work-in-progress is recorded in the accounts of the purchaser.

~~11.75~~11.80 Dwellings acquired for military personnel are included because they are used for the production of housing services, in the same way as dwellings acquired by civilian units.

Other buildings and structures

~~11.76~~11.81 Other buildings and structures comprise non-residential buildings, other structures and land improvements. These are described in turn below.

Buildings other than dwellings

~~11.77~~11.82 Buildings other than dwellings include whole buildings or parts of buildings not designated as dwellings. Fixtures, facilities and equipment that are integral parts of the structures are included. For new buildings, costs of site clearance and preparation are included. Public monuments identified primarily as non-residential buildings are also included.

~~11.78~~11.83 Examples include products included in **CPC 2.0 class 5312**, non-residential buildings, such as warehouses and industrial buildings, commercial buildings, buildings for public entertainment, hotels, restaurants, schools, hospitals, prisons etc. Prisons, schools and hospitals are regarded as buildings other than dwellings despite the fact that they may shelter institutional households.

Other structures

~~11.79~~11.84 ***Other structures include structures other than buildings, including the cost of the streets, sewer, etc.*** The costs of site clearance and preparation are also included. Public monuments for which identification as dwellings or non-residential buildings is not possible are included as are shafts, tunnels and other structures associated with mining mineral and energy resources, and the construction of sea walls, dykes, flood barriers etc. intended to improve the quality and quantity of land adjacent to them. The infrastructure necessary for aquaculture such as fish farms and shellfish beds is also included.

~~11.80~~11.85 Examples include products included in **CPC 2.0 group 532**, civil engineering works, such as highways, streets, roads, railways and airfield runways; bridges, elevated highways, tunnels and subways; waterways, harbours, dams and other waterworks; long-distance pipelines, communication and power lines; local pipelines and cables, ancillary works; constructions for mining and manufacture; and constructions for sport and recreation.

Table 10.211.2: The capital account - the classification of fixed assets

~~11.84~~11.86 The construction of new public monuments constitutes gross fixed capital formation and similarly, major improvements to existing public monuments are also included in gross fixed capital formation. **Public monuments are identifiable because of particular historical, national, regional, local, religious or symbolic significance.** They are accessible to the general public, and visitors are often charged for admission to the monuments or their vicinity. Their owners, who may be government units, non-profit institutions servicing households (NPISHs), corporations or households, typically use public monuments to produce cultural or entertainment-type services. In principle, the gross fixed capital formation in public monuments should be included in dwellings, non-residential buildings, and other structures as appropriate; in practice, it may be desirable to classify them with other structures. ~~Consumption of fixed capital~~Depreciation on new monuments, or on major improvements to existing monuments, should be calculated on the assumption of appropriately long service lives.

Land improvements

~~11.82~~11.87 **Land improvements are the result of actions that lead to major improvements in the quantity, quality or productivity of land, or prevent its deterioration.** Activities such as land clearance, land contouring, creation of wells and watering holes that are integral to the land in question are to be treated as resulting in land improvements. Activities such as the creation of seawalls, dykes, dams and major irrigation systems which are in the vicinity of the land but not integral to it, which often affect land belonging to several owners and which are often carried out by government, result in assets that are to be classified as structures.

~~11.83~~11.88 Land improvements represent a category of fixed assets distinct from the non-produced land asset as it existed before improvement. Land before improvements are effected remains a non-produced asset and as such is subject to holding gains and losses separately from price changes affecting the improvements. In cases where it is not possible to separate the value of the land before improvement and the value of those improvements, the land should be allocated to the category that represents the greater part of the value.

~~11.84~~11.89 The costs of ownership transfer on all land are to be included with land improvements.

Machinery and equipment

~~11.85~~11.90 **Machinery and equipment cover transport equipment, machinery for information, communication and telecommunications (ICT) equipment, and other machinery and equipment.** As explained above, machinery and equipment under a financial lease are treated as acquired by the user (lessee) rather than as acquired by the lessor. Tools that are relatively inexpensive and purchased at a relatively steady rate, such as hand tools, may be excluded. Also excluded are machinery and equipment integral to buildings that are included in dwellings and non-residential buildings. Machinery and equipment other than weapons systems acquired for military purposes are included; weapons systems form another category.

~~11.86~~11.91 Machinery and equipment such as vehicles, furniture, kitchen equipment, computers, communications equipment, etc. that are acquired by households for purposes of final consumption are not fixed assets and their acquisition is not treated as gross fixed capital formation. However, houseboats, barges, mobile homes and caravans that are used as the principal residences of households are treated as dwellings, so that their acquisition by households is included in gross fixed capital formation.

Transport equipment

~~11.87~~11.92 **Transport equipment consists of equipment for moving people and objects.** Examples include products other than parts included in CPC 2.0 division 49, transport equipment, such as motor vehicles, trailers and semi-trailers; ships; railway and tramway locomotives and rolling stock; aircraft and spacecraft; and motorcycles, bicycles, etc.

ICT equipment

11.8811.93 *Information, computer and telecommunications (ICT) equipment consists of devices using electronic controls and also the electronic components forming part of these devices.* Examples are products within **CPC 2.0 categories 452 and 472**. In practice, this narrows the coverage of ICT equipment mostly to computer hardware and telecommunications equipment.

Other machinery and equipment

11.8911.94 *Other machinery and equipment consists of machinery and equipment not elsewhere classified.* Examples include products other than parts and items identified in other categories of fixed capital formation included in **CPC 2.0 divisions 43**, general purpose machinery; **44**, special purpose machinery; **45**, office, accounting and computing equipment; **46**, electrical machinery and apparatus; **47**, radio, television and communication equipment and apparatus; and **48**, medical appliances, precision and optical instruments, watches and clocks. Other examples are products other than parts included in **CPC 2.0 groups 337**, fuel elements (cartridges) for nuclear reactors; **381**, furniture; **383**, musical instruments; **384**, sports goods; and **423**, steam generators except central heating boilers.

Weapons systems

11.9011.95 *Weapons systems include vehicles and other equipment such as warships, submarines, military aircraft, tanks, missile carriers and launchers, etc.* Most single-use weapons they deliver, such as ammunition, missiles, rockets, bombs, etc., are treated as military inventories. However, some single-use items, such as certain types of ballistic missile with a highly destructive capability, may provide an ongoing service of deterrence against aggressors and therefore meet the general criteria for classification as fixed assets.

Costs of ownership transfer on non-produced assets

11.9411.96 The costs of ownership transfer on non-produced assets represent produced assets but their value cannot be integrated with the value of another produced asset. They must therefore be shown as a separate category of gross fixed capital formation. An exception is made in the case of land where costs of ownership transfer are treated by convention as land improvements. Costs of ownership transfer are defined in **paragraphs 11.560.48 to 11.600.52**.

Intellectual property products

11.9211.97 Examples of intellectual property products are the results of research and development, mineral exploration and evaluation, computer software (including artificial intelligence), data and databases, and entertainment, literary or artistic originals. They are characterized by the fact that most of their value is attributable to intellectual endeavour. They can be described in general terms in the following way. Intellectual property products are the result of research, development, investigation or innovation leading to knowledge or the creation of artificial intelligence systems that the developers can market or use to their own benefit in production because use of the knowledge is restricted by means of legal or other protection. The knowledge may be embodied in a free-standing product or may be embodied in another. When the latter is the case, the product embodying the knowledge has an increased price relative to a similar product without this embodied knowledge. The knowledge remains an asset as long as its use can create some form of monopoly profits for its owner. When it is no longer protected or becomes outdated by later developments, it ceases to be an asset.

11.9311.98 Some intellectual property products are used solely by the unit responsible for their development or by a single unit to whom the product is transferred. Mineral exploration and evaluation is an example. Other products, such as computer software (including data and databases) and artistic originals, are used in two forms. The first is the original or “master copy”. This is frequently controlled by a single unit but exceptions

exist as explained below. The original is used to make copies that are in turn supplied to other units. The copies may be sold outright or made available under a licence.

- 11.99 A copy sold outright may be treated as a fixed asset if it satisfies the necessary conditions, that is, it will be used in production for a period in excess of one year. A copy made available under a licence to use may also be treated as a fixed asset if it meets the necessary conditions, that is, it is expected to be used in production for more than one year and the licensee assumes all the risks and rewards of ownership. A good, but not necessary, indication is if the licence to use is purchased with a single payment for use over a multiyear period. If the acquisition of a copy with a licence to use is purchased with regular payments over a multiyear contract and the licensee is judged to have acquired economic ownership of the copy, then it should be regarded as the acquisition of an asset. If regular payments are made for a licence to use without a long-term contract, then the payments are treated as payments for a service. If there is a large initial payment followed by a series of smaller payments in succeeding years, the initial payment is recorded as gross fixed capital formation and the succeeding payments are treated as payments for a service. If the licence allows the licensee to reproduce the original and subsequently assume responsibility for the distribution, support and maintenance of these copies, then this is described as a licence to reproduce and should be regarded as the sale of part or whole of the original to the unit holding the licence to reproduce.
- 11.100 Intellectual property products such as software may be hosted in a cloud computing datacentre. This does not change the ownership of the license as a software asset. A user of remotely accessed software may purchase a license from a software publisher as a software asset and separately purchase the cloud computing infrastructure services of the processing time and storage needed to utilise the hosted software. Cloud computing users who do not have their own software license incur pay-per-use software license charges when they run software in the cloud. The entire fee for accessing the software is retained by the cloud computing enterprise if it owns the software (either because it is the software developer or because it has acquired all rights to the software) or has purchased a license from the software publisher that includes rights to offer pay-per-use software rentals. In these cases, the software original or software copy is a fixed asset of the cloud computing enterprise. In other cases, the cloud computing provider passes on a portion of the pay-per-use software license fees to the software publisher and receives margin income from reselling software services supplied by the software publisher. However, it may be more practical to treat the cloud computing enterprise as purchasing intermediate inputs of services from the software publisher and supplying software services to the cloud computing users than as supplying distributing software services on margin.
- 11.101 Subscriptions from software publishers are not cloud computing or hosting services even if the publisher delivers the software via remote access over a network. Software publishers often take advantage of remote access to distribute regular updates, making the product seem like software-as-a-service. Software-as-a-service would be normally recorded as intermediate consumption, but if the user has purchased a long-term software license, the subscription should be recorded as a software asset of the license holder (i.e., the user of the software), and the periodic software updates should be viewed as maintenance of this asset. For example, a license to use a piece of software over a period lasting more than a year would be recorded as the acquisition of a fixed asset even if the software is frequently updated during the term of the license. For more information on the impact of digitalization on the measurement of the economy, see chapter 22.
- 11.102 When copies are distributed by the owner free of charge, then no flows between the owner and recipients are recorded in the SNA. If, despite making copies freely available, the owner still expects to obtain benefits, then the present value of those benefits should be recorded in its balance sheet. It may be that when the information was distributed freely it was incomplete and the owner intends to make more detailed information available at a price later. Software distributed freely at the beta test stage is one example. Alternatively, the owner justifies the expenditure on the basis of the benefits to its own production and may make copies available for marketing purposes, generating goodwill or in cases it considers deserving.
- 11.9411.103 A more prominent example in the age of digitalisation concerns open-source software which is developed, maintained, and supplied through the contributions of developers from universities, government research institutions, non-profit institutions, private corporations and individuals. The contributions by developers provided for free may be motivated by the future use of the resulting software. The value of such open-source software produced by programmers employed by corporations, government, or NPISHs is usually already included in measures of own-account software investment as estimated by the sum-of-costs method, unless the developer is an individual not being employed and remunerated. Again, for more

[information, see chapter 22.](#)

~~11.95~~11.104 It is often the case for some intellectual property products that some of the benefits accrue to units other than the owner to the extent they stimulate the production of other intellectual property products by other units. Examples of such spillovers include a breakthrough in the development of a new class of drug leading other enterprises to develop competing drugs of the same type, and the success or failure of mineral exploration in a particular zone informing other units with exploration rights in a neighbouring zone. These are treated in the same way as other externalities in the SNA. Unless there is a quantifiable monetary impact for one or both parties, nothing is recorded in the [integrated framework of national accountsSNA](#). [More detailed guidance can be found in theA Handbook on Deriving Capital Measures of Intellectual Property Products \(Organisation for Economic Co- operation and Development, 2009forthcoming\) is under preparation.](#)

Research and development

~~11.96~~11.105 Intellectual property products include the results of research and development (R&D). Research and [experimental] development consists of the value of expenditures on creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and use of this stock of knowledge to devise new applications. This does not extend to including human capital as assets within the SNA. The value of research and development (R&D) should be determined in terms of the economic benefits it is expected to provide in the future. This includes the provision of public services in the case of R&D acquired by government. In principle, R&D that does not provide an economic benefit to its owner does not constitute a fixed asset and should be treated as intermediate consumption. Unless the market value of the R&D is observed directly, it may, by convention, be valued at the sum of costs, including the cost of unsuccessful R&D, as described in chapter [76](#).

~~11.97~~11.106 R&D should be recognized as part of capital formation. In order to achieve this, several issues have to be addressed. These include deriving measures of research and development, price indices and service lives. Specific guidelines, together with handbooks on methodology and practice, ~~will~~ provide a useful way of working towards solutions that give the appropriate level of confidence in the resulting measures.

~~11.98~~11.107 With the inclusion of R&D expenditure as capital formation, patented ~~entities~~[items](#) no longer feature as assets in the SNA. The patent agreement is to be seen instead as the legal agreement concerning the terms on which access to the R&D is granted. The patent agreement is a form of licence to use which is treated as giving rise to payments for services or the acquisition of an asset.

Mineral exploration and evaluation

~~11.99~~11.108 Mineral exploration and evaluation consists of the value of expenditures on exploration for petroleum and natural gas and for non-petroleum deposits and subsequent evaluation of the discoveries made. These expenditures include prelicence costs, licence and acquisition costs, appraisal costs and the costs of actual test drilling and boring, as well as the costs of aerial and other surveys, transportation costs, etc., incurred to make it possible to carry out the tests. Re-evaluations may take place after commercial exploitation of the reserve has started and the cost of these re-evaluations is also included in gross fixed capital formation.

~~11.100~~11.109 Mineral exploration is undertaken in order to discover new deposits of minerals or fuels that may be exploited commercially. Such exploration may be undertaken on own account by enterprises engaged in mining or the extraction of fuels. Alternatively, specialized enterprises may carry out exploration either for their own purposes or for fees. The information obtained from exploration influences the production activities of those who obtain it over a number of years. The expenditures incurred on exploration within a given accounting period, whether undertaken on own account or not, are therefore treated as expenditures on the acquisition of an intellectual property product and included in the enterprise's gross fixed capital formation.

~~11.101~~11.110 The expenditures included in gross fixed capital formation include not only the costs of actual test drillings and borings, but also the costs incurred to make it possible to carry out tests, for example, the costs of aerial or other surveys, transportation costs, etc. The value of the resulting asset is not measured by the

value of new deposits discovered by the exploration but by the value of the resources allocated to exploration during the accounting period. When the activities are carried out by contractors, the prices charged by these contractors, including their operating surplus, become part of the value of the expenditures incurred. ~~Consumption of fixed capital~~ Depreciation may be calculated for such assets by using average service lives similar to those used by mining or oil corporations in their own accounts.

Computer software, data and databases

~~11.102~~ 11.111 Computer software, data and databases are grouped together because a computerized database, including the relevant data, cannot be developed independently of a database management system (DBMS), which is itself computer software.

Computer software, including artificial intelligence

~~11.103~~ 11.112 Computer software consists of computer programs, program descriptions and supporting materials for both systems and applications software. It also includes artificial intelligence systems. Gross fixed capital formation in computer software includes both the initial development and subsequent extensions of software as well as acquisition of copies that are classified as assets.

~~11.104~~ 11.113 The development of computer software represents the development of an intellectual property product. It is treated as an asset if it is to be used in production by its owner for more than one year. The software may be intended only for own use or may be intended for sale by means of copies. If copies of the software are sold on the market, their treatment follows the principles described in paragraph 11.99 to 11.101.10.100. Software purchased on the market is valued at purchasers' prices, while software developed in-house is valued at its estimated basic price, or at its costs of production if it is not possible to estimate the basic price.

Data and databases

11.114 Data and databases consist of electronic files of data, including the information content, organized in such a way as to permit resource-effective access and use of the data, either: Databases may be developed exclusively for own use in production for more than one year, or for sale as an entity or for sale by means of a licence to access the information contained. The standard conditions apply for when an own-use database, a purchased database or the licence to access a database constitutes an asset.

~~11.105~~ 11.115 Data and databases are conceptually distinct types of intellectual property products, but they are produced using similar inputs and measuring them separately is often difficult. Moreover, transactions in databases generally include the value of the data stored in the database. Data and databases are therefore combined into a single detailed class of intellectual property product. The creation of data and databases will generally have to be estimated by a sum-of-costs method.

~~11.116~~ The creation of a database will generally have to be estimated by a sum of costs approach. The cost of the database management system (DBMS) used should not be included in the costs of creating a database, but be treated as a computer software asset unless it is used under an operating lease. The cost of preparing data in the appropriate format is included in the cost of the database but not the cost of acquiring or producing the data (see below). Other costs will include staff time estimated on the basis of the amount of time spent in developing the database, an estimate of the capital services of the assets used in developing the database and costs of items used as intermediate consumption.

11.117 The main cost elements related to data consist of the costs of planning, preparing, and developing a data production strategy; the costs associated with accessing, recording, and storing information embedded in observable phenomena, which may include, but is not limited to, explicit purchases related to accessing observable phenomena or already produced data; and the costs associated with processing, cleaning, and organising the data to allow for use in productive activities.

~~11.106~~ 11.118 Data and databases for sale should be valued at their market price, which includes the value of the

information content. If the value of a software component is available separately, it should be recorded as the sale of software.

Entertainment, literary and artistic originals

~~11.107~~11.119 *Entertainment, literary and artistic originals consist of the original films, sound recordings, manuscripts, tapes, models, etc., on which drama performances, radio and television programming, musical performances, sporting events, literary and artistic output, etc., are recorded or embodied.* Such works are frequently developed on own account. Subsequently they may be sold outright or by means of licences. The standard conditions on when the originals and copies are recognized as fixed assets apply. If an original is acquired as a valuable, its production does not count as own account production of a fixed asset but it may have been classified as work-in-progress.

11.120 An original purchased on the market is valued at the purchaser's price. One developed in-house is valued at its estimated basic price or at its costs of production if it is not possible to estimate the basic price.

11.121 Households may produce user-generated content on digital platforms, which has an expected service life of more than one year. If the household receives remuneration from the content that it creates and uploads (e.g., advertising or subscription revenue), the investment in the relevant entertainment, literary or artistic original is within the production boundary of the integrated framework of national accounts, and the asset could be valued either at the net present value of the benefits generated with the asset, or as the sum of costs needed to produce the asset.

~~11.108~~11.122 Creation of entertainment, literary and artistic originals for personal enjoyment – a common leisure activity – is outside the production boundary. A complicating factor is that online platforms may benefit from user-generated content. For example, when personal posts attract the user's followers to the platform, they provide economic benefits, for example in the form of advertising revenue, to the platform. However, user-generated content cannot be considered an asset of the platform. The benefits accruing to the platform are externalities, positive spillovers of the user's production of leisure services. For more information on the impact of digitalisation on the measurement of the economy, see chapter 22.

Other intellectual property products

~~11.109~~11.123 *Other intellectual property products include any such products that constitute fixed assets but are not captured in one of the specific items above.*

2. **Changes in inventories (excluding natural capital)**

~~11.110~~11.124 Changes in inventories are measured by the value of the entries into inventories less the value of withdrawals and less the value of any recurrent losses of goods held in inventories during the accounting period. Some of these acquisitions and disposals are attributable to actual purchases or sales, but others reflect transactions that are internal to the enterprise.

~~11.111~~11.125 It is useful to distinguish between two functions performed by an enterprise: its function as a producer of goods and services and its function as an owner of assets. When a good is entered into inventories it is acquired as an asset by the enterprise in its capacity as owner either by purchase (or barter) or by an internal transaction with itself as the producer. Conversely, a good leaving inventories represents the disposal of an asset by the owner either by sale or other use, by an internal transfer to the producer or possibly as a result of recurrent losses (recurrent wastage, accidental damage or pilfering).

Storage and stocks of inventories

~~11.112~~11.126 Most goods going into inventories simply remain there until they are withdrawn in the same state as when they entered. Not infrequently, the price of the goods will have increased while they are in inventories, but these increases are not due to production but are simply holding gains. There are some goods,

though, where the passage of time in store changes the character of the goods. In such cases, the increase in value due to storage is to be treated as production and not as holding gains, though holding gains (or losses) may occur as well.

~~11.113~~11.127 The indication that storage is being undertaken as a production activity is that the price of the good stored, relative to the general level of prices, is expected to increase by a certain amount over a predetermined time. For example, winter wheat may be expected, on the basis of past experience, to fetch a given multiple of its price at harvest. Similarly, wine that is several years old is more valuable than the current year's vintage by a predictable factor.

~~11.114~~11.128 The activity of storage may be undertaken by any institutional unit, not just the original producer of the product or may be undertaken by several units in succession if the ownership of the goods changes during storage.

~~11.115~~11.129 The goods in storage are classified as work-in-progress and not finished goods. The increase in value during the accounting period up to the expected level at that time is treated as production of storage; any difference from this level is treated as a holding gain or loss. The method of valuing storage is described in the annex to chapter 67. The expected level of price increase for items being stored for more than one year, though, needs to be calculated in accordance with the principles of valuing work-in-progress described below.

Valuation

~~11.116~~11.130 The enterprise in its capacity as a producer may obtain goods or services for intermediate consumption either by purchasing them on the market for immediate use or by internal transfers out of inventories. In order to ensure that all the goods and services used for intermediate consumption are consistently valued at current prices, the goods transferred out of inventories are valued at purchasers' prices current at the time of the withdrawal from inventories.

~~11.117~~11.131 Similarly, the output produced by the producer may either be sold or otherwise disposed of or be transferred to inventories as finished products or work-in-progress. In order to ensure that output is consistently valued, finished goods transferred into inventories are valued as if they were sold at that time, while additions to work-in-progress are given the value they have at the time they are added to inventories.

Table ~~10.3~~11.3: The capital account - changes in inventories and valuables

Valuation of work-in-progress

~~11.118~~11.132 Much work-in-progress is of short duration and occurs only because production is a continuous process and some goods will be incomplete at the end of one accounting period but will be completed long before the end of the next. For output with a production period of a year or less, and assuming that prices and costs remain stable during the period of production, the value of the additions to work-in-progress for non-agricultural products within a given accounting period can be approximated by calculating the proportion of the total production costs incurred in that period and applying that ratio to the basic price realized by the finished product. Thus, the value of the output of the finished product is distributed over the accounting periods in which it was produced in proportion to the costs incurred in each period. If the average levels of prices and costs change from period to period, the output should be allocated initially using the prices and costs at the time the production is finished, and then the values of the work-in-progress thus calculated for earlier periods should be recalculated in proportion to the change in average cost levels from period to period.

~~11.119~~11.133 For agricultural products, this method of allocating output over multiple periods may not be satisfactory. A disproportionate share of the costs may be incurred in sowing a crop with little if any costs being incurred until harvest. Prorating the output to the physical growth of the crop may be considered a possibility but in cases where there is serious risk of climatic damage just before the crop is harvested, this may give over-optimistic indications of probable output. Pragmatic distributions over quarters based on past experience may have to be used, or where multi-cropping is the norm, to allow the whole output of each crop to be counted in the period when it is harvested.

~~11.120~~11.134 There are important activities, such as construction of buildings, structures and complex machinery, where the production process may take several years. In these cases, the valuation of the partially complete product requires careful consideration especially since such large projects are by their nature very costly.

~~11.124~~11.135 Even if one fifth of the work involved is put in place annually over a period of five years, it does not follow that one fifth of the value (assuming zero inflation for simplicity) should be recorded in each year. The work put in place in the first year cannot be used for four more years and so the value of it must be discounted to allow for this delay. In the second year, the value of the work put in place in the first year will increase by one discount factor and this should be added to the value of the work put in place in the second year and so on. This case is discussed in more detail in chapter ~~20~~17.

Transactions in inventories

~~11.122~~11.136 The transactions in the capital account relating to inventories show the change in the level of inventories of each type. The changes comprise the additions less withdrawals and less regular losses from inventories. Table ~~10~~11.3 shows the expansion of table ~~10~~11.1 to incorporate changes in inventories. Each of the categories is described and defined below.

Materials and supplies

~~11.123~~11.137 ***Materials and supplies consist of all products that an enterprise holds in inventory with the intention of using them as intermediate inputs into production.*** Not all necessarily get used in this way, however, as some may be lost as a result of physical deterioration, or recurrent accidental damage or pilfering. Such losses of materials and supplies are recorded and valued in the same way as materials and supplies actually withdrawn to be used up in production.

~~11.124~~11.138 Enterprises may hold a variety of quite different kinds of goods under the heading of materials and supplies, the most common types being fuels, industrial raw materials, agricultural materials, semi-processed goods, components for assembly, packaging materials, foodstuffs, office supplies, etc. Every enterprise, including non-market producers owned by government units, may be expected to hold some inventories of materials and supplies, if only inventories of office supplies.

~~11.125~~11.139 Materials and supplies do not include works of art or stocks of precious metals or stones acquired by enterprises as valuables. However, there are some producers that do use gold, diamonds, etc. as intermediate inputs into the production of other goods or services, for example, manufacturers of jewellery or dentists. Stocks of gold, diamonds, etc., intended for use in production are recorded under materials and supplies.

Work-in-progress

~~11.126~~11.140 ***Work-in-progress consists of output produced by an enterprise that is not yet sufficiently processed to be in a state in which it is normally supplied to other institutional units.*** Work-in-progress occurs in all industries, but is especially important in those in which some time is needed to produce a unit of finished output, for example, in agriculture, or in industries producing complex fixed assets such as ships, dwellings, software or films. Work-in-progress can therefore take a wide variety of different forms ranging from growing crops to partially completed film productions or computer programs. Although work-in-progress is output that has not reached the state in which it is normally supplied to others, its ownership ~~is~~may nevertheless be transferable, if necessary. For example, the ownership of a partially completed asset may be transferred to the ultimate owner, or it may be sold under exceptional circumstances such as the liquidation of the enterprise.

~~11.127~~11.141 Work-in-progress must be recorded for any output that is not complete at the end of the accounting period. This is a particular problem for output taking a long time to complete, such as construction. The shorter the accounting period, the more important work-in-progress is likely to be relatively to finished output. In particular, it is likely to be more significant for quarterly accounts than annual accounts, if only

because the production of many agricultural crops is completed within a year but not necessarily within a quarter. ~~The only exceptions to recording i~~Incomplete work ~~is recorded~~ as work-in-progress ~~are~~ for partially completed projects for which the ultimate owner is deemed to have taken ownership, either because the production is for own use or as evidenced by the existence of a contract of sale or purchase.

~~11.128~~11.142 ___ Reductions in work-in-progress take place when the production process is completed. At that point, all work-in-progress is reclassified as a finished product. This reclassification appears in the other changes in the volume of assets account.

~~11.129~~11.143 ___ If prices and costs have risen, work-in-progress carried forward from previous periods must be revalued using the prices and costs of the period in which the production is finished.

~~11.130~~11.144 ___ Current losses from work-in-progress resulting from physical deterioration or recurrent accidental damage or pilfering should be deducted from the additions to work-in-progress accruing as a result of the production carried out in the same period.

~~11.131~~11.145 ___ Work-in-progress ~~can be~~ subdivided between work-in-progress on cultivated ~~assets~~biological resources, as discussed under natural capital, and other work-in-progress, ~~as defined below~~. ***Other work-in-progress consists of output (other than on cultivated biological resources) that is not yet sufficiently processed to be in a state in which it is normally supplied to other institutional units.***

~~11.132~~ *Other work in progress*

~~11.133~~ ___

Finished goods

~~11.134~~11.146 ___ Finished goods consist of goods produced as outputs that their producer does not intend to process further before supplying them to other institutional units. A good is finished when its producer has completed his intended production process, even though it may subsequently be used as an intermediate input into other processes of production. Thus, inventories of coal produced by a mining enterprise are classified as finished products, although inventories of coal held by a power station are classified under materials and supplies. Inventories of batteries produced by a manufacturer of batteries are finished goods, although inventories of the same batteries held by manufacturers of vehicles and aircraft are classified under materials and supplies.

~~11.135~~11.147 ___ Inventories of finished goods may be held only by the enterprises that produce them. Finished goods entering inventories are valued at the basic prices of those goods at the times the entries take place; finished goods withdrawn from inventories are valued at the basic prices at the time when their withdrawals take place. Current losses of finished goods resulting from physical deterioration or recurrent accidental damage or pilfering should be valued at the prices at the time when the losses occur.

Military inventories

~~11.136~~11.148 ___ Military inventories consist of single-use items, such as ammunition, missiles, rockets, bombs, etc., delivered by weapons or weapons systems. As noted above in the discussion of weapons systems as fixed capital, most single-use items are treated as inventories but some types of missiles with highly destructive capability may be treated as fixed capital because of their ability to provide an ongoing deterrence service against aggressors.

Goods for resale

~~11.137~~11.149 ___ Goods for resale are goods acquired by enterprises, such as wholesalers or retailers, for the purpose of reselling them to their customers. Goods for resale are not processed further by the enterprises that purchase them, except for presenting them for resale in ways that are attractive to their customers. Thus, goods for resale may be transported, stored, graded, sorted, washed, packaged, etc. by their owners but are not otherwise transformed.

~~11.138~~11.150 Goods for resale entering the inventories of the enterprises are valued at their actual or estimated purchasers' prices. These prices include any additional transportation charges paid to enterprises other than the suppliers of the goods, but not the costs of any transport services produced on own account by the enterprise taking delivery. In principle, goods acquired by barter are valued at their estimated purchasers' prices at the time of acquisition. However, because there are no taxes or margins on bartered goods, the purchaser's price is the same as the basic price.

~~11.139~~11.151 Goods for resale withdrawn from inventories are valued at the purchasers' prices at which they can be replaced at the time they are withdrawn as distinct from the purchasers' prices that may have been paid for them when they were acquired. Reductions in inventories are valued in this way whether the goods withdrawn are sold at a profit or at a loss, or even not sold at all as a result of physical deterioration or recurrent accidental damage or pilfering.

~~11.140~~11.152 By convention, goods acquired by government for distribution as social transfers in kind but that have not yet been so delivered are also included in goods for resale.

3. Acquisitions less disposals of valuables

The asset boundary

~~11.144~~11.153 Valuables include precious metals and stones, antiques and other art objects and other valuables. However, not all items that may be described by one of these titles should necessarily be included as a valuable in the balance sheet of the owner. The intent of the heading is to capture those items that are often regarded as alternative forms of investment. At various times, investors may choose to buy gold rather than a financial asset and pension funds have been known to buy "old master" paintings when the prices of financial assets were behaving in a volatile manner. Individuals (households in SNA terminology) may also choose to acquire some of these items knowing that they may be sold if there is a need to raise funds.

Valuation

~~11.142~~11.154 Costs of ownership transfer, such as valuers' and auctioneers' margins, are often incurred when valuables are exchanged. As with other non-financial assets, these costs are treated as gross capital formation and included in the value of the items when recorded in the balance sheet.

Transactions in valuables

~~11.143~~11.155 A possible categorization of valuables is: precious metals and stones; antiques and other art objects; and other valuables. This list should be regarded as indicative and supplementary rather than a standard breakdown. The context of each category is described to assist in identifying and valuing valuables.

Precious metals and stones

~~11.144~~11.156 Precious metals and stones are treated as valuables when they are not held by enterprises for sale or use as inputs into processes of production nor are held as monetary gold and are not held as a financial asset in the form of unallocated metal accounts.

Antiques and other art objects

~~11.145~~11.157 Paintings, sculptures, etc., recognized as works of art and antiques are treated as valuables when they are not held by enterprises for sale. In principle, museum exhibits are included under valuables.

Other valuables

~~11.146~~11.158 Other valuables not elsewhere classified include such items as collections of stamps, coins, china, books etc. that have a recognized market value, ~~and~~ fine jewellery, fashioned out of precious stones, and metals of significant and realizable value. It may also include non-fungible tokens (NFTs) that only allow for personal use of another product or asset (usually a digital valuable). Some of these NFTs may initially be recorded as final consumption expenditure, but over time gain more features of a valuable. NFTs that grant limited commercial rights are recorded as part of contracts, leases and licences; see paragraph 11.170.

C. Acquisitions less disposals of non-produced non-financial assets (excluding natural capital)

~~11.147~~11.159 Excluding non-produced natural capital (see section D), there are three distinct types of non-produced non-financial assets in the SNA: ~~natural resources,~~ contracts, leases and licences, crypto assets without a corresponding liability designed to act as a medium of exchange, and purchased goodwill and marketing assets. These three types of assets have little in common except that they are all non-produced and non-financial. A separate section discusses each of the three.

~~11.148~~11.160 Table ~~10.11.4~~ shows table ~~10.11.1~~ expanded to show the standard detail of non-produced non-financial assets. Each of the categories is discussed under the appropriate section.

Table ~~10.4~~11.4: The capital account - non-produced non-financial assets

1. Contracts, leases and licences (excluding natural capital)

The asset boundary

~~11.149~~11.161 Contracts, leases and licences are treated as assets only when both the following conditions are satisfied.

- a. *The terms of the contract, lease or licence specify a price for the use of an asset or provision of a service that differs from the price that would prevail in the absence of the contract, lease or licence.*
- b. *One party to the contract must be able legally and practically to realize this price difference.*

The second condition presupposes that a market for the contract exists. It is recommended that in practice contracts, leases and licences should only be recorded in the accounts when the holder does actually exercise the right to realize the price difference.

~~11.150~~11.162 Part 5 of eChapter 2717 discusses the whole question of the treatment of leases within the integrated framework of national accounts SNA and should be consulted if there is doubt about whether a contract, lease or licence should be treated as an asset.

~~11.151~~11.163 As with natural resources, ~~†~~The costs of ownership transfer on the acquisition and disposal of contracts, leases and licences should be shown separately as gross capital formation.

Types of assets included in contracts, leases and licences

~~11.152~~11.164 There are four classes of contracts, leases and licences considered to be assets in the SNA: marketable operating leases, ~~permits to use natural resources,~~ permits to undertake specific activities, ~~and~~ entitlement to future goods and services on an exclusive basis, and non-fungible tokens.

Marketable operating leases

~~11.153~~11.165 Marketable operating leases are third-party property rights relating to fixed assets. An example is where a tenant of a building has a fixed rental but the building could fetch a higher rental in the absence of the lease. If, in these circumstances, the tenant is able both legally and practically to sublet the building, then he has an asset of the type of a marketable operating lease.

Permits to undertake specific activities

~~11.154~~11.166 A permit to undertake a specific activity is one where:

- a. the permits are limited in number and so allow the holders to earn monopoly profits,*
- b. the monopoly profits do not come from the use of an asset belonging to the permit-issuer,*
- c. a permit holder is able both legally and practically to sell the permit to a third party.*

Such permits are issued mainly by government but may also be issued by other units.

~~11.155~~11.167 When governments restrict the number of cars entitled to operate as taxis or limit the number of casinos permitted by issuing licences, they are in effect creating monopoly profits for the approved operators and recovering some of the profits as the fee. The incentive to acquire such a licence is that the licensee believes that he will thereby acquire the right to make monopoly profits at least equal to the amount ~~he~~that was paid for the licence. This stream of future income is treated as an asset if the licensee can realize this by on-selling the asset. The type of asset is described as a permit to undertake a specific activity. The value of the asset is determined by the future stream of monopoly profits.

~~11.156~~11.168 It is less common for units other than government to be able to limit the participation in a given activity. One instance may be where the owner of property limits the numbers of units allowed to operate on ~~the his~~ property, for example a hotel with a policy of only allowing one taxi firm to pick up guests. In this sort of case, the permits are treated as giving rise to payments for services. There is no reason in principle why such permits could not be treated as assets if they were marketable though this may not be a common situation.

Entitlement to future goods and services on an exclusive basis

11.169 *Entitlement to future goods and services on an exclusive basis relates to the case where one party which has contracted to purchase goods or services at a fixed price at a time in the future is able to transfer the obligation of the second party to the contract to a third party.* Examples are footballers' contracts, a publisher's exclusive right to publish new works by a named author or issue recordings by named musicians.

Non-fungible tokens

~~11.157~~11.170 Non-fungible tokens relate to digital records hosted on a blockchain that are associated with a digital or physical asset or product but that are distinct from that asset or product. In some cases, these non-fungible tokens grant limited commercial rights from which the owner can derive economic benefits (e.g., some form of royalties). These tokens should be recorded as non-produced non-financial assets. Acquisitions of these assets should be valued at their exchange values.

2. Crypto assets without a corresponding liability designed to act as a medium of exchange

11.171 Crypto assets without a corresponding liability designed to act as a medium of exchange are crypto assets for which there is no issuer. They consist of crypto assets without a corresponding liability designed to act as a general medium of exchange and those designed to act as medium of exchange within a platform only. Different from similar assets issued by, for example, a central bank, crypto assets without a corresponding

liability are recorded as non-produced non-financial assets, and not as financial assets, mainly because a counterpart liability cannot be established. In addition, it can be noted that many of these crypto assets do not yet act as a medium of exchange; instead they are often looked upon as a store of value.

11.172 The recording as non-produced non-financial assets means that purchases of goods or services using these assets are considered to be barter transactions. The valuation of these transactions, similar to direct acquisitions or disposals of crypto assets, can be determined by the market price of the relevant crypto assets at the date of exchange.

11.173 Crypto assets more generally are a relatively new phenomenon, certainly at the time of writing these standards. As a consequence, the role of crypto assets without a counterpart liability designed to act as a medium of exchange may change in the future, and such crypto assets may qualify as money, to be recorded as financial assets. Important conditions for such a classification are that these assets are (i) authorised by government, (ii) generally accepted as a means of payments, including paying taxes with such assets; (iii) serving as a unit of account; and (iv) widely used as a medium of exchange. In respect of these future developments, the classification of crypto assets without a counterpart liability designed to act as a medium of exchange has been put on the research agenda (see Annex 5)

2.3. Purchased Goodwill and marketing assets

~~11.158~~11.174 Potential purchasers of an enterprise are often prepared to pay a premium above the net value of its individually identified and valued assets and liabilities. This excess is described as “goodwill” and reflects the value of corporate structures and the value to the business of an assembled workforce and management, corporate culture, distribution networks and customer base. It may not have value in isolation from other assets, but it enhances the value of those other assets. Looked at another way, it is the addition to the value of individual assets because they are used in combination with each other.

~~11.159~~11.175 Purchased Goodwill cannot be separately identified and sold to another party. The value has to be derived by deducting from the sale value of the corporation the value of assets and liabilities classified elsewhere within the asset boundary of the SNA. (In practice, since it is estimated as a residual, an estimate of goodwill will also reflect errors and omissions in the valuation of other assets and liabilities.)

~~11.160~~11.176 As well as residual errors, the value of purchased goodwill may include the value to the corporation of items known as marketing assets. ***Marketing assets consist of items such as brand names, mastheads, trademarks, logos and domain names.*** A brand can be interpreted as far more than just a corporate name or logo. It is the overall impression a customer or potential customer gains from their experience with the company and its products. Interpreted in that wider sense it can also be seen to encompass some of the characteristics of goodwill such as customer loyalty.

~~11.161~~11.177 The value of purchased goodwill and marketing assets is defined as the difference between the value paid for an enterprise as a going concern and the sum of its assets less the sum of its liabilities, each item of which has been separately identified and valued. Although goodwill is likely to be present in most corporations, for reasons of reliability of measurement it is only recorded in the integrated framework of national accountsSNA when its value is evidenced by a market transaction, usually the sale of the whole corporation. Exceptionally, identified marketing assets may be sold individually and separately from the whole corporation in which case their sale should also be recorded under this item.

D. Acquisitions less disposals of natural capital

11.178 Natural capital consists of two distinct classes of assets: natural resources and ecosystem assets. The former are recognised in the integrated framework of national accounts, and the latter are not.

11.179 Natural resources are assets that naturally occur, such as land, water resources, timber and fish stocks, and mineral and energy resources that have an economic value and over which ownership may be enforced and transferred (see below for a more detailed discussion). In monetary terms, the asset boundaries of the SEEA 2012 Central Framework and the integrated framework of national accounts are the same. In physical terms, the asset boundary of the SEEA 2012 Central Framework is broader and includes all natural resources and

areas of land of an economic territory that may provide resources and space for use in economic activity. Thus, the scope in physical terms is not limited to those assets with economic value.

11.180 Ecosystem assets are contiguous spaces of a specific ecosystem type characterized by a distinct set of biotic and abiotic components and their interactions, from which benefits can be derived that are used in economic and other human activity. Ecosystem assets are not recognised in the system of national accounts, mainly because no monetary benefits can be derived from them. An exception may be related to certain provisioning types of services which result in monetary benefits and as such may be implicitly included in the value of natural resources, such as agricultural land or forest land. Ecosystem assets are at the heart of SEEA Ecosystem Accounting.

11.181 For more information on ecosystem assets, and accounting for environmental sustainability more generally, see chapter 35 and the two SEEA standards.

~~11.162~~11.182 In the integrated framework of national accounts, natural resources are broken down into five asset categories: (i) land; (ii) mineral and energy resources; (iii) biological resources; (iv) water resources; and (v) other natural resources. In the discussion below, a distinction is made between biological resources and the other types of natural resources. The main reason for this is that biological resources are a mixture of produced and non-produced assets, while the other categories exclusively consist of non-produced non-financial assets.

1. Land, mineral and energy resources, water resources and other natural resources

The asset boundary

~~11.163~~11.183 As noted before, ~~N~~not all environmental ~~resources~~assets qualify as economic assets. It is useful, therefore, to delineate those naturally occurring resources that fall within the asset boundary of the integrated framework of national accountsSNA from those that do not.

~~11.164~~11.184 In the first place, it must be noted that the accounts and balance sheets of the integrated framework of national accountsSNA are compiled for institutional units or groups of units and can only refer to the values of assets that belong to the units in question. Only those naturally occurring resources over which ownership rights have been established and are effectively enforced can therefore qualify as economic assets and be recorded in balance sheets. They do not necessarily have to be owned by individual units, and may be owned collectively by groups of units or by governments on behalf of entire communities. Certain naturally occurring resources, however, may be such that it is not feasible to establish ownership over them: for example, air, or the oceans. In addition, there may be others that cannot be treated as economic assets because they do not actually belong to any particular units. These include not only those whose existence is unknown but also those, ~~including uncultivated forests~~, that may be known to exist but remain so remote or inaccessible that, in practice, they are not under the effective control of any units.

~~11.165~~11.185 Secondly, in order to comply with the general definition of an economic asset, natural assets must not only be owned but must also be capable of bringing economic benefits to their owners, given the technology, scientific knowledge, economic infrastructure, available resources and set of relative prices prevailing on the dates to which the balance sheet relates or expected to do so in the near future. Thus, known deposits of minerals that are not commercially exploitable in the foreseeable future are not included in the balance sheets of the SNA, even though they may possibly become commercially exploitable at a later date as a result of major, unforeseen advances in technology or major changes in relative prices.

~~11.166~~11.186 In the case of mineral and energy resources, SEEA 2012 Central Framework distinguishes three classes based on the United Nations Framework Classification (UNFC) for Fossil Energy and Mineral Resources: class A: commercially recoverable resources; class B: potentially commercially recoverable resources; and class C: non-commercial and other known deposits. The measurement of monetary estimates is typically restricted to the first class, which in practice could be approximated by those resources for which permissions to exploit have been granted, and/or those for which the existence is explicitly recognised by (past) monetary transactions. Potential mineral and energy resources where it is not foreseen that they will be exploited in the near future are thus explicitly excluded.

Ownership of assets

~~11.167~~11.187 All owners and purchasers of land and immovable natural resources within the economic territory are deemed to have a centre of economic interest in the economy. If an owner or purchaser would not otherwise qualify as a resident unit, a notional resident unit is created for this purpose. The notional resident unit is deemed to purchase the land while the non-resident is deemed to purchase the equity of the notional unit and thus acquires a financial instead of a non-financial asset. 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 organization, purchases or sells land that is added to, or taken away from, the enclave in which its embassy or offices are located.

~~11.168~~11.188 Moreover, as purchases and sales of land and natural resources are recorded excluding costs of ownership transfer for both buyers and sellers, the total value of the purchases and sales of land and natural resources must be equal to each other at the level of the total economy, although not at the level of individual sectors or subsectors.

11.189 Similarly, it is assumed that extraction of subsoil resources can only be undertaken by resident institutional units. As soon as an enterprise starts to prepare to establish for extraction, for example by obtaining the requisite licences, it is assumed to become resident at that point.

11.190 In the case of mineral and energy resources, a government is often the legal owner of the resources. Once a decision is taken to extract the resources, a license is given to a user/extractor to exploit the resources. In return for the license, the extractor typically pays an annual rent to the government. Any payments made by the user/extractor of a natural resource to the owner of the natural resource, which are linked to the use/extraction of that resource, in particular to the quantity and/or value of that resource, should be recorded as rent. These would include, for example, royalties, sur-taxes, and permits. However, payments that are paid by the user/extractor on the same basis as other corporations who are not users/extractors of natural resources (e.g., standard rate corporation taxes, dividends, payments for services) should not be recorded as rent.

~~11.169~~11.191 The full resource rent can be estimated using the residual value method, by deducting from output all costs related to the extractions of the resources, including services related to the capital used in production (for more details, see the annex to chapter 4). The government often does not appropriate the full resource rent which can be derived from the exploitation of mineral and energy resources. If this is the case, the asset should be allocated to government and the extractor in line with the estimated appropriation of future resource rents. The coming into existence of the relevant resources is recorded as an other change in the volume of assets and liabilities, and is therefore not recorded on the capital account.

Valuation

~~11.170~~11.192 Since land, mineral and energy resources, water resources and the like~~natural resources~~ are non-produced, the costs of ownership transfer, which are part of fixed capital formation, must be shown separately in the capital account and not as part of the value of the transaction in the non-produced asset. For land, the costs of ownership transfer are treated, by convention, as being included with land improvements.

Transactions in natural resources

~~11.171~~11.193 Transactions in natural resources are shown as acquisitions less disposals of the asset in question, according to the classification given in table ~~40~~11.4.

Land

~~11.172~~11.194 ***Land 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.*** The value of land excludes any buildings or other structures situated on it or running through it; cultivated crops, trees and animals; mineral and energy resources; non-cultivated biological resources and water resources below the ground. The associated surface water includes 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. However, water bodies from which water is regularly extracted, against payment, for use in production (including for irrigation) are included not in water associated with land but in water resources.

~~11.173~~11.195 As explained above, land improvements and the costs of ownership transfer on land are treated as fixed assets and shown separately. In consequence, acquisitions and disposals of natural land are recorded at the same value for both the purchaser and the seller. Since both parties to the transaction must be residents, 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, although this is not generally true at lower levels of aggregation, such as individual sectors or subsectors. 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, as noted in paragraph 10.17011.186.

11.196 Buildings, or other structures, ~~and plantations~~ are often purchased or sold together with the land on which they are situated, without separate valuations being placed on the structures and the land. Even if it is not feasible to obtain separate valuations, as may be the case for existing structures, it may be possible to determine which out of the land or the structure accounts for most of their combined value and to classify the transaction as the purchase of land or of a structure depending upon which has the greater value. If it is not possible to determine whether the land or the structure is the more valuable, by convention, the transaction should be classified as the purchase of a structure, that is, as gross fixed capital formation. ~~A similar convention holds for plantations.~~

11.197 Similar considerations apply in the case of mineral and energy resources and biological resources. The value of land may be higher due to the availability of subsoil resources, or the possibility to exploit renewable energy by having permission to put, for example, wind turbines or fields of solar panels on the land. In addition to the relevant structures, the value will also be affected by the net present value of future resource rents derived from exploiting these mineral and energy resources. In the case of biological resources, it may also be difficult to delineate the value of land from the value of plantations yielding repeat products as well as from the net present value of future resource rents related to the exploitation of forests for timber production (excluding work-in-progress). In all these cases, the transaction should preferably be recorded in line with the asset classification. As this may show to be difficult to apply in practice, the transaction is to be recorded as a purchase of land or the purchase of a natural resource depending upon which has the greater value. If it is not possible to determine whether the land or the natural resource is the more valuable, by convention, the transaction should be classified as (the purchase of) land. In all cases, potential double-counting, under land as well as the relevant natural resource, should be avoided.

~~11.174~~11.198 The integrated framework of national accountsSNA does not specify a disaggregation of land but it is recommended that if a disaggregation is required, it should be according to that used in the SEEA.

Mineral and energy resources

~~11.175~~11.199 The first group of ~~M~~mineral and energy resources consists of non-renewable mineral and energy reserves located on or below the earth's surface that are economically exploitable, given current technology and relative prices. Ownership rights to the mineral and energy resources are usually separable from those to the land itself. Non-renewable Mmineral and energy resources consist of ~~known~~commercially recoverable reserves of coal, oil, gas or other fuels and metallic ores, and non-metallic minerals, etc., that are located below or on the earth's surface, including reserves under the sea. The transactions recorded in the capital account refer only to those mineral and energy resources over which ownership rights have been established. In most cases, mineral and energy resources may be owned separately from land below which they are located, but in other cases the law may stipulate that the ownership of the mineral and energy resources is inseparably linked to that of the land.

11.200 The second group of mineral and energy resources relates to renewable energy resources captured through the exploitation of wind, sun, etc. Although these resources as such are generally not scarce, the exploitation of these resources may be restricted to certain economic agents, for example by needing permissions to put wind turbines on land, or having ownership of particular pieces of land which are highly favourable for exploiting renewable resources.

11.201 The transactions in mineral and energy resources recorded in the capital account refer to acquisitions or disposals of ~~deposits of~~ mineral and energy resources in which the ownership of such assets passes from one institutional unit to another. In the case of the establishment of a license agreement between a legal owner (usually government) and a user/extractor to exploit natural resources, the user/extractor may appropriate part of the value of the assets. This is to be recorded as an other change in the volume of assets; see paragraph 11.190. Reductions in the value of known reserves of mineral and energy resources resulting from their depletion as a result of extracting the assets for purposes of production are ~~not also~~ recorded in the capital account, in line with the allocation of the relevant assets to the original owner and the extractor (see section E) but in the other changes in the volume of assets account. Depletion does not apply to renewable energy resources.

~~11.176~~11.202 Again if a disaggregation is required for certain types of analysis, it is recommended to ~~follow that in the SEEA distinguish the following categories of non-renewable energy resources: (i) oil and gas resources; (ii) coal resources; (iii) mineral resources and (iv) other non-renewable mineral and energy resources.~~ For renewable energy resources, the following breakdown is recommended: (i) wind energy resources; (ii) solar energy resources; (iii) water energy resources; (iv) geothermal energy resources; and (v) other renewable energy resources.

Water resources

~~11.177~~11.203 Water resources consist of surface and groundwater resources used for extraction to the extent that their scarcity leads to the enforcement of ownership or use rights, market valuation and some measure of economic control. If it is not possible to separate the value of surface water from the associated land, the whole should be allocated to the category representing the greater part of the total value.

Other natural resources

~~11.178~~11.204 The category other natural resources currently includes radio spectra. Given the increasing move to carry out environmental policy by means of market instruments, it may be that other natural resources will come to be recognized as economic assets. If so, this is the category to which they should be allocated.

2. Biological resources

The asset boundary

~~11.179~~11.205 Naturally occurring assets in the form of biota (trees, vegetation, animals, birds, fish, etc.) are renewable. The growth and regeneration of trees, crops or other vegetation or the rearing of animals, birds, fish, etc., may take place under the direct control, responsibility and management of institutional units. In this situation, the assets are cultivated, and the activity is treated as falling within the production boundary of the integrated framework of national accounts^{SNA}. The growth of animals, birds, fish, etc., living in the wild, or growth of uncultivated vegetation in forests, is not an economic process of production so that the resulting assets cannot be classed as produced assets. Nevertheless, when these uncultivated biological resources ~~forests or the animals, birds, fish, etc.~~ are actually owned by institutional units and are a source of benefit to their owners, they constitute economic assets. When wild animals, birds, fish, etc. live in locations such that no institutional unit is able to exercise effective ownership rights over them they fall outside the asset boundary. Similarly, the forests or other vegetation growing in such regions are not counted as economic assets. On the other hand, fish stocks in the high seas which are subject to international agreement on how much may be caught by individual countries may be counted as falling within the asset boundary.

11.206 In practice, it may be difficult to make a clear distinction between cultivated and non-cultivated biological resources. Here, the treatment of biological resources yielding repeat products (breeding stocks, dairy cattle, fruit trees, etc.) is more straightforward than the treatment of certain biological resources yielding once-only products. The former resources generally take place under the direct control, responsibility and management of institutional units, and are treated as assets, apart from some rather insignificant resources, such as wild shrubs for berry picking. Some biological resources yielding once-only products are also easy to classify as

being under the direct control, responsibility and management of institutional units, the most obvious examples being animals for slaughter and plants and crops which are produced on farms (including fish farms).

~~11.180~~11.207 The distinction between cultivated and non-cultivated biological resources becomes more complicated for biological resources yielding once-only products that are often not directly owned by individual institutional units. In these cases, it is recommended to distinguish between resources where the control, responsibility and management does not go beyond the establishment of quota regimes (e.g. migrating wild animals and fish in open waters) versus resources where one can observe a continuum from intensive to extensive forms of control, responsibility and management (e.g., the growth of trees for timber production). In the latter case, ownership rights are usually in place. The relevant assets may not be owned by individual economic agents, but in those cases a government typically exerts collective ownership. It is recommended to treat these resources as cultivated assets, with all growth of trees which in the future are intended to be used for the purpose of producing timber considered as being established under some form of human involvement, instead of applying a discretionary choice between either managed and controlled or not managed and controlled by economic agents. In the former case if assets where the human involvement does not go beyond the establishment of quota regimes, the resources are typically treated as non-cultivated assets.

Ownership of assets

~~11.181~~11.208 Ownership of assets is generally clear, with the exception of biological resources yielding once-only products that are often not directly owned by individual institutional units. In these cases, it is recommended to allocate the assets to the legal owner and the exploiter of the resources in line with the appropriation of future resource rents, similar to the recording of non-renewable mineral and energy resources.

Valuation

11.209 The valuation of transactions in biological resources can generally be based on the actual exchange values. For biological resources yielding once-only products that are often not directly owned by individual institutional units, transactions usually do not take place, unless rights to exploit the resources are transacted. Here, one can distinguish three cases: (i) the owner may permit the resource to be used to extinction; (ii) the owner may allow the resource to be used for an extended period of time in such a way that in effect the user controls the use of the resource during this time with little if any intervention from the legal owner; and (iii) the owner can extend or withhold permission to continued use of the asset from one year to the next. When the resource access rights are freely traded, it is possible to estimate the value of the relevant biological resource from the market prices of the rights. The economic logic parallels the residual value method, since it is expected that, in a free market, the value of the rights should be equivalent to the future returns from the biological resource (after deducting all costs, including the services related to capital used in production). Moreover, if the access rights provide very long term or indefinite access to the assets, the market value of these rights may provide a direct estimate of the total value of the underlying asset.

~~11.182~~11.210 However, in practice, in many cases governments may give the access rights to extractors for free or do so at a price that is less than the true market value. Further, trading of the rights may be restricted or prohibited. In these cases, there is no directly observable market valuation, and the net present value of future resource rents should be used. The establishment of license arrangements or quota regimes, including the related appropriation of future resource rents, would be recorded as other changes in volume of assets and liabilities, unless the relevant assets are actually transacted. In the latter case of the assets being transacted, the price paid may also be well below the net present value of future resource rents, because the rights are not traded in a free market, while trading is restricted or prohibited. In this case, the difference is to be recorded as a capital transfer from government to the one purchasing the resources. For more details, see chapter 27.

Cultivated biological resources yielding repeat products

~~11.183~~ 11.211 ~~Cultivated biological resources yielding repeat products are typically cultivated resources and cover both animal resources yielding repeat products and tree, crop and plant resources yielding repeat products, whose natural growth and regeneration are under the direct control, responsibility and management of institutional units.~~

~~11.184~~ 11.212 ~~In general, when the production of fixed assets takes a long time to complete, those assets whose production is not yet completed at the end of the accounting period are recorded as work-in-progress. This also holds for~~ However, when the assets are produced on own account, they are treated as being acquired by their users at the same time as they are produced and not as work in progress. These general principles also apply to the production of cultivated assets such as animals or trees that may take a long time to reach maturity. Two cases need to be distinguished from each other: the production of cultivated products by specialized producers, such as breeders or tree nurseries, and the own account production of cultivated assets by their users.

~~In the case of the specialist producers, animals or trees whose production is not yet complete and are not ready for sale or delivery are recorded as work in progress. Examples are one year old horses bred for sale as two year old race horses, or young fruit trees that need further growth before being marketable. Such work in progress is recorded and valued in exactly the same way as that originating in any other kind of production.~~

~~However, when animals or trees intended to be used as fixed assets are produced on own account by farmers or others, incomplete assets in the form of immature animals, trees, etc. that are not ready to be used in production are treated not as work in progress but as gross fixed capital formation by the producing unit in its capacity as eventual user.~~

Animal resources yielding repeat products

~~11.185~~ 11.213 ~~Animal resources yielding repeat products cover animals whose natural growth and regeneration are under the direct control, responsibility and management of institutional units.~~ They include breeding stocks, dairy cattle, draft animals, sheep or other animals used for wool production and animals used for transportation, racing or entertainment. Animals raised for slaughter, including poultry, are not included here ~~fixed assets but inventories~~. Immature cultivated assets yielding repeat products are recorded as work-in-progress ~~excluded unless produced for own use~~.

~~11.186~~ 11.214 ~~This heading may also includes~~ aquatic resources yielding repeat products, consisting of aquatic resources maintained for controlled reproduction. In all but exceptional cases, though, these will be small and may be ignored unless of significant importance.

~~11.187~~ 11.215 ~~Gross fixed capital formation in livestock that are cultivated for the products they yield year after year (dairy cattle, draught animals, etc.) is measured by the value of acquisitions less disposals, taking account of the treatment just described of immature livestock reared on own account.~~ It is therefore equal to the total value of all mature animals ~~and immature animals produced on own account~~ acquired by users of the livestock, including all mature animals produced on own account, less the value of their disposals. Disposals consist of animals sold or otherwise disposed of, including those sold for slaughter, plus those animals slaughtered by their owners. Exceptional losses of animals due to major outbreaks of disease, contamination, drought, famine, or other natural disasters are recorded in the other changes in the volume of assets account and not as disposals. Incidental losses of animals due to occasional deaths from natural causes form part of ~~consumption of fixed capital~~ depreciation. ~~Consumption of fixed capital~~ Depreciation of an individual animal is measured by the decline in its value as it gets older.

Tree, crop and plant resources yielding repeat products

~~11.188~~11.216 Tree, crop and plant resources yielding repeat products cover plants whose natural growth and regeneration are under the direct control, responsibility and management of institutional units. They include trees (including vines and shrubs) cultivated for fruits and nuts, for sap and resin and for bark and leaf products. Trees grown for timber that yield a finished product once only when they are ultimately felled are not fixed assets, just as cereals or vegetables that produce only a single crop when they are harvested cannot be fixed assets.

~~11.189~~11.217 Gross fixed capital formation in plantations, orchards, etc., consists of the value of the acquisitions less disposals of mature trees, shrubs, etc., including acquisitions of immature trees, shrubs, etc., produced on own account. As explained above, immature products are recorded as work-in-progress, the value of which the latter may be approximated, if necessary, by the value of costs incurred in their production during the period: for example, the costs of preparing the ground, planting, staking, protection from weather or disease, pruning, training, etc.; Once until the trees reaches maturity and starts to yield a product, they are transferred from work-in-progress to gross fixed capital formation. Disposals consist of trees, shrubs, etc., sold or otherwise transferred to other units plus those cut down before the end of their service lives. All agricultural output is at the mercy of the weather. Expected output must take account of normal variations in climatic conditions and exceptional losses should be confined to those outside recent past experience. Disposals do not include exceptional losses of trees due to drought or other natural disasters such as gales, or hurricanes or forest fires, these being recorded in the other changes in the volume of assets account.

Work-in-progress on cultivated biological resources yielding repeat products

11.218 Work-in-progress on cultivated biological resources yielding repeat products consists of output that is not yet sufficiently mature to be in a state in which it is normally supplied to other institutional units, or to be used in production. In the present context it is necessary to distinguish single-use plants, trees and livestock that produce an output once only (when the plants or trees are cut down or uprooted or the livestock slaughtered) from the relevant work-in-progress related to trees (including vines and shrubs) and livestock that are used repeatedly or continuously for more than one year to produce outputs such as fruit, nuts, rubber, milk, wool, power, transportation and entertainment. ~~Work in progress should be recorded for single use resources. For~~ The growth of repeat yield resources, being cultivated on own account, or under an agreed contract with another unit, ~~the growth is also counted as work-in-progress fixed capital formation and so excluded from inventories.~~ Any remaining cultivation of resources with repeat yields should be included in work-in-progress. This may be the case for nurseries and breeders of race horses or other special animals, for example.

Cultivated biological resources yielding once-only products, including work-in-progress

11.219 Leaving apart the farming of single-use plants and livestock that produce an output once only, cultivated biological resources yielding once-only products mainly consist of non-migrating resources, the most prominent example being the growth of trees for timber production. As noted before, for this type of resources no distinction is made between cultivated and non-cultivated resources. For those resources over which (collective) ownership can be enforced, all growth of trees intended to be used for the purpose of producing timber is considered as being under some degree of human management and control. Possible benefits derived from the growth of trees not intended for future timber production are not given rise to the recognition of assets.

11.220 Two types of assets need to be considered and estimated for this type of cultivated biological resources yielding once-only products: the underlying asset, i.e., the forest land, and the work-in-progress representing the growth of trees. Market prices for forest land are usually not available, and need to be approximated using the net present value of future benefits, after deduction of the value of the work-in-progress (see chapter 14). Any increase in the volume of this underlying asset, which is the result of an increase in the regenerative potential of the forest land, is to be recorded as gross fixed capital formation. Any decline in this regenerative potential should be recorded as depreciation.

11.221 Work-in-progress related to cultivated biological resources yielding once-only products represents the accrual accounting of the growth of trees intended for the future production of timber. A distribution of output

over the accounting periods of the growth of the trees in proportion to the costs incurred may not provide satisfactory results when looking at individual generations of trees, as a disproportionate share of the costs may be incurred in the beginning and the end of the period of growth. Given the fact that the growth of trees is a more or less continuous process, with a forest typically consisting of trees in different age categories, an equal distribution of the growth over the life-length of the trees is considered a good approximation. Due to the considerable time it takes before a tree is mature enough for timber production, it is important, however, that the growth of the trees in subsequent periods is appropriately discounted. For the farming of single-use plants and livestock which take more time to mature than the reference period (quarter, year), the guidance for the recording and estimation of work-in-progress is similar to that for other products; see section B2 of this chapter.

Non-cultivated biological resources

~~11.190~~11.222 Non-cultivated biological resources consist of animals, birds, fish and plants that yield both once-only and repeat products over which ownership rights, often collectively by government, are enforced but for which natural growth or regeneration is not under the direct control, responsibility and management of institutional units. Examples are virgin forests and fisheries within the territory of the country. Only those resources that are currently, or are likely soon to be, exploitable for economic purposes should be included. In practice, these resources are restricted to migrating biological resources, such as fish in open seas, which are subject to some form of quota regime.

In the SEEA, this category is further split into aquatic resources, animal resources other than aquatic resources, tree, crop and plant resources. Aquatic resources are further split into aquatic resources in national waters including the exclusive economic zone (EEZ) and those in the high seas.

————— *Permits to use natural resources*

Permits to use natural resources are third-party property rights relating to natural resources. An example is where a person holds a fishing quota and he is able, again both legally and practically, to sell this to another person.

E. Consumption of fixed capital Depreciation and depletion

~~11.191~~11.223 The concept of consumption of fixed capital depreciation and depletion has been is first described and defined in chapter 76 in connection with the difference between gross and net value added and then carries through all subsequent balancing items that may also be shown gross or net of consumption of fixed capital depreciation and depletion. The capital account is where the counterpart entries to the entries in the production account appears though unusually they appear on the same side as in the production account but with a negative sign rather than on the opposite side of the account.

1. Depreciation

~~11.192~~11.224 Consumption of fixed capital Depreciation constitutes a negative change in the value of the fixed assets used in production. Consumption of fixed capital Depreciation must be measured with reference to a given set of prices, that is, the average prices of the type of asset of constant quality over the period. It may then be defined as the decline, between the beginning and the end of the accounting period, in the value of the fixed assets owned by an enterprise, as a result of their physical deterioration and normal rates of obsolescence and accidental damage. Consumption of fixed capital Depreciation may be deducted from gross fixed capital formation to obtain net fixed capital formation to match the balancing item of net saving carried

down from the use of income account.

~~11.193~~11.225 ~~Consumption of fixed capital~~ Depreciation applies to all fixed assets and for every year the asset is in use in production. Because costs of ownership transfer are treated as fixed assets, including terminal costs, they are also subject to ~~consumption of fixed capital~~ depreciation. All buildings and other structures are assumed to have finite service lives, even when properly maintained, so that ~~consumption of fixed capital~~ depreciation is calculated for all such fixed assets, including railways, roads, bridges, tunnels, airports, harbours, pipelines, dams, etc. Service lives are not determined purely by physical durability, and many pieces of equipment as well as buildings and structures are eventually scrapped because they have become obsolete. However, the service lives for some structures such as certain roads, bridges, dams, etc., may be as long as a century or more.

Costs of ownership transfer

~~11.194~~11.226 The costs of ownership transfer on the acquisition and disposal of a fixed asset are treated as gross fixed capital formation and included in the value of the asset on acquisition and disposal as recorded in the capital account and in the value of the asset in the balance sheet. However, although ~~consumption of fixed capital~~ depreciation is calculated on the value of the asset excluding the costs of ownership transfer over the whole of its life, the ~~consumption of fixed capital~~ depreciation in respect of the costs of ownership transfer is calculated only over the period that the owner expects to hold the asset. In this way there are no remaining costs of ownership transfer included in the value of the asset when it is sold to a new owner, so the amount the old owner receives is equal to the amount the new owner pays except for any costs of ownership transfer incurred by the new owner.

~~11.195~~11.227 In the case of natural resources other than land, the costs of ownership transfer are shown as transactions in gross fixed capital formation in the capital account separately from the acquisition and disposal of natural resources, but the value of the natural resources in the balance sheet includes the value of the costs of ownership transfer. The costs of ownership transfer are still written off according to the expected length of time the owner will hold the asset and treated as ~~consumption of fixed capital~~ depreciation in the relevant production account.

~~11.196~~11.228 In the case of land, costs of ownership transfer are treated as a part of land improvement, which is itself treated as a produced asset. The value of land improvements other than the costs of ownership transfer is written off over a suitably long period but the costs of ownership transfer are written off over the period the owner expects to own the land.

Terminal costs

~~11.197~~11.229 In principle, the value of ~~consumption of fixed capital~~ depreciation cumulated over the life of an asset, once price changes are taken into account, should be equal to the difference between the acquisition and disposal values. In the case of assets with actual costs at the time of disposal, this means that ~~consumption of fixed capital~~ depreciation should cover anticipated terminal costs. Terminal costs should therefore be written off over the whole life of the asset, regardless of the number of owners during the life of the asset. To avoid a negative value of the asset at the end of its life, the expected terminal costs are added to the value of the asset at the time the asset enters the balance sheet, with a counterparty entry of provisions at the liability side, both to be recorded in the other changes in the volume of assets and liabilities accounts. At the end of the life of the asset, the actual investment expenditures on terminal costs, which lead to a positive change in the value of the asset, are counterbalanced with a reversal of the flows in the beginning of the period, i.e., a decline in the value of assets with a concomitant decline of the related provisions, again recorded as other changes in the volume of assets and liabilities. Immediately before the disposal, the value of the asset will have a negative value which is reduced to zero when the terminal costs incurred are treated as gross fixed capital formation. The apparent oddity of an asset with negative value reflects the fact that the owner not only could not sell it but would have to pay another unit to take over responsibility for the asset.

~~11.198~~11.230 In practice, it may be difficult to predict terminal costs accurately. In that case, cumulated ~~consumption of fixed capital~~ depreciation may not cover all the terminal costs. However, the full costs are

still treated as gross fixed capital formation and any amount not already covered by ~~consumption of fixed capital depreciation~~ during the life of the asset is written off at the time the costs are incurred as ~~consumption of fixed capital depreciation~~. This is a pragmatic recommendation and will lead to NDP being overstated over the time the asset is in use and understated in the year when the remaining costs are incurred.

~~11.199~~11.231 There is further discussion on the treatment of costs of ownership transfer and terminal costs in chapter ~~20~~17.

2. Depletion

11.232 In physical terms, depletion refers to the decrease in the quantity or value of the stock of a non-produced natural resource over an accounting period that is due to the extraction of the natural resource by economic units occurring at a level greater than that of regeneration. In monetary terms, it corresponds with the decline in future income, due to extraction, that can be earned from a resource, the value of which is based on the physical flows of depletion using the price of the natural resource in situ.

11.233 For non-renewable mineral and energy resources, depletion is confined to the decrease of the value on the natural resource due to extraction. Other changes in value, such as those related to the discoveries and upward and downward reappraisals are recorded as other changes in the volume of assets and liabilities. The same holds for transfers of natural resources out of economic activity because of changing technology, or reduced demand for the resulting output or for legislative reasons. However, the stranding of these assets is to be recorded as revaluations. For more details, see chapter 13.

~~11.200~~11.234 Land in its natural state and renewable energy resources are not subject to depletion. However, in the case the value of land is combined with another asset, the combined asset may be subject to depreciation or depletion. For non-cultivated biological resources yielding once-only products, a decline in the regenerative potential of the underlying asset (e.g., the case where the extraction of fish in open seas is larger than its natural growth) is to be recorded as depletion. A growth in the regenerative potential is to be recorded as negative depletion. In the case of cultivated biological resources yielding once-only products, the growth and decline of the regenerative potential of the underlying asset (e.g., forest land in the case of the growth of trees for the production of timber) is to be recorded as gross fixed capital formation and depreciation, respectively. Biological resources yielding repeat products are typically classified as fixed assets, and the decline as a result of their physical deterioration and normal rates of obsolescence and accidental damage should be recorded as part of depreciation.

F. Capital transfers

1. Capital versus current transfers

~~11.201~~11.235 Capital transfers are unrequited transfers, ~~either in cash or in-kind, in which the ownership where either the party making the transfer realizes the funds involved by disposing of an asset (other than cash or inventories) changes from one party to another; or that oblige one or both parties to acquire or dispose of an asset (other than cash or inventories); or where a liability is forgiven by the creditor, by relinquishing a financial claim (other than accounts receivable) or the party receiving the transfer is obliged to acquire an asset (other than cash or inventories) or both conditions are met.~~ Capital transfers are often large and irregular but neither of these are necessary conditions for a transfer to be considered a capital rather than a current transfer.

Table 110.5: The capital account - capital transfers - changes in liabilities and net worth

~~11.202~~11.236 A current transfer reduces the income and consumption possibilities of the first party and increases the income and consumption possibilities of the second party. Current transfers are therefore not linked to, or conditional on, the acquisition or disposal of assets by one or both parties to the transaction.

~~11.203~~11.237 Some cash transfers may be regarded as capital by one party to the transfer but as current by the other. For example, the payment of an inheritance tax may be regarded as the transfer of capital by the taxpayer but be regarded as a current receipt by government because it receives many such transfers. Similarly, a large country that makes investment grants to a number of smaller countries may regard the grants as current transfers even though they are specifically intended to finance the acquisition of capital assets. In an integrated system of accounts, such as the SNA, it is not feasible, however, to classify the same transaction differently in different places. Accordingly, a transfer should be classified as capital for both parties even if it involves the acquisition or disposal of an asset, or assets, by only one of the parties. By convention, social transfers are always treated as current transfers.

~~11.204~~11.238 There may be cases in which it is difficult to decide on the evidence available whether to classify a cash transfer as current or capital. When there is serious doubt, the transfer should be classified as current rather than capital. It should be noted, however, that the decision as to which way to classify a transfer has important consequences for the allocation of saving between sectors and subsectors, and possibly between the economy as a whole and the rest of the world. Other things being equal, a current transfer increases the saving of the recipient and reduces that of the donor, whereas a capital transfer does not affect the saving of either party. If, therefore, cash transfers are incorrectly classified between current and capital, the saving behaviour recorded for the units or subsectors involved may be misleading for purposes of economic analysis and policymaking.

2. Transfers in cash and in kind

~~11.205~~11.239 As explained in chapter 9, transfers may take place in cash or in kind. A capital transfer in kind necessarily concerns the change of ownership of a product previously recorded as a non-financial asset in the accounts of the donor. In this case, the four entries relating to the transaction are all recorded in the capital account. Two relate to the transfer of wealth implied by a capital transfer; the other two are shown as disposal of the asset being transferred by the donor and its acquisition by the recipient. The treatment of fixed assets produced by communal construction and then transferred to government to maintain is discussed in [paragraph 11.66.40.58](#).

~~11.206~~11.240 All other capital transfers have two entries in the capital account and two in the financial account. In the case of debt forgiveness, the two entries in the financial account show the reduction in the debt liability of the recipient towards the donor and the claim of the donor on the recipient. [In the case of debt assumption \(without an effective claim\) the two entries in the financial account are a reduction in the debt liability of the original debtor and a parallel increase in the debt liability of the party assuming the debt.](#) Other capital transfers are recorded as a transfer in cash and show a decrease in cash or deposits of the donor and an increase by the recipient.

Valuation

~~11.207~~11.241 The value of a non-financial asset being transferred is the estimated price at which the asset, whether new or used, could be sold on the market plus any transport, installation or other costs of ownership transfer incurred by the donor but excluding any such charges incurred by the recipient. Transfers of financial assets, including the cancellation of debts, are valued in the same way as other acquisitions or disposals of financial assets or liabilities.

3. Capital taxes

~~11.208~~11.242 Capital taxes consist of taxes levied at irregular and infrequent intervals on the values of the assets or net worth owned by institutional units or on the values of assets transferred between institutional units as a result of legacies, gifts inter vivos or other transfers. They include capital levies and taxes on capital transfers:

- a. Capital levies consist of taxes on the values of the assets or net worth owned by institutional units levied at irregular, and very infrequent, intervals of time. Capital levies are treated as exceptional

both by units concerned and by the government. They may be payable by households or enterprises. They include betterment levies: that is, taxes on the increase in the value of agricultural land due to planning permission being given by government units to develop the land for commercial or residential purposes (*GFSM20012014* tax code 1133; OECD 4500));

- b. Taxes on capital transfers consist of taxes on the values of assets transferred between institutional units. They consist mainly of inheritance taxes, or death duties, and gift taxes, including gifts inter vivos made between members of the same family to avoid, or minimize, the payment of inheritance taxes. They do not include taxes on sales of assets as these are not transfers (*GFSM20012014* tax code 1134; OECD 4300).

4. Investment grants

~~11.209~~11.243 Investment grants consist of capital transfers made by governments to other resident or non-resident institutional units to finance all or part of the costs of their acquiring fixed assets. The recipients are obliged to use investment grants for purposes of gross fixed capital formation, and the grants are often tied to specific investment projects, such as large construction projects. If the investment project continues over a long period of time, an investment grant in cash may be paid in instalments. Payments of instalments continue to be classified as capital transfers even though they may be recorded in a succession of different accounting periods.

~~11.210~~11.244 Investment grants in kind consist of transfers of transport equipment, machinery and other equipment by governments to other resident or non-resident units and also the direct provision of buildings or other structures for resident or non-resident units. These may be constructed by enterprises owned by the donor government or by other enterprises that are paid directly by the donor government. In such cases, a capital transfer in cash is usually recorded followed by purchase of the items actually transferred in kind. Exceptionally, if the transfer is of an existing asset, and the recipient is resident, the transfer of ownership of the asset may be recorded as negative capital formation by government and positive capital formation by the recipient, but a capital transfer is still also recorded so that the balance sheet of both parties correctly reflects the change in net worth that has taken place.

5. Other capital transfers

~~11.211~~11.245 *Other capital transfers consist of all capital transfers except capital taxes and investment grants.* One notable category included here is the cancellation of debt by mutual agreement between the creditor and the debtor. Such a cancellation is treated as a capital transfer from the creditor to the debtor equal to the value of the outstanding debt at the time of cancellation. It includes, but is not confined to, the cancellation of debt owed by non-residents to residents, and vice versa. Another example is the assumption of debt where a unit taking over the debt of another unit does not have an effective claim on the original debtor.

~~11.212~~11.246 However, the unilateral writing off of debt is not a transaction between institutional units and therefore does not appear either in the capital account or the financial account of the SNA. If the creditor accepts such a write off or default, it should be recorded in the other changes in the volume of assets account of the creditor and the debtor. Provisions, among which those for bad debt, are treated as bookkeeping entries that are internal to the enterprise and do not appear in the integrated framework of national accounts SNA except in the cases described in chapter 14, where they of expected losses on non-performing loans, which appear as memorandum supplementary items in the balance sheets. The unilateral repudiation of debt by a debtor is also not a transaction and is not recognized in the SNA.

~~11.213~~11.247 Capital transfers may take various other forms, of which some examples are given below:

- a.—
- a. Major payments in compensation for extensive damages or serious injuries not covered by insurance policies. They are typically intended to recover losses over a multi-year period or to replace an asset (financial or non-financial). The payments may be awarded by courts of law or settled out of court. They may be made to resident or non-resident units. They include payments of compensation for

damages caused by major explosions, oil spillages, the side effects of drugs, etc.;

- b. Economic contributions by individuals to another country to obtain an additional citizenship, passport, or long-term visa, if these contributions are specifically earmarked for capital investment projects.
- c. Exceptionally large insurance settlements in the wake of a disaster. For more details on when this is the appropriate form of recording see chapter 4724;
- d. Transfers from government units to publicly or privately owned enterprises to cover large operating deficits accumulated over two or more years;
- e. Transfers from central government to units at lower levels of government to cover some, or all, of the costs of gross fixed capital formation or large expenditure deficits accumulated over two or more years;
- f. Legacies or large gifts inter vivos, including legacies to NPIs;
- g. Exceptionally large donations by households or enterprises to NPIs to finance gross fixed capital formation: for example, gifts to universities to cover the costs of building new residential colleges, libraries, laboratories, etc.;
- h. Unrequited or partially requited transfers of responsibility for pension entitlements, for example when general government assumes responsibility for pensions provision from an employer;
- ~~h.i.~~ Negotiated changes in the terms and conditions of defined benefit pension entitlements;
- ~~i.j.~~ Community built assets where responsibility for maintenance is then assumed by government or by an NPISH.