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## Statistical Classifications in Agricultural Sector: Methodology for Applications

Analysis of international and national standards and classifications for agricultural sector, amendments and new items introduced in the classifications in order to have comparable data is made in the Ukrainian context. Methodological principles used to ensure comparability of data in transition from previous to next versions of classifications is shown are highlighted. The structure of the Ukrainian Classification of Economic Activities (CEA) is analyzed by classification level from the perspective of agricultural sector. It is emphasized that essential distinction between the previous and the new version of CEA is more detailed positions for recording of data on products by economic activity, especially at the lowest levels, which causes incomparability of data series computed by these versions. The algorithm for harmonization of CEA is illustrated by agricultural sector. Structural change in Section A "Agriculture, Hunting and Forestry" is demonstrated. Within Section A, structures of Division 01 "Plant-growing and stock-raising, hunting and related services", Division 02 "Forestry and timber cutting", Division 03 "Fishery and breeding of aquacultures" are shown. It is concluded that the approach to harmonization of national classifications, used in Ukraine now, i. e. taking European classifications as analogues and their decomposition at national level, can be regarded as appropriate as it can ensure harmonization of national classifications with international ones, along with standardization of terminology, definitions and explanatory notes.

**Key words:** *statistics of agriculture, statistical classifications, Nomenclature of Agricultural Products, Classification of Economic Activities, structure of classifications.*

Agriculture has a critical socio-economic importance. It is a diversified object consisting of many linked industries. Its main objective as a productive sector is to meet public needs in foods and industrial needs in agricultural resources on the sustained basis.

Agriculture is a leading industry within the agro-industrial complex of Ukraine, a mix of industries engaged in production, storage, processing and distribution of agricultural products for final consumption [1, p. 9]. Construction and implementation of the statistical classifications system harmonized with international standards for statistical classifications and enabling for in-depth statistical analysis of the agriculture performance and structure, forecasting of tendencies in the agricultural sector of Ukraine is, therefore, central to development of the national statistics and its adaptation to globalization of agricultural sector. Agricultural statistics is demanded by exporters as the reference in making up business contracts and subsequent monitoring of business transactions. Statistical data reflecting development of market-based relations in agricultural sector cannot be considered as a finished statistical product unless they are systematized by use of statistical classifications.

The objective of the study is to analyze international and national standards and classifications for agricultural sector, amendments and new items in-

troduced in the classifications in order to have comparable data required for setting up priorities and strategies. Statistical classification systems cannot be developed or improved unless comparability of statistical indicators is ensured when classifications or classification methodologies are changed. An example is transition from current versions of central national classifications to their new versions, which is the case of the Nomenclature of Agricultural Products.

Issues of construction, implementation and revision of international statistical classifications are emphasized mostly in methodological and instructive literature devoted to international, European and national classifications [2–5]. Methodological principles for constructing statistical classifications are discussed in works of M. Burgin, Yu. Zhukovska, V. Karpov, L. Momotyuk, O. Osaulenko, N. Parfentseva, M. Sydorenko, N. Tovmachenko, A. Varnidis and other domestic researchers and statisticians. It should be noted, however, that the problem related with implementation of new national statistical classifications and harmonization of statistical data has not been dealt with. Search for its solutions is of significant importance for the current official statistics in Ukraine, development of statistical science and practice, because they determine the quality of information at all administrative levels. The existence of a generally excepted procedure allowing for processing large flows of statistical information, their regular

analyses and dissemination is a required condition for operation of the official statistical service. Analytical works at micro- or macro-level cannot be effective without a single system of classifications applicable for international and national level.

Current systems of international statistical classifications are built as frameworks providing for comparability of key statistical indicators (economic or social ones) at multinational and national level. International and European statistical classifications are subject to continual revisions, corrections, additions, and new classifications are created in case of need, which is caused by the development of global economy. Any change in the system of international classifications entails change in analogous classifications at country level.

As statistical classifications are up-dated on regular basis, the problem of indicators' comparability needs to be dealt with once previous versions of classifications are replaced by new ones. The principle of harmonization is a main principle behind building up classification systems, their parallel existence and effective interactions. It sets up links between previous and newly adopted versions of classifications.

The principle of harmonization is implemented by use of transition keys, through constructing comparative tables. Yet, the method of transition keys cannot be adequately used when new versions of non-harmonized classifications are introduced, especially in transition from current to new versions of the Classification of Economic Activities and the Central Statistical Classification, because of essential change in the classification structure. National statistical classifications in Ukraine were built by taking analogous international classifications, which were all the central classifications of EU. There are 19 national classifications in Ukraine now, of which 16 are based on

methodological principles of international statistical classifications and standards. Of these, the main ones are Classification of Economic activities (CEA), Central Statistical Classification of Products by Economic Activity (Central Statistical Classification), Ukrainian Classification of Commodities of Foreign Economic Activities (UCCFEA).

CEA is the main national statistical classification. Its implementation in the Ukrainian official statistics began in 2001. The issue of new versions of CEA and Central Statistical Classification came to the agenda due to the need of their harmonization with new version of main European statistical classifications (with NACE Rev. 2 and CPA 2008) [6; 7].

Essential distinction between the previous and the new version of CEA is more detailed positions for recording of data on products by economic activity, especially at the lowest levels, which causes incomparability of data series computed by these versions.

Standard groupings are used for economic analysis, international comparisons of national accounts and dissemination of statistical data from official statistical observations. CEA is built by hierarchical system of coding by use of alphanumeric code. Literal symbols of sections are used as headings and are not used in coding. For further decomposition of CEA sections (division, group, and class) numeric codes are used:

**Y XX. XX,**

where Y – section, letters of Latin alphabet, A to U;  
XX – division, marked with double-digit code;  
XX.X – group, marked with three-digit code;  
XX.XX – class, marked with four-digit code.

CEA is harmonized with International Standard Industrial Classification (ISIC, Rev. 4 – 2008) at the level Y XX (division), and with Classification of Economic Activities of EU (NACE, Rev. 2 – 2006) at the level Y XX.XX (class), Table 1.

Table 1

**CEA structure (for agriculture) by classification level**

| Section (Y) | Divisions (XX) | Groups (XX.X) | Classes (XX.XX) |
|-------------|----------------|---------------|-----------------|
| A           | 3              | 13            | 39              |

Statistical data obtained from the official statistical observation of operation of agricultural enterprises is summed up by territory of the observation unit activities, i. g. by location of land plots, and grouped by current national statistical classifications: Classifier of Administrative and Territorial Units of Ukraine (CATUU), Statistical Classifier of Organizational Forms of Economic Entities (SCOF), Nomenclature of Agricultural Products (NACP) approved by Resolution of the State Statistics Service of Ukraine from October 15, 2014, No 300, which contains the nomenclature of agricultural plants, fruits, berries and

grapes [8; 9; 10]. SCOF is used to group agricultural enterprises by organization form of economic entities (public enterprises, non-public enterprises, including farms). CATUU is used to group observation data by district, city and region.

Structural change in Section A “Agriculture, Hunting and Forestry” is shown in Table 2.

Sections A ‘Agriculture, Hunting and Forestry’ and B “Fishery, Pisciculture” in the new classification are combined in one section A “Agriculture, Forestry, and Pisciculture”, consisting of 3 divisions (Table 3).

Table 2

Structural change in Section A “Agriculture, Hunting and Forestry”

| Classification levels | NACE (Rev. 1.1) | NACE (Rev. 2) |
|-----------------------|-----------------|---------------|
| Sections              | 2               | 1             |
| Divisions             | 3               | 3             |
| Groups                | 7               | 13            |
| Class                 | 16              | 39            |

Table 3

Structure of Division 01 “Plant-growing and stock-raising, hunting and related services”, Section A

|      |  |
|------|--|
| 01.1 | Cultivation of seasonal plants                                   |
| 01.2 | Cultivation of perennial plants                                  |
| 01.3 | Reproduction of plants   |
| 01.4 | Stock-raising  |
| 01.5 | Mixed agriculture  |
| 01.6 | Ancillary activities in agriculture and after-harvest activities |
| 01.7 | Hunting, catching of animals and related services                |

Decomposition level in groups of agricultural activities is deepened and consists of 18 classes. Classification groups are built by breakdown into cultivation of one-year and perennial plants in plant-growing, not including the activities related with decorative horticulture and landscape design; activities related with breeding of cattle for meat and milk purposes, aquatic animals is broken down; activities related with breeding of pets are not included. Classification of stock-

raising is based on breakdown of animals by breeding conditions – stall or pasture; animal species are specified. The structure of activities in agriculture is given in Table 3.

Division 02 “Forestry and timber cutting” has more detailed decomposition at group level compared to the previous version, with the number of groups increased to 4 (Table 4). Also, natural and cultivated forests are combined.

Table 4

Structure of Division 02 “Forestry and lumber-camp”, Section A

|      |   |
|------|---|
| 02.1 | Forestry and other activities in forestry |
| 02.2 | Timber cutting                            |
| 02.3 | Gathering of wild non-woody timber        |
| 02.4 | Ancillary services in forestry            |

Division 3 “Fishery and breeding of aquacultures” in Section A consists of 2 groups, each decomposed by

type of aquaculture (marine and freshwater), without a separate group for ancillary services (Table 5).

Table 5

Structure of Division 03 “Fishery and breeding of aquacultures”, Section A

|      |                          |
|------|--------------------------|
| 03.1 | Fishery                  |
| 03.2 | Breeding of aquacultures |

To sum up, there has been progress in creating national classifications harmonized with international classifications and standards. In keeping with Eurostat recommendations, Ukrainian national classifications of economic activities, products and commodities are created by use of European classifications

with their further decomposition at national level. This approach can be regarded as appropriate as it can ensure harmonization of national classifications with international ones, along with standardization of terminology, definitions and explanatory notes.

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### Статистичні класифікації у сільському господарстві: методологія застосування

У соціально-економічному розвитку країни сільське господарство посідає особливе місце. Автором наголошено, що головною передумовою розвитку національної статистики сільського господарства, адаптованої до умов глобалізації аграрного виробництва, є створення та впровадження гармонізованої з міжнародними стандартами системи статистичних класифікацій. Ці класифікації уможливають змістовний статистичний аналіз стану сільськогосподарського виробництва в Україні, прогнозування його розвитку, дослідження структури. Статистична інформація щодо сільського господарства необхідна учасникам експортних переговорів, оскільки є орієнтиром при розробленні конкретних зобов'язань в аграрній галузі та для подальшого моніторингу їх виконання. Вказано, що статистичний продукт в частині розвитку конкурентних відносин в аграрній галузі не може розглядатися без його систематизації та логічного упорядкування, які забезпечують статистичні класифікації.

Розвиток та вдосконалення систем статистичних класифікацій вимагають вирішення питань щодо забезпечення порівнянності статистичних показників при переході від однієї класифікації до іншої, а також у разі змін методологічних принципів побудови класифікацій. Зазначено, що проблема впровадження нових національних статистичних класифікацій та забезпечення порівнянності й узгодженості статистичних даних залишається невирішеною, тому її розв'язання набуває вагомого значення для сучасної державної статистики України, розвитку статистичної науки і практики, оскільки цим значною мірою визначається якість інформаційного забезпечення управління на всіх рівнях. Розглянуто статистичні класифікації у сільському господарстві, вирішено проблеми забезпечення порівнянності показників при переході від попередніх до наступних версій класифікацій, проаналізована кількісна структура класифікації видів економічної діяльності (розділ “Сільське господарство”) за класифікаційними рівнями. Викладено зміни у структурі секції А “Сільське господарство, лісове господарство та риболовство”.

**Ключові слова:** статистика сільського господарства, статистичні класифікації, номенклатура продукції сільського господарства, класифікація видів економічної діяльності, структура класифікацій.

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### **Статистические классификации в сельском хозяйстве: методология применения**

Рассмотрено применение статистических классификаций в сельском хозяйстве. Изложены подходы к решению проблем обеспечения сопоставимости показателей при переходе от предшествующих к следующим версиям статистических классификаций. Проанализирована количественная структура КВЭД (раздел “Сельское хозяйство”) по классификационным уровням.

**Ключевые слова:** *статистика сельского хозяйства, статистические классификации, номенклатура продукции сельского хозяйства, классификация видов экономической деятельности, структура классификаций.*

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Реєстрація пройшла в Паризькому міжнародному центрі, який діє за підтримки ЮНЕСКО та уряду Франції. У ISSN-реєстрі були зареєстровані на постійній основі друкована та онлайн версії журналу.

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