AGROVOC 4

AGROVOC editorial guidelines

AGROVOC editorial guidelines

AGROVOC

Contents

Abbreviations and acronyms

BARTOC	Basic Register of Thesauri, Ontologies & Classifications
BT	broader term
CAT	Chinese Agricultural Thesaurus
FAO	Food and Agriculture Organization of the United Nations
FAOTERM	FAO Terminology
GEMET	General Multilingual Environmental Thesaurus
ICTV	International Committee on Taxonomy of Viruses
IFLA	International Federation of Library Associations and Institutions
ISO	International Organization for Standardization
KOS	knowledge organization system
M49	Standard Country or Area Codes for Statistical Use
NALT	National Agricultural Library Thesaurus
NISO	National Information Standards Organization
NOCS	FAO Names of Countries database
NT	narrower term
OWL	Web Ontology Language
RDF	Resource Description Framework
SKOS	Simple Knowledge Organization System
SPARQL	SPARQL Protocol and RDF Query Language
UNBIS	United Nations Bibliographic and Information System
UNESCO	United Nations Educational, Scientific and Cultural Organization
URI	Uniform Resource Identifier
URL	Uniform Resource Locator

Summary

This unit highlighted why the AGROVOC editorial guidelines are important to ensure coherence in content, and key areas to consider when suggesting new content. Important criteria for definitions were outlined, and subvocabularies within AGROVOC were introduced.

Learning objectives

At the end of this unit, learners will be able to:

- ✅ understand why the AGROVOC editorial guidelines are important to ensure coherence in content

- ✅ be familiar with key areas to consider when suggesting new content

- ✅ understand criteria for definitions

- ✅ be aware of subvocabularies within AGROVOC

The AGROVOC editorial guidelines

1.
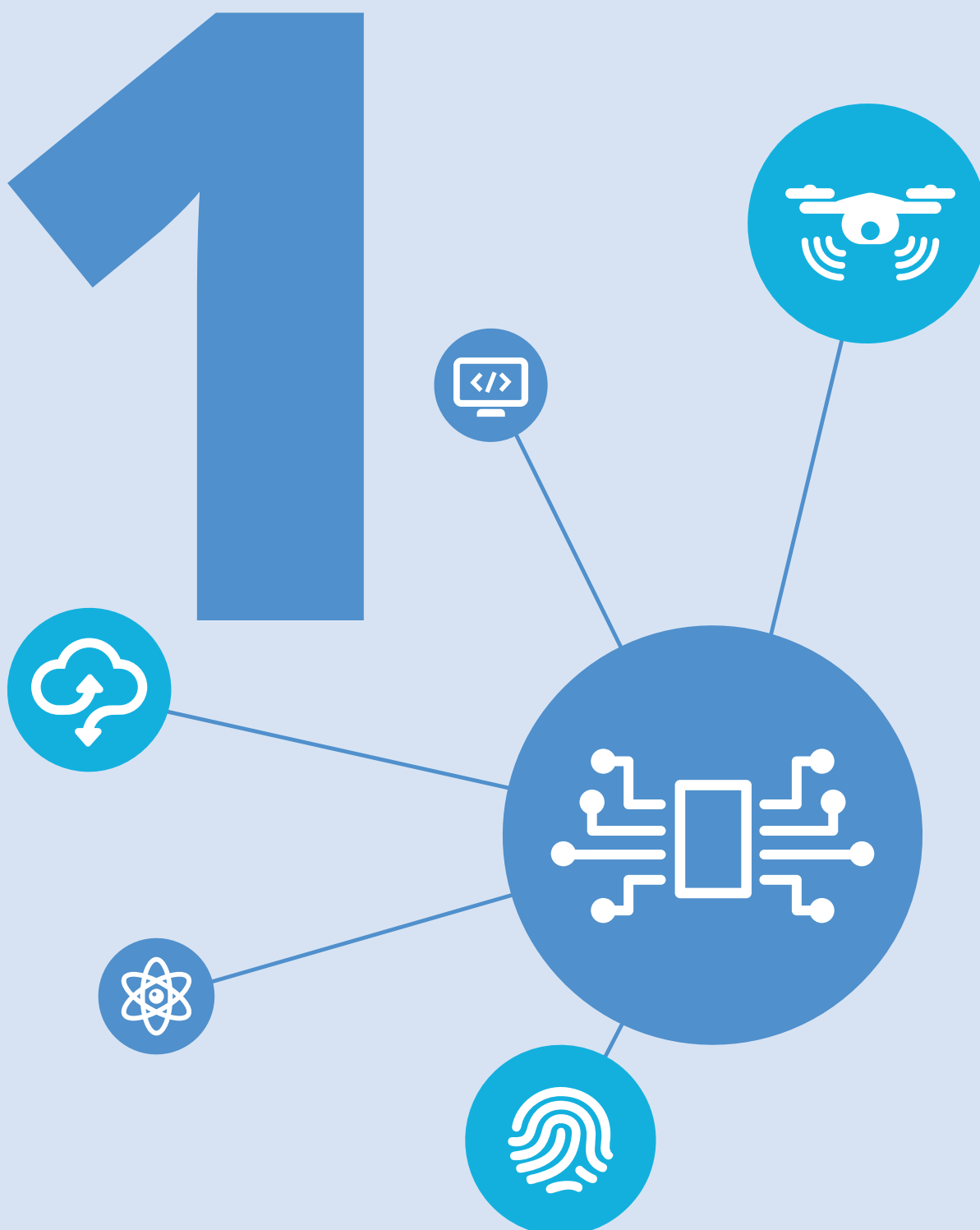
The AGROVOC editorial guidelines
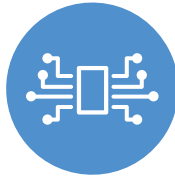
AGROVOC is coordinated by the Food and Agriculture Organization of the United Nations (FAO). With a shift to distributed management of AGROVOC by working with editors worldwide, clear, concise and agreed guidelines are needed to coordinate all the efforts to guarantee consistency and coherence on the selection of concepts and terms (FAO, 2021). The guidelines also apply to AGROVOC subvocabularies. The most recent AGROVOC editorial guidelines were published in 2022, see Figure 1. Clear, concise and agreed guidelines are needed to guarantee consistency and coherence on selection of concepts and terms.

The editorial guidelines provide instructions on how to choose the preferred and non-preferred terms, and which form and capitalization should be used. The guidelines provide detailed instructions for different cases, especially regarding term form, style and language. The guidelines are broadly in line with the International Organization for Standardization (ISO, 2011 and ISO, 2013) and National Information Standards Organization standards for thesauri (NISO, 2005) and the International Federation of Library Associations and Institutions (IFLA) Guidelines for Multilingual Thesauri (IFLA, 2009).

Figure 1. The AGROVOC Editorial Guidelines, Second edition
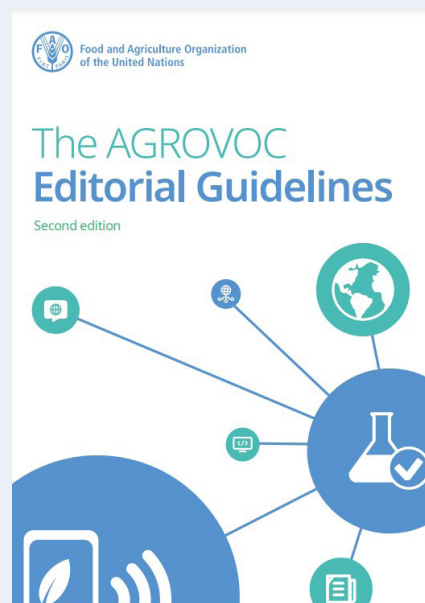
Source: FAO. 2022a. The AGROVOC Editorial Guidelines – Second edition. Rome. Cited 20 April 2022. https://doi.org/10.4060/cb8640en

In the second edition of the AGROVOC Editorial Guidelines, additional guidance has been added on scientific names, spelling, definitions and more (FAO, 2022). This guide is a set of editorial recommendations for adding content to AGROVOC, with a strong focus on multilingual aspects. See Figure 2 for content overview. It is strongly recommended that editors read the guidelines carefully. Most of the effort for new concepts and terms is required before entering suggestions in VocBench, see Figure 3.

Figure 2. Content of the AGROVOC Editorial Guidelines, Second edition

Contents

Source: FAO. 2022a. The AGROVOC Editorial Guidelines – Second edition. Rome. Cited 20 April 2022. https://doi.org/10.4060/cb8640en

Figure 3. Adding new terms and concepts to AGROVOC

Source: FAO. 2022a. The AGROVOC Editorial Guidelines – Second edition.
Rome. Cited 20 April 2022. https://doi.org/10.4060/cb8640en

AGROVOC scope and consulting authorities

AGROVOC scope and consulting authorities

As a preliminary step, it is recommended that the editor checks whether the concept or term already exists in AGROVOC, using Skosmos or VocBench, and that it is relevant to the scope of AGROVOC: agriculture, fisheries, forestry, natural environment, food security, economics. New terms or concepts can be suggested through VocBench or by email to AGROVOC@fao.org.

When making a suggestion, the following elements should be avoided:

- duplicates of existing concepts;
- trademarked names (e.g. brand names and commercial names);
- names of plant varieties, names of individuals;
- adjectives;
- names of specific software, models, policies, programmes or initiatives;
- individual publication titles (e.g. "The State of Food and Agriculture 2021"); and
- concepts not within the scope of AGROVOC (e.g. "intensive care" and "mortgage holiday").

Neologisms, slang and jargon are generally not included as concepts. Concepts should have international relevance. A concept describing a practice only used in one country is thus discouraged, unless it is of global relevance, such as a practice with the United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage relevance. In general, names of cities should not be included in AGROVOC.

If in doubt about adding a new concept, it is better to leave it out or consult a colleague. Duplicates of existing concepts must be avoided. If an existing concept is similar to another existing concept, the definition should clarify the difference. The slash or solidus (/) should be avoided, for example "afforestation/reforestation". Use two separate concepts if these differ in meaning, or set one as an alternative label if meaning is the same.

To avoid adding a duplicate of an existing concept, look for synonyms and consider spelling variants ("behaviour", not "behavior"), singular vs plural, ("communities", not "community") and hyphenation ("agrifood systems", not "agri-food systems"). This will differ by language, so please check the AGROVOC editorial guidelines.

Terms are seen in both two-word and one-word forms. The preferred term is the one most commonly used by experts and in expert literature of the specific field, such as "temperature regulation" or "thermoregulation". Which of these is the preferred term will depend on the subject and the language. Terms may comprise more than one word, but multiple word compound terms should express a single concept or unit of thought.

Complex compound concepts are discouraged. For example, "unpaid care work" and "food chain approach to food safety" are complex compound terms that express multiple concepts, while "controlled atmosphere storage" and "food safety" are multiple word compound terms that express a single concept. International standards generally recommend splitting compound words into simpler concepts. This may vary by language. Maintaining distinct semantic elements is useful to facilitate machine searches and to detect structural relationships between concepts (FAO, 2022).

2.1 Consulting authorities

Terms included in AGROVOC must be used in relevant literature (scientific papers, books, etc.) or by relevant institutions (public sector organizations, agricultural extension organizations, etc.). For names of animals and plants, it is necessary to search for both their scientific/ taxonomic names and common/local names.

It is important to check terms with other vocabularies, but avoid circular reasoning (if a term is wrong in vocabulary X that cites AGROVOC, future AGROVOC editors may think X must be correct). When possible, primary authorities should be used. Consider consulting agricultural thesauri such as the CAB Thesaurus, published by the Centre for Agriculture and Bioscience International, or the United States Department of Agriculture National Agricultural Library Thesaurus (NALT) to have a better idea of the names they use to represent concepts. Thesaurus logic may differ. Trusted sources are also recommended, such as the International Committee on Taxonomy of Viruses (ICTV) for viruses or FAO Terminology (FAOTERM) for general agricultural terms.

Some examples of primary authorities for editors to consult include:

- FAOTERM (www.fao.org/faoterm/en) (multilingual);

- FAO (www.fao.org/home/en);

- FAO Names of Countries (NOCS) database (www.fao.org/nocs) (multilingual);

- United Nations Educational, Scientific and Cultural Organization (UNESCO) Thesaurus (http://vocabularies.unesco.org/browser/thesaurus/en) (multilingual);

- United Nations Bibliographic and Information System (UNBIS) Thesaurus; (http://metadata.un.org/thesaurus) (multilingual);

- CAB Thesaurus (www.cabi.org/cabthesaurus) (multilingual);

- NALT (https://agclass.nal.usda.gov/thesaurus-search);

- Basic Register of Thesauri, Ontologies & Classifications (https://bartoc-skosmos.unibas.ch/en);

- Interactive Terminology for Europe (https://iate.europa.eu/home) (multilingual);

- European Union vocabularies (https://op.europa.eu/en/web/eu-vocabularies) (multilingual);

- General Multilingual Environmental Thesaurus (GEMET) (www.eionet.europa.eu/gemet) (multilingual);

- AgroPortal (http://agroportal.lirmm.fr);

- AlgaeBase (www.algaebase.org);

- CGIAR Crop Ontology (www.cropontology.org);

- European and Mediterranean Plant Protection Organization Global Database (https://gd.eppo.int); and

- Fungi Index Fungorum (www.indexfungorum.org/names/names.asp).

Considerations at term level

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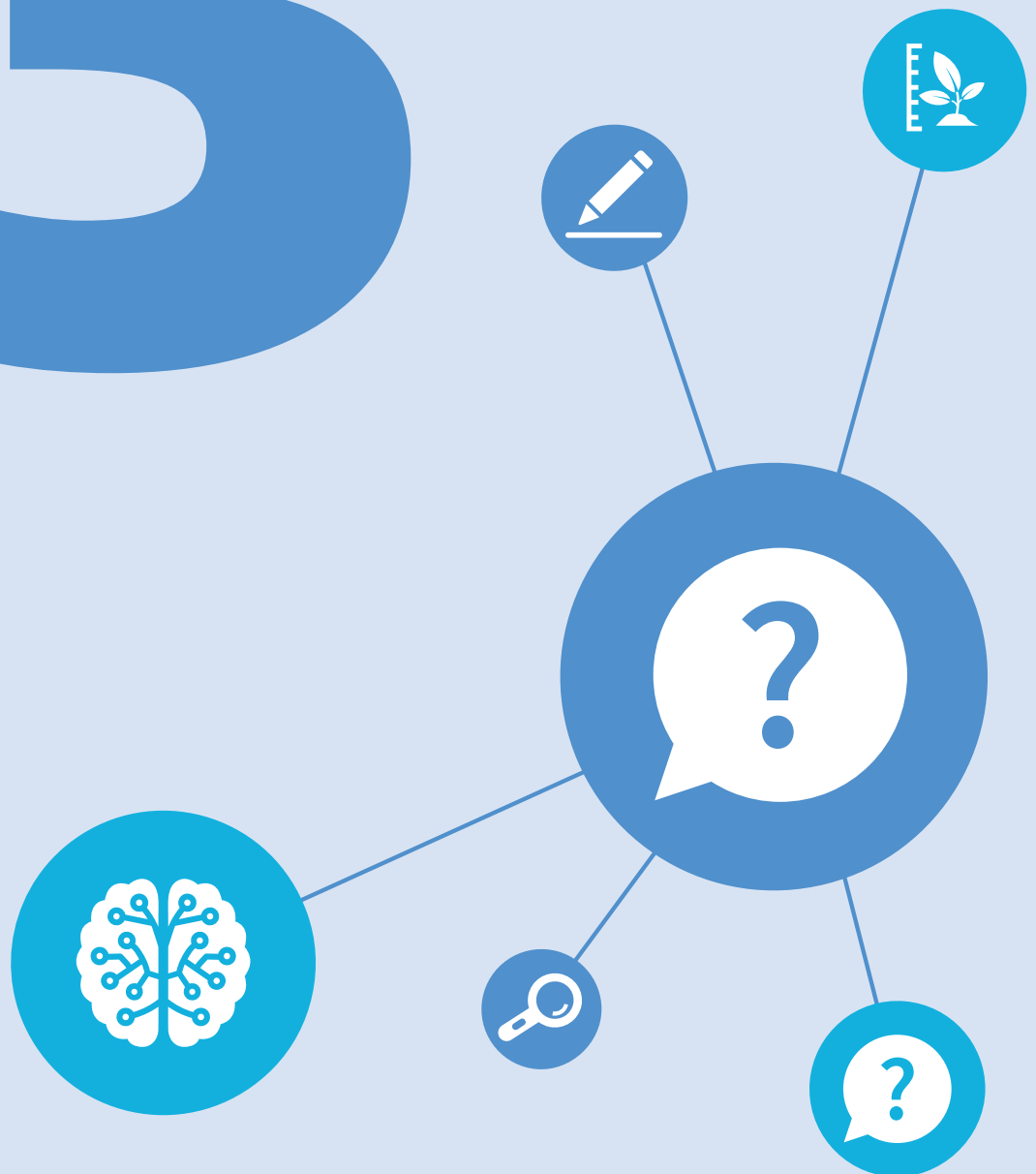
Considerations at term level

A concept has only one preferred term in any given language. All the alternative terms to name a concept in any given language are called non-preferred terms, see Figure 4. The more commonly used term is the preferred term, but the editor can check with other reputable authorities.

Figure 4. Preferred and non-preferred terms
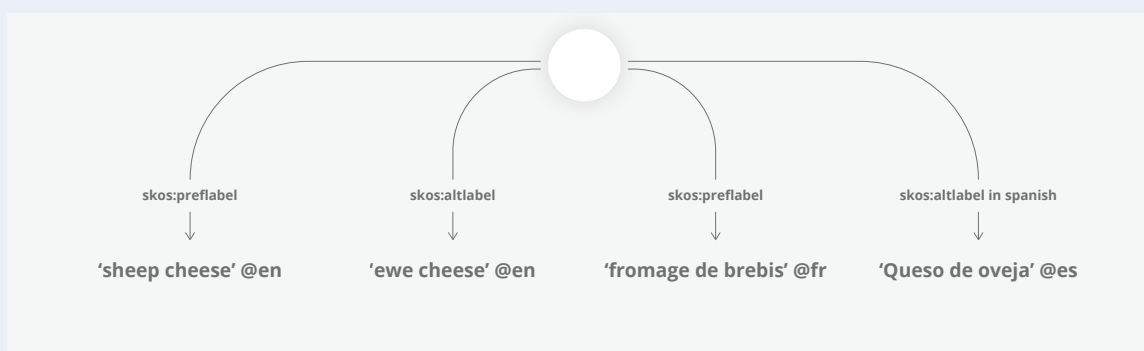
| skos:preflabel | skos:altlabel | skos:preflabel | skos:altlabel in spanish |

'sheep cheese' @en   'ewe cheese' @en   'fromage de brebis' @fr   'Queso de oveja' @es

Source: FAO. 2022a. The AGROVOC Editorial Guidelines – Second edition. Rome. Cited 20 April 2022. https://doi.org/10.4060/cb8640en

If a concept exists in AGROVOC but does not have a term in a specific language, it is possible to suggest a new preferred term (and nonpreferred terms, if needed). However, an exact term may not always exist in the target language. In this case, a term that is commonly used is recommended over an artificial or literal translation. In addition, it is also preferable to use a term from the source language, such as English, only if it is used in the target language (e.g. "Farmer Field School"@de). Another option is to use a similar term with the same meaning, such as `:c _ 2cfe62a` "from farm to fork", "de la ferme à la table"@fr and "fra jord til bord"@nb.

The AGROVOC Editorial Guidelines include specifications for particular languages: case, singular and plural, punctuation, diacritics and special characters, where applicable. Remember to consult what applies for the language in question. For spelling, the official rules of the languages should be followed. In addition, all terms should be given in the script of the individual languages, unless writing a scientific name in Latinate. The FAO style guide is recommended for AGROVOC content in English, French, Spanish, Arabic, Chinese and Russian languages.

Example on alphabet, diacritics and special characters:

- Belarusian (be). Cyrillic is used. The letters with diacritics (ё, й and ў) and apostrophe (') are used according to common orthographic rules, for example "самалёты"@be, "надой малака"@be and "надвор'е"@be.

- Chinese (zh). AGROVOC uses simplified Chinese, not traditional Chinese. Some scientific names may contain characters that are hard to distinguish, particularly fish species. Please use half-width parentheses without space before or after the term. For example, "亚马孙 (委内瑞 拉)"@zh should be "亚马孙(委内瑞拉)"@zh.

- German (de). The characters Ä, Ö, Ü, ä, ö, ü and ß are used according to the common spelling of the word. In early versions of AGROVOC, other rules applied, such as oe used for ö, but are no longer relevant. A hyphen (-) might be used to connect parts of compound terms according to the general spelling rules.

Each label must be unique in a specific language; identical labels for different concepts in one language are not allowed. It is possible to suggest a new preferred label for a concept, if needed, as terminology does evolve. For example, "fishers" has replaced "fishermen". However, labels should not be removed unless there was an actual mistake. In cases like this, it is better to add the new term "fishers" as a suggested new preferred label, which will make "fishermen" a new non-preferred term. Legacy labels are still relevant for indexing older resources (FAO, 2022).

3.1 Disambiguation

Disambiguation might be needed if one wants to suggest a term for a concept already available, but the term is already in use by another concept in this language. This is done by adding a qualifier. Examples `:c _ 15903` "poisson (aliment)"@fr and `:c _ 2943` "poisson (animal)"@fr, and `:c _ 6831` "boards (wooden)" and `:c _ 50163` "boards (organizations)". Homonyms also occur in taxonomy, such as `:c _ 25510` "Vanilla (genus)" and `:c _ 15126` "vanilla (spice)".

Disambiguation should be used only when necessary. Depending on the language, term qualifiers may not be needed in a lexicalisation, such as `:c _ 25510` "Vanilla"@fr and `:c _ 15126` "vanille"@fr. This requires an evaluation by each editor.

3.2 Geographical names

AGROVOC contains all names of countries recognized by the United Nations, as defined in FAOTERM and in the FAO NOCS database and/or the UNBIS Thesaurus. The three-digit ISO 3166 alpha code of a country or area represents its identity, whereas the M49 numerical code represents its statistical area.

> Short names are generally entered as preferred terms (`skos:prefLabel`), while long names and abbreviations/acronyms are entered as non-preferred or alternative terms (`skos:altLabel`), for example "Rwanda", "Republic of Rwanda"; "European Union", "EU"; and "Saint Lucia", "St Lucia". Types of countries, like "Small Island Developing States", are under subconcept "countries". For old names of countries, the label-to-label Agrontology property `HasOldName` is used (e.g. "Rwanda" `HasOldName` "Rwandese Republic", "European Union" `HasOldName` "European Common Market").

Authoritative resources should be consulted for the geographical entities, sub- and supranational organizations, and entities of physical geography (e.g. for the official form of names of mountains, rivers, lakes, valleys, etc.). The official form should be the preferred term, and all other variants are considered non-preferred terms. In the case of names of entities from physical geography, such as names of mountains, rivers and lakes, for English, for example, consider adding the word "mountain", "river", "lake", etc., directly to the term (without parentheses) to disambiguate it from regions, cities, etc., with the same name. AGROVOC is not a geographical thesaurus, so smaller geographical entities such as cities are discouraged.

Enriching a concept: definitions, notes, alignments, internal semantics

4

Enriching a concept: definitions, notes, alignments, internal semantics

Providing more information for a concept is helpful for enriching a concept: for example, a definition for context, machine-readable alignments to the same concept in other thesauri, and notes for additional clarification if needed.

4.1 Definitions

Definitions help AGROVOC users to understand concepts and decide how to use them. The definition is a statement or formal explanation of the meaning of a concept. In Simple Knowledge Organization Systems (SKOS), definitions are expressed by the predicate skos:definition. The following considerations should be followed when adding definitions (FAO, 2022).

- Definitions consist of a narrative and its source, which are both mandatory.
- A good definition explains what a concept is, not what it does.
- Only one definition per language is recommended.
- A definition is a sentence that requires orthographical rules, such as starting a sentence with a capital letter and ending a sentence with a full stop (period).
- The AGROVOC definitions need to be concise (ideally one sentence) and clear.
- A definition may be expressed in one or more AGROVOC languages.
- A definition does not have to be a translation of an existing definition, but all definitions for a concept should have the same conceptual meaning.
- A definition should implicitly explain the difference from closely related concepts.
- Circular, imprecise or negative definitions should be avoided.
- A trusted and stable source for the definition, such as an external glossary or thesaurus of a well-known institution, is required.

> The source should be:
>
> - a Uniform Resource Locator (URL) (e.g. www.fao.org/3/ca9182en/CA9182EN.pdf); or
>
> - a descriptive text, such as the name of the publication (e.g. "The pollination of cultivated plants: a compendium for practitioners-Vol. 2, FAO, 2018"). If descriptive text is selected, the citation of the source (including the title, author and year) should be added; or
>
> - an authority (e.g. "Land Administration Domain Model ISO 19152:2012").

To combine free text and URL, which is encouraged, the descriptive text should be used, for example: "FAO. 2022. The State of World Fisheries and Aquaculture 2022. Towards Blue Transformation. Rome, FAO. https://doi.org/10.4060/cc0461en"

As an example, the concept "healthy diets" (see Figure 5) has a definition from an authority combining text and URL: "FAO, IFAD, UNICEF, WFP and WHO. 2020. The State of Food Security and Nutrition in the World 2020. Transforming food systems for affordable healthy diets. Rome, FAO. https://doi.org/10.4060/ca9692en"

Figure 5. Example of a definition shown in Skosmos

entities > meal patterns > diet > healthy diets

PREFERRED TERM	ⓘ **healthy diets**
DEFINITION	ⓘ A balanced, diverse and appropriate selection of foods eaten over a period of time. A healthy diet ensures that the needs for macronutrients (proteins, fats and carbohydrates including dietary fibres) and essential micronutrients (vitamins, minerals and trace elements) are met specific to the person's gender, age, physical activity level and physiological state. (en)
BROADER CONCEPT	diet (en)
IN OTHER LANGUAGES	نظام غذائي صحي ⓘ Arabic
	ⓘ 健康膳食 Chinese
	ⓘ **alimentation saine** French
	ⓘ *alimentation salubre*
	ⓘ **gesunde Ernährung** German

Source: FAO. 2020. AGROVOC Skosmos browser. Cited 15 November 2020. https://agrovoc.fao.org/browse/agrovoc/en/

4.2 Alignments

AGROVOC is aligned to more than 20 other datasets, which allows for crosswalks between data that use AGROVOC and data that use other knowledge organization systems (KOS) linked to it (FAO, 2021), see Figure 6. SKOS has a few properties that allow linking of concepts to external Uniform Resource Identifiers (URIs): exactMatch, closeMatch, narrowMatch, broadMatch, relatedMatch. It is critical to identify concepts in other vocabularies that can be matched with AGROVOC and to use their URIs as values of these properties, as appropriate. See Figure 7 for an example of alignments for a concept, as shown in Skosmos. Unit 5 provides more detail on how to do this in VocBench. Alignments need to be maintained and updated as the target vocabularies evolve.

Examples of trusted alignment targets include the:
- National Agricultural Library Thesaurus and Glossary (NALT) (http://agclass.nal.usda.gov);
- Chinese Agricultural Thesaurus (CAT) (http://cat.aii.caas.cn);
- EuroVoc and other European Union vocabularies (https://op.europa.eu/en/web/eu-vocabularies);
- GEMET (www.eionet.europa.eu/gemet);
- United Nations Bibliographic and Information System (UNBIS) (http://metadata.un.org/thesaurus);
- DBPEDIA (http://dbpedia.org/void/Dataset); and
- Wikidata (www.wikidata.org).

Figure 6. Some of the datasets to which AGROVOC is linked
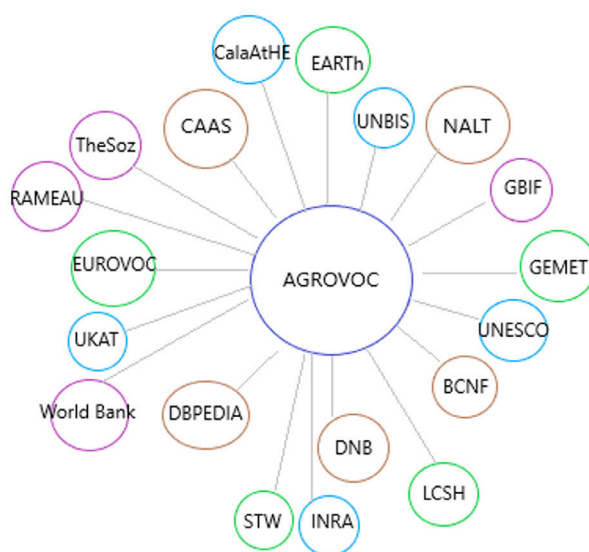
Source: Author's own elaboration

AGROVOC uses `skos:mappingRelation` subproperties for aligning to concepts in other vocabularies. In particular, these are `skos:closeMatch`, `skos:exactMatch`, `skos:broadMatch`, `skos:narrowMatch` and `skos:relatedMatch`. These are defined according to SKOS (W3C, 2009) as:

> "The properties `skos:broadMatch` and `skos:narrowMatch` are used to state a hierarchical mapping link between two concepts.
>
> The property `skos:relatedMatch` is used to state an associative mapping link between two concepts.
>
> The property `skos:closeMatch` is used to link two concepts that are sufficiently similar that they can be used interchangeably in some information retrieval applications. In order to avoid the possibility of "compound errors" when combining mappings across more than two concept schemes, `skos:closeMatch` is not declared to be a transitive property.
>
> The property `skos:exactMatch` is used to link two concepts, indicating a high degree of confidence that the concepts can be used interchangeably across a wide range of information retrieval applications. `skos:exactMatch` is a transitive property, and is a sub-property of `skos:closeMatch`."

In AGROVOC, the main mapping relations used to other vocabularies are `skos:closeMatch` and `skos:exactMatch`.

Figure 7. Example of alignments for the concept "food safety" shown in Skosmos

URI	http://aims.fao.org/aos/agrovoc/c_33995	
Download this concept:	RDF/XML TURTLE JSON-LD	Created 2/3/12, last modified 3/28/22
CLOSELY MATCHING CONCEPTS	http://dbpedia.org/resource/Food_safety	dbpedia.org
EXACTLY MATCHING CONCEPTS	http://eurovoc.europa.eu/6569	eurovoc.europa.eu
	http://lod.nal.usda.gov/nalt/10482	lod.nal.usda.gov

Source: FAO. 2022b. AGROVOC Skosmos browser. Cited 3 November 2022.
https://agrovoc.fao.org/browse/agrovoc/en/

AGROVOC

4.3 Notes

AGROVOC currently uses three types of notes: 1) editorial notes, 2) scope notes, and 3) history notes. It is optional to translate notes.

> **Editorial notes:** The note `skos:editorialNote` is used for editorial comments, such as on country names. This type of note is also used for adding the author of a species, for example "Hordeum bogdanii" with `skos:editorialNote` "Author: Wilensky". See the AGROVOC Editorial Guidelines, Second edition for details on adding author names for organisms.

Other guidelines for author names include:

- Use standard abbreviations of author names, if existing, as given in the authoritative resources, for example "Hordeum bogdanii" with `skos:editorialNote` "Author: Wilensky" or "Hordeum vulgare" with `skos:editorialNote` "Author: L".

- List the author for the preferred scientific name only.

- An authority in parentheses indicates that the species has changed since the original authority described it. If the author of the current name is different from the author of the species itself, e.g. a species has been moved to another genus, the original author is given in parentheses, followed by the current author, for example "Abies lasiocarpa" with `skos:editorialNote` "Author: (Hook.) Nutt".

For animals, follow the conventions given in the International Code of Zoological Nomenclature. Use the format "Author: Surname, Year". Author names are not abbreviated, for example "Spodoptera frugiperda" (Smith, 1797). In `skos:editorialNote` "Author: (Smith, 1797)". Note that the author is in parentheses, as it was originally "Phalaena frugiperda". Another example is "Capra ibex" Linnaeus, 1758. In `skos:editorialNote` "Author: Linnaeus, 1758". Note that no parentheses are used here, but the comma is followed by authority year.

For bacteria, follow the conventions given in the International Code of Nomenclature of Prokaryotes. Use the format "Author: Surname, Year." Author names are not abbreviated. The citation of a new combination should include the name of the original author in parentheses followed by the name of the author who proposed the new combination and the year of publication of the new combination. Authorities and dates are not required for viruses and viroids.

> **Scope note:** The note `skos:scopeNote` is used to explain the application of a term and to indicate limitations or extensions of the term meaning. Some examples for scope notes are:
>
> - For "consistency", the scope note reads "Restricted to the physical property".
> - For "agricultural sector", the scope note indicates "Includes fishery and forestry sectors".
> - For "growth rate", the scope note explains "Restricted to the biological phenomenon; in economics use `:c _ 29767`".
>
> **History note :** The note `skos:historyNote` can be used to provide more details for the editorial history. Some examples for history notes are:
>
> - For "Eswatini", the history note explains "The country name was changed from the former name of the Kingdom of Swaziland (former short form: Swaziland). Effective date: 19 April 2018."
> - For "Balistes capriscus", the history note indicates "Previously Balistes carolinensis Gmelin, 1789 (synonym)".

4.4 Agrontology

AGROVOC uses a specific vocabulary of relations called "Agrontology", a support ontology for AGROVOC, and a Web Ontology Language (OWL) vocabulary. When these properties are applied consistently and at scale, it will also enhance the impact of AGROVOC in semantic context. The URI of the Agrontology ontology is: http://aims.fao.org/aos/agrontology and its namespace is http://aims.fao.org/aos/agrontology#.

Agrontology properties illustrate relationships: causative, partitive, process, spatial, taxonomic. For example,"Olea europaea" `produces` "olives", `hasPest` "Bactrocera oleae" and `hasPathogen` "Xylella fastidiosa" (see Figure 8). More examples of these domain-specific relations between concepts are `hasProperty/isPropertyOf` and hasComponent/isComponentOf. Most are concept-to-concept relationships, some are term-specific.

Figure 8. Example of Agrontology properties for the concept "Olea europaea" shown in Skosmos

Source: FAO. 2022b. AGROVOC Skosmos browser. Cited 3 November 2022.
https://agrovoc.fao.org/browse/agrovoc/en/

Concept-to-concept relationships can be either symmetric or asymmetric. Symmetric properties for concept-to-concept relations only need to be added in one direction to be shown symmetrically in Skosmos, but they will not be visible symmetrically in VocBench. The inferred information is available in SPARQL Protocol and RDF Query Language (SPARQL) queries, published AGROVOC datasets, Loddy and in Skosmos. For example, after adding the relationship in VocBench that "hand hygiene" `prevents` "disease transmission", in the next release of AGROVOC, Skosmos will indicate that "disease transmission" `IsPreventedBy` "hand hygiene". Other properties are not symmetric, such as M49code. In Unit 5, the lesson "Adding relationships between concepts within AGROVOC: Agrontology" explains how Agrontology properties are implemented using VocBench.

Most Agrontology properties are concept-to-concept. Some are label-to-label relations within a concept, such as `hasSynonym`. For example, `:c_1145` "Bulgaria" has the English label xl_en_1299522430729 "Bulgaria" (the formal short name), which `hasSynonym` "Republic of Bulgaria" (the formal long name) and `hasOldName` "People's Republic of Bulgaria". Label-to-label relations are visible in VocBench, SPARQL queries, Loddy and published AGROVOC datasets, but not in Skosmos. Definitions for selected Agrontology properties are available in its OWL file and VocBench. Look in Skosmos or VocBench for examples of how Agrontology properties have been used, and be consistent.

Below is a short list of selected Agrontology properties.

processRelationship

usesProcess/isProcessFor

isUsedIn/makeUseOf

hasGoalOrProcess/isAchievedByMeansOf

hasObjectOfActivity/isObjectOfActivity

isStudiedBy/study

causativeRelationship

affects/isAffectedBy

afflicts/isAfflictedBy

causes/isCausedBy

hasDisease/isDiseaseFor

hasHost/isHostFor

hasPathogen/isPathogenOf

hasPest/pestOf

hasProduct/productOf

hasProperty/isPropertyOf

hasSymptom/indicates

IsDerivedFrom/isSourceOf

isMadeFrom/isUsedToMake

isPreventedBy/prevents

isProducedBy/produces

quantitativeRelationship

isMeasuredBy/measures

spatialRelationships

isSpatiallyIncludedIn/spatiallyIncludes

surroundedBy/surrounds

taxonomicRelationship

hasTaxonomicRank/isTaxonomicRankOf

hasTaxonomicConcept/
hasCommonNameConcept

partitiveRelationship

hasPart/isPartOf

compose/isComposedOf

hasComponent/isComponentOf

hasMember/isMemberOf

hasType/TypeOf

includes/includedIn

skosxl:labelRelation
(Label-to-label relationships)

hasSynonym/hasSynonym

hasAcronym/isAcronymOf

hasOldName/isOldNameOf

hasScientificName/scientificNameOf

hasSymbol/isSymbolFor

skos:notation

hasCodeISO3Country

M49code

Scientific names

Scientific names

Scientific names are usually written in the Latin alphabet (scientific names are Latinate words, meaning it is not a Latin word but is Latinized). However, they may be also transliterated in different alphabets. Scientific names for virus species do not follow the Linnaean system. A virus may have a non-Latinate scientific name (e.g. "Coconut cadang-cadang viroid") that does not follow the usual two-part genus–species system. In AGROVOC, scientific names do not use italics. The names of the ranks above species, such as families and orders, start with a capital letter (e.g. "Eukaryota", "Animalia" and "Chordata").

> Common names and scientific names should be kept in separate hierarchies wherever possible, unless a scientific name is used as a common name. Scientific or common names of animals, plants and fungi may be preferred terms depending on the hierarchy in which the common names or scientific names are placed. Scientific and common names of viruses and bacteria are not kept in separate hierarchies. If adding scientific or common names, the corresponding common or scientific name should also be added, with links between them. It may be necessary to add the rank above and then the new concept. The common name and scientific name should be linked by means of the concept-to-concept property `hasTaxonomicConcept/hasCommonNameConcept` to explain, for example, that "banteng" `hasTaxonomicConcept` "Bos javanicus" or that "Apis mellifera" `hasCommonNameConcept` "honeybees". This should not be confused with the label-to-label relationship `hasScientificName/scientificNameOf`, which is only used inside a concept. See lesson 5.8 on the Agrontology.

Scientific names should not be used as non-preferred terms in the common name hierarchy. However, there are a few exceptions to this rule, such as cases where common names and scientific names can be found together.

> For scientific names, the taxonomic rank must always be added for organisms, for example "Apis mellifera" `hasTaxonomicRank` "species (taxa)". Authors of a species or genus should be added where available as an editorial note (see 4.7 Notes), for example "Caudiverbera caudiverbera" `skos:editorialNote` "Author: (Linnaeus 1758)". This information is useful for disambiguation. For the format of the author citation, please follow the conventions of the relevant science discipline. Additional information on a scientific name, such as the source citation, will be available in other resources.

Aligning concepts with these authoritative resources is very important, as it helps ensure that the correct and current name is used, such as "Ochotona" (author: Link, 1795), not the synonym "Tibetolagus" (author: Argyropulo, 1948), to avoid concept duplicates and to support linked open data efforts. Before adding scientific names, check authorities lists to make sure the correct name is added (not a synonym or an old name). If necessary, a synonym might be added as an altLabel. AGROVOC focuses on scientific names of organisms relevant for its areas of interest, mainly food, agriculture, forestry and fishery. For organisms in general, more specialized resources are available, see AGROVOC Editorial Guidelines (FAO, 2022).

The checklist for adding a new scientific name is (* means mandatory):

- Verify that the organism is in scope for AGROVOC (i.e. has relevance for agriculture, fisheries, forestry, horticulture or economics), such as food, feed or pest, or has an important ecological function.*

- Verify the name with the trusted authority that suggested its current, accepted name.*

- Check that a synonym of the concept does not exist in AGROVOC.*

- Add the scientific name as a new concept. Add the taxon (Agrontology property hasTaxonomicRank).*

- Add the author using skos:editorialNote. Add the alignments, for example to GBIF or NALT.

- Add the Agrontology relation to or from the common name (i.e. Agrontology property has`TaxonomicConcept/ hasCommonNameConcept`). If the common name does not exist, evaluate if it is needed as a separate new concept (applies to animals, plants and fungi but not viruses).

Subvocabularies within AGROVOC

6

Subvocabularies within AGROVOC

Subvocabularies in AGROVOC are achieved by creating a scheme containing a subset of AGROVOC concepts. Since 2019, and with the collaboration of the Artificial Intelligence (ART) Research Group at Tor Vergata University (Italy), the management of specialized concept schemes is possible within AGROVOC. VocBench 3 supports the use of hierarchical relation properties that are specific to a scheme. This opens for interesting collaboration possibilities with specialized communities: they can embed their controlled vocabularies within AGROVOC and benefit from the AGROVOC infrastructure and expertise of the editorial network, while maintaining options for separate displays and exports. Shared concepts used by any of the schemes are part of the AGROVOC Thesaurus and have AGROVOC URIs. This means that expert communities can now curate a topic within AGROVOC, enriching AGROVOC with specialist knowledge, with modern infrastructure to share this as part of the AGROVOC Linked Open Data structure (FAO, 2021). Through semantic technologies, their research becomes more visible and accessible.

There are two main possible scenarios regarding the creation of a scheme:

1) An institution or community of experts with expertise in and a mandate for a specific subdomain relevant to AGROVOC proposed the creation of a new scheme in AGROVOC. They commit to select and organize existing relevant AGROVOC concepts and suggesting new concepts. In this case, the institution or community of experts use AGROVOC as a foundation to create either a subset or an extension that covers their domain.

2) An institution or community of experts with expertise in and a mandate for a specific subdomain relevant to AGROVOC already has a vocabulary and proposes to integrate it into AGROVOC, reusing existing AGROVOC concepts, when possible, and adding missing ones by implementing the hierarchy of their original vocabulary. To date, this has been the most common scenario.

The basic criteria for accepting a subvocabulary include:

- The domain should be relevant to AGROVOC, and its scope should be well defined.
- It is important to note that each concept always belongs to the main scheme (AGROVOC) and it must be in a specific place within the AGROVOC hierarchy. However, each scheme might want to use different hierarchy models.
- The institution that takes responsibility for a subvocabulary should have recognized expertise and a mandate to cover the related topic.
- A curator should be designated for the new scheme.
- All schemes must follow the AGROVOC Editorial Guidelines.

Interested expert communities are welcome to contact FAO (agrovoc@ fao.org) for more details.

Subvocabularies are part of AGROVOC. These can have different hierarchies, but have some shared infrastructure, so all concepts use the same AGROVOC Uniform Resource Identifier (URI), translations and definitions. Do not think of the subvocabulary as an island. A concept in a subvocabulary cannot exist outside AGROVOC. Subschemes are a valuable part of AGROVOC, but shared understanding is needed to leverage the collaborations.

Basic principle: add suggested new concept to AGROVOC, following AGROVOC guidelines, then add to subvocabulary, as a second step.

Each subscheme handles hierarchy a little differently, but this is very important: when an editor is modifying a concept (like adding or changing a translation), the editor is not editing data only for that scheme; the editor is editing the data associated with a concept, so changes will be seen in all schemes containing the concept. For example, it is better not to modify definitions or terms of LandVoc concepts without talking to the scheme coordinator, as some definitions are the result of technical discussions and can be sensitive.

Currently, there are five subvocabularies in AGROVOC (2022):

1) LandVoc. The LandVoc Thesaurus is a set of 310 concepts about land governance created and maintained by the Land Portal Foundation as a distinct concept scheme within AGROVOC (see Figure 9). The vocabulary was started independently and then merged into AGROVOC in 2017. Most concepts were already in AGROVOC, but they were scattered throughout the AGROVOC hierarchy. For instance, the concept "land stakeholders" is embedded two levels under the AGROVOC top concept "groups" and the concept "land governance" is embedded four levels under "activities". For LandVoc, "land stakeholders" and "land governance" are both top concepts. LandVoc reuses AGROVOC concepts and re-structures them into a hierarchy designed for people working on land tenure, land management and land governance. In addition, LandVoc has added new land governance concepts to AGROVOC. LandVoc is a subvocabulary in AGROVOC. It uses a custom hierarchy, and the URIs are AGROVOC URIs. LandVoc Skomsos: https://explore.landvoc. org/landvoc/en

Figure 9. LandVoc Skosmos shown in Skosmos

Source: Land Portal Foundation. 2022. LandVoc Skosmos browser. Cited 10 October 2022. https://explore.landvoc.org/landvoc/en/

2) ASFA. The ASFA Thesaurus is an indexing and searching tool. It contains the subject descriptors used to index the content of the Aquatic Sciences and Fisheries Abstracts (ASFA) Bibliographic Database. It covers the world's literature on the science, technology, management, and conservation of marine, brackish water, and freshwater resources and environments, including their socio-economic and legal aspects. A number of concepts from the thesaurus had already been mapped to AGROVOC while the two thesauri were maintained independently. Since 2019, aquatic sciences and fisheries concepts from ASFA are enriching AGROVOC. ASFA has been integrated in AGROVOC as a subvocabulary, managed in VocBench. It uses a custom hierarchy, and the URIs are AGROVOC URIs (see Figure 10). ASFA Skomsos: https://agrovoc.fao.org/skosmosAsfa/asfa/en

Figure 10. ASFA Skosmos

Source: FAO. 2022c. ASFA Skosmos browser. Cited 3 November 2022.
https://agrovoc.fao.org/skosmosAsfa/asfa/en/

3) FAOLEX. FAOLEX is a database of national legislation, policies and bilateral agreements on food, agriculture and natural resources management. It currently contains legal and policy documents drawn from more than 200 countries, territories and regional economic integration organizations in over 40 languages. The FAOLEX subvocabulary in AGROVOC has the option of a custom hierarchy, and the URIs are AGROVOC URIs (see Figure 11). FAOLEX Skomsos: https://agrovoc.fao.org/skosmosFaolex/faolex/en

Figure 11. FAOLEX Skosmos

Source: FAO. 2022d. FAOLEX Skosmos browser. Cited 3 November 2022. https://explore.landvoc.org/landvoc/en/

4) One CGIAR. CGIAR is a global research partnership for a food secure future dedicated to reducing poverty, enhancing food and nutrition security, and improving natural resources. Launched in 2021, the FAO and CGIAR collaboration on increasing interoperability between food and agricultural information systems provides an opportunity for CGIAR to suggest new concepts and terms to the FAO AGROVOC thesaurus. The One CGIAR subvocabulary in AGROVOC uses a custom hierarchy, and the URIs are AGROVOC URIs (see Figure 12). One CGIAR Skosmos: https://agrovoc.fao.org/skosmosOneCGIAR/cgiar/en

Figure 12. One CGIAR Skosmos

Source: FAO. 2022e. ONE CGIAR Skosmos browser. Cited 10 January 2022. https://agrovoc.fao.org/skosmosOneCGIAR/cgiar/en/

5) FAO Indigenous Peoples. A subvocabulary containing concepts related to Indigenous Peoples, coordinated by the FAO Indigenous Peoples Unit. Language is a powerful tool for visibility. The language of Indigenous Peoples' rights is evolving, and coherence of terminology is essential.

Indigenous Peoples Skosmos: https://agrovoc.fao.org/skosmosIndigenousPeoples/IndigenousPeoples/en.

Although FAO facilitates the technical maintenance and publication of the whole of AGROVOC, the infrastructure is flexible. While institutions that do not have the necessary technical infrastructure can rely completely on AGROVOC services like Skosmos and the SPARQL endpoint, other institutions can decide to use their own browsing interface or their own triple store.

ASFA and LandVoc are examples of two different approaches:

1) **ASFA** uses all the features of the AGROVOC infrastructure, and its browsing interface is provided by the AGROVOC Skosmos platform. The ASFA Skosmos interface displays only the ASFA scheme, and only shows the ASFA hierarchic relationships, see Figure 13.

2) **LandVoc** is used in the Land Portal website for indexing and browsing content. The Land Portal administrators curate the LandVoc content in the AGROVOC VocBench, which is regularly downloaded in Resource Description Framework (RDF). The Land Portal also uses its own SPARQL endpoint and browsing interface.

Subvocabularies or schemes can be downloaded independently. The institution that curates a scheme may provide a dedicated download. Otherwise, the scheme can be downloaded using SPARQL queries.

Figure 13. The concept "thesaurus" shown in AGROVOC Skosmos (left) and ASFA Skosmos (right): same concept, different location hierarchy

Source: FAO. 2022b. AGROVOC Skosmos browser and FAO. 2022c. ASFA Skosmos browser. Cited 3 November 2022. https://agrovoc.fao.org/browse/agrovoc/en/ and https://agrovoc.fao.org/skosmosAsfa/asfa/en/

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Glossary

Agrontology
Specific vocabulary of non-hierarchical relations developed for AGROVOC, grouped under `skos:related`.

Concept
Concepts may cover any subject: an animal, a plant, a geographical region, a chemical element, a technique, etc. Operationally, a concept is a set of terms used in any language to describe the same idea.

> "intensive farming"@en
>
> "Explotación agrícola intensiva"@es
>
> "agriculture intensive"@fr

Hierarchical relations between concepts
Concepts are organized hierarchically by means of the relations `skos:broader` (BT) and its inverse `skos:narrower` (NT). The relation can be generic between a category and its members, such as "birds" `skos:narrower` "parrots", where the biological order "parrots" is one of the members of the class "birds".

Another hierarchical relation is between the whole and its parts. For example, "blood vessels" `skos:narrower` "blood veins" and "arteries". In some cases, the relation is instantial (i.e. refers to a particular instance). For example, "mountain ranges" `skos:broader` "Alps" or "Apennines".

Loddy
The LOD version of AGROVOC is in RDF/SKOS-XL, and is stored in Apache Jena Fuseki triple store (data is accessible to machines through a SPARQL endpoint, and to humans by means of HTML pages generated with Loddy). Loddy is the tool used to provide URI resolution to AGROVOC URIs. Its reply depends on the tool being used to access its data.

Non-preferred term
All the alternative terms to name a concept in any given language are called non-preferred terms. For example, "agrosilvicultural systems" and "farm forestry" are non-preferred terms in English, which are used for concept `:c _ 207` (the preferred term is "agroforestry") .

Preferred term

For each concept, in each language, one term is preferred and represents a single concept. The decision of which term should be preferred usually depends on its domain and its accepted conventions. For example, "agroforestry" is the preferred term in English for the concept `:c _ 207`.

Simple Knowledge Organization System (SKOS)

SKOS is a World Wide Web Consortium recommendation designed for representation of thesauri, classification schemes, taxonomies, subject-heading systems or any other type of structured controlled vocabulary. SKOS is part of the Semantic Web family of standards built upon Resource Description Framework and Resource Description Framework Schema, and its main objective is to enable easy publication and use of such vocabularies as linked data (https://en.wikipedia.org/wiki/Simple_Knowledge_Organization_System).

SKOS concept scheme

A SKOS concept scheme is an aggregation of one or more SKOS concepts (www.w3.org/TR/skos-reference).

Term

A term is a word or set of words used to name a concept in any given language. For example:

"zrno kukuřice"@cs, "maize", "Maíz"@es and "Mais"@it;

"मकका"@hi "kukorica"@hu, "სიმინდი"@ka, "Jagung"@ms and "Kukurydza (ziarno)"@pl;

"milho"@pt, "porumb"@ro, "kukurica siata"@sk and "玉米"@zh.

Uniform Resource Identifier (URI)

A URI is a string of characters used to identify a name or a resource on the internet. The most common form of a URI is the web page address, which is a particular form or subset of URI, called a Uniform Resource Locator (URL). In SKOS, concepts are formalized as `skos:Concept` and identified by dereferenceable URIs. For example, http://aims.fao.org/aos/agrovoc/c_12332 is the URI of the concept "maize", "corn (maize)", "maïs"@fr, etc. AGROVOC URIs are automatically generated by VocBench.