**Scope Notes for GACS Thematic Classification**

*First draft September 11, 2017*

Purpose of the GACS Thematic Classification

* To enable users of GACS to view terms by subject areas or disciplines
* To collect terms in a subject area that may be of interest to specialists which are separated in the strict Hierarchical arrangement of GACS

The classification scheme used was derived from the Unified Agriculture Thesaurus Project UAT, which was a joint project between CABI, NAL and FAO concluded in 1999. It was constructed to accommodate the indexing vocabulary of the databases produced by the three organizations but it has features in common with other knowledge classifications. CABI published the hierarchical classification in 1999. The classification has been adapted for GACS and remains hierarchical multilevel with two-letter codes used to designate specific groups within the upper classification.

Brief view of upper Classification Scheme applied to GACS:

*Two-*

*Letter*

*Code Classification Heading*

CA GENERAL

FA PHYSICAL SCIENCES

JA EARTH SCIENCES

LA LIFE SCIENCES

PA APPLIED SCIENCE AND TECHNOLOGY

WA SOCIAL SCIENCES AND HUMANITIES

Each concept in the GACS is assigned at least one category. Since the classification is not strict, terms can be placed in more than one category. In general, the codes for the upper classification are not used since a more specific code is applied.

eg, Concept of “forestry equipment” may be in two categories:

SR Forestry

TN Equipment

The purpose of this document is to give guiding Scope Notes for each category to future maintainers of the GACS vocabulary. As this work evolves, the documentation can be updated to reflect current opinion and guidance. Examples of Concepts sorted into the classification are given.

<Do we want to insert SKOS example here?>

<May want to insert the frequency distribution numbers across categories here, with date>

**Full view of Classification Scheme applied to GACS**

**CA GENERAL**

CC common terms

CE named organizations

CG named regions and countries

CJ named physiographic features

CL research

CN methodology

CQ mathematics and statistics

CS computer science

CU communication and information

**FA PHYSICAL SCIENCES**

FD physics

. FG physics by discipline

. FJ physical states

. FM physical phenomena

. FP physical properties

GA chemistry

. GD chemistry by discipline

. GG chemical and physicochemical processes and phenomena

. GJ chemical and physicochemical properties

. GM chemical combination and structure

. GP chemical analysis

. HA chemical substances

. HB chemicals

. HC fundamental chemical entities

. HG chemical substances by role

. HJ chemical substances by use or effect

. HM chemical substances by property

. HP chemical elements and compounds

. HQ elements

. HT inorganic compounds

. HW organic compounds

. HY organic/inorganic compounds

**JA EARTH SCIENCES**

JC geology

JF geomorphology

JJ soil science

JM hydrology

JP oceanography

JS meteorology and climatology

JV geography

**LA LIFE SCIENCES**

LC biology

. LE microbiology

. LF mycology

. LG botany

. LH zoology

. LI cytology

. LJ embryology

. LK molecular biology

. LM hydrobiology

. LN limnology

. LP palaeontology

. LQ biophysics

. LR biochemistry

. LS physiology

. LT genetics

. LU evolution

. LV biological structure and form

. LW taxonomy

. LX natural history

MA ecology

. MC ecology by discipline

. MD biogeography

. MG ecological processes and phenomena

. MJ levels of ecological organization

. MK environments and habitats

. ML environmental factors

MN behaviour and psychology

. MS behaviour

. MV psychology

NA organisms

. NC organisms, by non-taxonomic groups

. NE organisms, taxonomically arranged

. NH prions

. NK viruses

. NN prokaryotes

. NQ fungi

. NT plants

. NW animals

. NY organisms of uncertain taxonomy

. NZ organisms by alternative taxonomic schemes

**PA APPLIED SCIENCE AND TECHNOLOGY**

PC health and pathology

PD health and pathology by discipline

PE health and pathology institutions

PF diseases

PG health hazards

PH pathogenesis

PK host resistance and properties of pathogens and pests

PL diagnosis and diagnostic techniques

PM epidemiology

PQ health

PR health protection

PS pharmacology and toxicology

PU applied human and animal nutrition

PW characteristics of foods and feeds

PY diet and feeding

SA applied genetics and breeding

SC genetic resources

SD genetic resources management

SE breeding

SF breeding performance evaluation

SG genetic techniques

SJ agriculture, forestry and fishery

SL agriculture

SM soil management for plant production

SQ plant production

SR forestry

SS animal production

ST aquaculture

SU fishery

SV insect keeping and management

SW vermiculture

SX products

TA environment and natural resource management

TC environmental management

TD environmental degradation

TF pollution and pollutants

TG resource management

TJ technology and engineering

TL materials

TM facilities and structures

TN equipment

TQ materials handling

TR processing

TS transport

TT engineering

TV technology

TW energy and power

**WA SOCIAL SCIENCES AND HUMANITIES**

WC social sciences

WE education

WF sociology

WG social welfare

WJ policy, politics, government and law

WK management science

WL economics

WN culture and humanities

WQ arts

WR culture

WS history

WV leisure and recreation

WW tourism

WY philosophy and ethics

**Scope Notes**

*Examples of concepts assigned to the category are in italics.*

**CA GENERAL -** interdisciplinary and applicable to most branches of research.

**CC common terms** – general processes, properties and characteristics, e.g.

* *deterioration, swelling, incidence, expansion, depletion*
* *weight, height, size, volume, mass, area*
* *temporal variation, spatial variation, timing*
* *incompatibility, quality, sustainability, efficacy, use value*

**CE named organizations** – Specifically named organizations (Proper Nouns), e.g.

* *United Nations, World Health Organization*
* *European Union, World Bank, World Trade Organization*

For general unnamed groups of organizations, USE WF sociology

**CG named regions and countries** – specifically named regions (Proper Nouns) including continents, countries, island groups, geographical areas, historical regions, country groups, states or provinces, e.g.

* *Antarctica, South America*
* *Japan, Uganda, Italy, Turks and Caicos Islands*
* *Africa South of Sahara, East Asia, Arab countries*
* *Virginia, Lorraine, Gibraltar, Shaanxi, Corsica*

For general land regions, USE JV geography

**CJ named physiographic features –** specifically named physiographic features (Proper Nouns) including mountains and mountain ranges, bodies of water, bays, deltas and deserts, e.g.

* *Bay of Bengal, Mediterranean Sea*
* *Sahara desert, Alps*

For general physiographic features, SEE MK environments and habitats

For ecosystems, SEE MJ levels of ecological organization

For climatic zones, SEE JV geography

**CL research –** including research facilities, types of research, organization of research, funding of research, research practices and processes, research policy, general research methods, e.g.

* *Arboreta, laboratories, experimental stations, zoos*
* *Research projects, diffusion of research, field experimentation*
* *Biomedical research, dairy research, cooperative research*
* *Surveys, plant collections, case studies, species trials*

**CN methodology** – including laboratory procedures and protocols, modeling, specific techniques used in chemical and biological analysis, testing procedures, and processes, e.g.

* Blood sampling, embryo culture, trapping, strength testing
* ELISA, scanning electron microscopy, GC-MS, SDS-PAGE
* Rapid methods, impact assessment, surveillance, projections

**CQ mathematics and statistics –** including subdisciplines of mathematics, statistics, statistical methods, mathematical constructs, types of data, e.g.

* *Equations, normal values, ratios*
* *algorithms, Monte Carlo method, fuzzy logic, kriging*
* *Statistical uncertainty, statistical bias, correlation*
* *Hydrological data, indexes, aggregate data, geostatistics*

**CS computer science –** including subdisciplines of computer science, computer equipment, software, computer techniques, e.g.

* *Microcomputers, computer software*
* *Neural networks, artificial intelligence*
* *Computer graphics, computer analysis*

**CU communication and information –** including forms of human communication, mass media, publication types, communication practices, information dissemination, information systems, sources and facilities, e.g.

* *Biographies, test reports, historical records, photographs, directories*
* *Journalism, internet, nutrition information, telecommunications*
* *Misinformation, information retrieval, nutrient databanks, communication skills*

**FA PHYSICAL SCIENCES –**chemical elements and substances, matter, energy, their structure and properties and how they interact with each other (motion, force, reactions)

**FD physics** –matter, energy, motion, force

**FG physics by discipline – suggest combining with FD**

* *Mechanics, ultasonics, kinematics*

**FJ physical states**

* *Gases, liquids, solids, crystals*

**FM physical phenomena**

* *Evaporation, adhesion, temperature, light*

**FP physical properties**

* *Electrical properties, heat stability, texture, flow resistance*

**GA chemistry –** chemical elements, chemical substances and their structure, properties, reactions

**GD chemistry by discipline – suggest combining with GA**

* *Crystallography, food chemistry*

**GG chemical and physicochemical processes and phenomena**

* *Hydrolysis, combustion, deploymerization*

**GJ chemical and physicochemical properties**

* *Salinity, water solubility, aggregate stability, half life, biodegradability*

**GM chemical combination and structure –** primary, secondary and tertiary structures of chemicals, parts or features of chemical structures

* *Active sites, protein subunits, isomers, protein conformation*

**GP chemical analysis -** methods for chemical analysis and chemical composition results

* *Nitrate nitrogen, carbon nitrogen ratio, moisture content, total solids*
* *Headspace analysis, titrimetry*

**HA chemical substances**

**HB chemicals - suggest combining with HA**

**HC fundamental chemical entities**

* *Ions, isotopes, radicals, ligands, protons*

**HG chemical substances by role**

* *Leachates, pesticide residues, solutes, extracts*

**HJ chemical substances by use or effect**

* *Adhesives, acaricides, dyes, drugs, endocrine-disrupting chemicals, buffers*
* *Lindane, abamectin, norflurazon, bromacil, DDT*

**HM chemical substances by property**

* *Alkalis, polyesters, volatile compounds, electrolytes*

**HP chemical elements and compounds**

**HQ elements -** elements of the periodic table and element groups, e.g.

* + *Carbon, iodine, lithium, sulfur, radium, transition elements*

**HT inorganic compounds -** compoundsgenerally not containing carbon, but simple compounds like carbon monoxide and carbonates, carbides, cyanides are considered here**.**

* + *Oxides, carbonates, fluorides, nitric acid*

**HW organic compounds -** compounds containing carbon, e.g.

* + *Ketones, lactic acid, pyridines, fatty acid esters, hydrocarbons*

**HY organic/inorganic compounds**

* + *Salts, acetates, sulfides*

**JA EARTH SCIENCES – study and description of the Earth system including the land, atmosphere, water bodies and their changes over time.**

**JC geology -** earth’s composition and physical structure and the processes that act on it

* *Erosion, weathering, sediment yield*
* *aquifers, landslides, kaolinite, rocks*

**JF geomorphology -** physical features of the surface of the earth

* *rivers, glaciers, watersheds, islands, caves, topography*

**JJ soil science –** formation, composition, ecology, biology and classification of soils

* *humus, A horizons, clay fraction*
* *field capacity, seepage, soil pH, soil texture, macropore flow*
* *polluted soils, upland soils, disturbed soils, andosols*
* *soil transport processes, leaching, percolation*

**JM hydrology –** properties of the earth’s water and its movements, classifications

* *water hardness, polluted water, saline water*
* *runoff, sediment transport, salt water intrusion, stream flow*
* *tsunamis, hydrological cycle*

**JP oceanography** - physical and biological properties and phenomena of the oceans

* *tides, ocean currents*

**JS meteorology and climatology -** processes, properties, components and phenomena of the atmosphere and changes over time, seasons, climate.

* *Sunshine hours, fog, lightning*
* *Weather control, insolation, advection*
* *Monsoon season, autumn, tropical climate*

**JV geography -** places on the earth and relationship to human population, e.g.

* *Agroecological zones, latitude, volcanic areas*
* *Exclusive economic zones, less favoured areas*

**LA LIFE SCIENCES**

**LC biology** - properties of organisms, sub-disciplines, biological phenomena and processes, e.g.

* *Biological properties, adiposity, animal fertility, plant age, lodging resistance*
* *Radiobiology, biomonitoring, shade tolerance*

For properties of hosts/pathogens SEE PK host resistance and properties of pathogens and pests

**LE microbiology** - properties and processes associated with microorganisms and viruses, e.g.

* + *Bacterial colonization, microbial load, microbial activities*
  + *Mycology, food microbiology*

For groups and scientific names of viruses, SEE NK viruses

For groups and scientific names of bacteria, SEE NN prokaryotes

**LF mycology** - structures, characteristics, phenomena and processes associated with fungi, e.g.

* + *Ectomycorrhizae, plant pathogenic fungi, hyphae, basidia*

For fungal groups and scientific names, SEE NQ fungi

**LG botany** - structures, characteristics, phenomena and processes associated with plants, e.g.

* + Ethnobotany, weed biology, plant exploration and collection,
  + plant micronutrients, alpine plants, plant characteristics, roots, cambium

For plant groups and scientific names, SEE NT plants

**LH zoology** - structures, characteristics, phenomena and processes associated with animals, e.g.

* + nematology, entomology, insect behavior, animal taxonomy
  + skeleton, lymphatic system, arteries, zoogeographical regions

For animal groups and scientific names, SEE NW animals

**LI cytology** - structures, characteristics, phenomena and processes associated with cells, e.g.

* + cell respiration, cell viability, cell death, membrane fluidity, extracellular matrix
  + cytoplasmic inclusions, cell division, blood cells, cultured cells

**LJ embryology** – consider removing

* + *embryonic mortality, embryo transfer, somatic embryos*

**LK molecular biology** - consider removing since somewhat redundant with LT genetics

**LM hydrobiology** - consider removing

**LN limnology** - consider removing

**LP palaeontology** - consider removing

**LQ biophysics** - consider removing

**LR biochemistry** –biomolecules (enzymes, proteins, hormones) that are not classified in the chemical substances (HA) section, biochemical processes and reactions, properties of biomolecules, e.g.

* + *isoflavones, oxidoreductases, semiochemicals, blood proteins*
  + *protein synthesis, gluconeogenesis, enzymatic reactions*

For physiological processes of organisms, SEE LS physiology

**LS physiology** – functional processes and phenomena of organisms, subdisciplines, growth, physiological properties, e.g.

* + *hunger, growth, ingestion, lactation, menopause*
  + *morphogenesis, dormancy, ripening, aging*
  + *root growth, vernalization, photoperiodism, parthenocarpy*
  + *taste sensitivity, root hydraulic conductivity, maturation period*

For biological properties SEE LC biology

**LT genetics** – structures, phenomena and properties of heredity, cytogenetics

* + *DNA repair, RNA editing, ploidy, transfection, marker genes, tata box*
  + *Chromosome elimination, anaphase, stop codon, heterozygosity*

For genetic techniques and protocols, SEE SG genetic techniques*.*

**LU evolution** - consider removing

**LV biological structure and form** - anatomical structures of organisms, morphology, body fluids, exudates and excreta, morphological/developmental forms, body systems, e.g.,

* + *plant parts, legs, embryo sac, lymphatic system, skin, awns, skeletal muscle*
  + *Epicuticular wax, haemolymph, blood, semen, nectar*
  + *Seedlings, zygotes, heartwood, bulbs, fruiting bodies, spores, pith*

For cells and cell structures SEE LI cytology

For plant structures and forms SEE LG botany

For animal structures and forms SEE LH zoology

For fungal structures and forms SEE LF mycology

**LW taxonomy –** sub-disciplines, methods used for classification of organisms and explanation of genetic evolution and relatedness of organisms, biological nomenclature, e.g.

* + *Cladistics, morphotaxonomy, insect taxonomy, phylogeny, taxonomic keys*
  + *Subspecies, new genus, synonymy, validity, pathotypes*

**LX natural history - consider removing**

**MA ecology -** relationships of organisms in their environment and interactions of organisms, trophic levels, ecological processes and phenomenon, ecosystems, subdisciplines, e.g.

**MC ecology by discipline**

* *microbial ecology, community ecology*

**MD biogeography -** distribution and origin of species

* *Provenance, flora, fauna, phytogeography*

**MG ecological processes and phenomena -**

* *Trophic levels, autotrophs, stand development, species diversity*
* *Net ecosystem exchange, nitrogen balance, food chains, saprophytism*

**MJ levels of ecological organization**

* *Forests, savannas, colonies, benthos, alpine vegetation, plant strata*
* *Age structure, population characteristics, population pressure*

**MK environments and habitats –** including natural land types, habitats, and manmade areas, e.g.

* *Nature reserves, common lands, forest borders, landfills, neighborhoods*
* *Oviposition sites, niches, tree cavities, aquatic habitat*
* *Sloping land, highlands, fens, flooded land, pelagic environment*

**ML environmental factors -** describing the environment

* Darkness, edaphic factors, photoperiod, light regimes, water availability

**MN behaviour and psychology -** of animals and man

**. MS behaviour -** actions in response to situation or stimulus, e.g.

* *Risk behavior, dieting, fasting, rest, drug abuse, exercise*
* *Biting rates, oviposition, habits, grazing, territoriality, courtship, brooding*

**. MV psychology**

* *Incentives, attitudes, mental ability, decision making, emotions*
* *Problem solving, body image, anxiety, social values, public opinion*

**NA organisms**

**NC organisms, by non-taxonomic groups -** including developmental stages

* *Fingerlings, crops, weeds, ponies, livestock, game birds, genetically modified organisms*
* *Seed trees, laboratory mammals, woody plants, hosts, bonsai, forest pests*
* *Elderly, children, parasites, cestode larvae, oilseed plants, forbs, women, males*

**NE organisms, taxonomically arranged**

**. NH prions – consider removing**

**. NK viruses**

* *Pneumovirus, Hepatitis B virus, Rabies virus, dsRNA viruses*

**. NN prokaryotes -** including bacteria

* *Brucella, cyanobacteria, Mollicutes, Bordetella, Nostoc, Acetobacter*

For structures, properties and processes of microbes, SEE LE microbiology

**. NQ fungi**

* *Helotiales, Aphanomyces, Phytophthora, Mucor, Laccaria*

For anatomical structures, properties and processes of fungi, SEE LF mycology

**. NT plants**

* *Asparagus, Nicotiana, Crocus sativus, Liliales, Mentha, Oleaceae*

For anatomical structures, properties and processes of plants, SEE LG botany

**. NW animals**

* *Lizards, butterflies, squids, eagles*
* *Trichogramma, Lama, Psoroptes, Termitidae, Loxodonta, Ovis, Suidae*

For anatomical structures, properties and processes of animals, SEE LH zoology

**. NY organisms of uncertain taxonomy - consider removing**

**. NZ organisms by alternative taxonomic schemes – consider removing**

**PA APPLIED SCIENCE AND TECHNOLOGY**

**PC health and pathology**

**. PD health and pathology by discipline**

* *Parasitology, medical sciences, haematology, serology, ichthyology*

**. PE health and pathology institutions - consider removing**

* *Animal hospitals, nursing homes, intensive care units*

**. PF diseases -** including diseases, disorders, wounds, injuries, symptoms/signs of plants, animals and humans, including postharvest diseases, e.g.

* *Dementia, fowl diseases, obesity, malabsorption, skin lesions, tetanus, pus, paralysis*
* *Neoplasms, avian influenza, bacterial wilt, scald, vector-borne diseases, leaf blight*
* *Digestive system diseases, fish diseases, trace element deficiencies, albinism*

**. PG health hazards - consider removing**

* *Occupational hazards, falls, hazardous waste*

**. PH pathogenesis**

* *Acute course, relapse, mixed infections, pathological processes and conditions*
* *Latent infections, chronic course, complications (disease)*

**. PK host resistance and properties of pathogens and pests**

* *Immunity, susceptibility, allergic reactions, histocompatibility*
* *Host preferences, varietal resistance, glucose tolerance, frost resistance*

**. PL diagnosis and diagnostic techniques -** techniques and test results

* **Ultrasonic diagnosis, urine analysis, pregnancy diagnosis, blood platelet count**

For genetic techniques, SEE SG genetic techniques

For general methodology, SEE CN methodology

**. PM epidemiology -** incidence, distribution of diseases and disorders in populations and/or areas, e.g.

* *Neonatal mortality, familial incidence, pathogen survival, endemics*
* *Outbreaks, disease detection, disease prevalence, pathogen identification*

**. PQ health – consider removing**

* *Herd health, rural health, plant condition, wellness, health status*

**. PR health protection -** preventative and control methods, therapies, safety measures, etc., for the health protection of plants, animals and humans, e.g.

* *Fumigation, disinfestation, bed nets, brush control, phytotherapy, counselling*
* *Acupuncture, blood transfusion, food hygiene, patient care*
* *Immunization, resection, quarantine, radiotherapy, splenectomy*

**. PS pharmacology and toxicology** - adverse effects of agents, toxins, medicinal properties, toxicological processes, dosage and exposure, modes of action of drugs, e.g.

* *Acceptable daily intake, antineoplastic properties, hepatotoxicity, drug excretion*
* *Systemic action, mutagenicity, prescriptions, exposure duration, direct contact*

**PU applied human and animal nutrition**

* *Optimal nutrition, food preparation, hospital food service*

**. PW characteristics of foods and feeds –** food composition, food quality characteristics and nutritive value, e.g.

* *Food matrix, food nutrient losses, weaning feeds, meat grades*
* *Fruit quality, rancidity, peroxide value, protein digestibility*

**. PY diet and feeding -** special diets, feeding behavior, mealtimes, food intake, provision of food to animals and humans, nutritional guidelines, e.g.

* *Nutritional support, infant feeding, repletion, starter diets,*
* *Carbohydrate intake, high protein diet, dietary protein*
* *Healthy diet, diet recall, weight control programs, mixed grazing*

**SA applied genetics and breeding**

**. SC genetic resources -** including breeds, lines, hybrids, genetic relationships, ancestry, e.g**.**

* *Crossbreds, paternity, sisters, somatic hybrids, wild relatives,*
* *Isogenic lines, plus trees, introduced varieties*

**. SD genetic resources management – consider removing**

* *Gene banks, semen preservation, herdbooks*

**. SE breeding -** methods for genetic improvement or change, selection methods, e.g.

* *Backcrossing, in vitro selection, wide hybridization, protoplast fusion*

**. SF breeding performance evaluation - consider removing**

* *Progeny testing, breeding value, sire evaluation, germplasm screening*

**. SG genetic techniques**

* *DNA cleavage, northern blotting, DNA fingerprinting, microarray technology*
* *Restriction mapping, gene transfer, insertional mutagenesis, RNA probes*

**SJ agriculture, forestry and fishery**

**SL agriculture -** includingspecific types of agricultural systems, farming systems, agricultural land, farms, agricultural practices, e.g.

* Cooperative farming, nomadism, low input agriculture, silvopastoral systems,
* Gardens, rice fields, fish farms, good agricultural practices, feedlots, urban agriculture,

**SM soil management for plant production –** including tillage, irrigation and drainage, and activities to prepare the soil for planting, e.g.

* *Irrigation scheduling, fertigation, conventional tillage, mulching, watering, furrow irrigation*
* *Harrowing, liming, top dressings, furrows, seedbed preparation, irrigation rates*

**SQ plant production -** including plant propagation, plant husbandry practices, cropping systems, planting techniques, crop characteristics, harvesting and crop quality, e.g.

* Sequential cropping, scions, topworking, frost protection, line planting, shading,
* Harvest index, explants, planting date, fallow, cutting height, seed yield, mechanical harvesting

**SR forestry -** including silvicultural practices and systems, forest engineering and equipment, forest stands, forest mensuration, characteristics of forests and forest plantations, e.g.

* *Volume tables, agroforestry, afforestation, skidding, even aged stands*
* *Felling cycle, state forests, multiple use forestry*

**SS animal production -** including animal husbandry practices, animal characteristics, animal production systems, slaughterhouse practices, animal product yields and quality, dairy farming, e.g.

* *Stabling, egg production, carcass quality, animal manure management*
* *Fencing, farrowing rate, fleece weight, shoeing*

For animal products, SEE SX products

**ST aquaculture -** culture of fish, shellfish and other aquatic animals, aquatic plants, methods and equipment for production, harvesting and handling aquatic animals, fish ponds, e.g.

* Fish culture, seaweed culture, aquaculture techniques, mariculture

For aquacultural products, SEE SX products

**SU fishery -** fishing operations, planning and development of fisheries, stock assessment, fish surveys, equipment and fishing methods, e.g.,

* *River fisheries, fishery data, fishing nets, seining, fishing areas, line fishing*

For fishery products, SEE SX products

**SV insect keeping and management** - including apiculture and sericulture, husbandry methods, equipment, harvesting of insect products, e.g.

* *Hive management, brood rearing, hives, sericulture, apiculture*

For insect products, SEE SX products

**SW vermiculture** - consider removing, too specific

**SX products -** products and commodities, including animal and plant products, food and nonfood products, food supplements, byproducts, agricultural residues and wastes, e.g.

* **Maize, malt, seafoods, animal fibres, essential oils, sugar beet pulp**
* **Maize cobs, meat cuts, saffron, vegetable products, fortified foods**
* **Nuts, wheat starch, biodiesel, infant foods, milling byproducts**
* **Food grains, liquid milk, wines, carbonated beverages, cotton, sawnwood**

**TA environment and natural resource management -** including natural resources, e.g.

* *Land resources, environmental health, agricultural resources, environmental models*
* *threatened species, biological resources*

**. TC environmental management –** practices to protect the environment, e.g.

* *pollution control, ecological restoration, habitat conservation, remediation*
* *habitat improvement, environmental monitoring*

**. TD environmental degradation -** actions causing reduction in the environmental quality, e.g.

* *forest fragmentation, deforestation, desertification, soil degradation,*
* *algal blooms, soil acidification*

**. TF pollution and pollutants -** types of pollution, pollution sources and measure of pollution, e.g.

* *soil pollution, air quality, acid rain, point source pollution, oil spills*
* *industrial pollutants, radioactive pollutants, chemical oxygen demand*

**. TG resource management -** practices and activities to manage natural resources, assessment and measures of natural resource stocks, planning, e.g.

* *land consolidation, land use planning, wildlife conservation, water depletion*
* *energy management, water distribution, recycling, soil improvement, restocking*

**TJ technology and engineering**

**. TL materials**

* *green manures, lubricants, vaccines, probiotics, paints, diesel oil, powders*
* *food colourants, pig manure, thatch, wax coatings, ceramics, nanoparticles*

**. TM facilities and structures -** including buildings and manmade structures, societal infrastructure facilities, earthworks, parts of buildings, e.g.

* *poultry housing, farrowing pens, ponds, walls, child care centers, restaurants*
* *wastewater treatment plants, dairies, irrigation canals, floors, wineries, harbours*

**. TN equipment –** including hand tools, devices, mechanized equipment, parts and components, vehicles, laboratory equipment, kits, containers, e.g.

* *tractors, hitches, fishing gear, spray booms, food processing equipment*
* *kilns, tubes, heaters, mobile unites, cableways, filters, scanning electron microscopes*

**. TQ materials handling -** including packing, packaging and storage, e.g.

* *cold storage, loading, pumping, vacuum packaging, bottling, baling*

**. TR processing -** types of processing and processing treatments and techniques used for the conversion of raw materials, e.g.

* *biological treatment, air drying, grinding, cooling, aeration, flocculation*
* *dissolving, boning, processing stages, processing aids, continuous processes*

**. TS transport** - including all aspects of transportation, modes of transport, e.g.

* *sea transport, forest roads, food transport, space flight, navigation, traffic*

For vehicles, SEE TN equipment

**. TT engineering -**

* *cooling systems, maintenance, process control, visibility, construction*
* *ergonomics, electrification, agricultural hydraulics*

**. TV technology -**

* drilling, application methods, fire control, woodworking, dairy technology
* control methods, shipbuilding, hyperspectral imagery, communications technology

For food processing, SEE TR processing

**. TW energy and power**

* *electricity generation, bioenergy, energy consumption, fuel production*
* *nuclear energy, energy conversion, animal power*

**WA SOCIAL SCIENCES AND HUMANITIES**

**WC social sciences**

**. WE education –** educational levels, types of education, educational activities and training, education programs, educational institutions, e.g.

* *primary education, teachers, veterinary schools, teacher training, distance education*
* *educational technologies, youth programs, agricultural colleges, college students*

**. WF sociology** - including **–** including human groups, occupations, ethnic groups, social structure and organization, social institutions, social processes and phenomena, demography, e.g.

* *horticulturalists, indigenous peoples, stakeholders, food service workers*
* *social stigma, risk groups, human population, social unrest, human communities*

**. WG social welfare -** including social services and programs, health care services, food assistance programs, social security, e.g.

* *community health services, patients, nutrition policy, child welfare*

**. WJ policy, politics, government and law** - including laws and regulations, governance, legal rights, public administration, agreements and legal documents, politics, e.g.

* *food legislation, public administration, production policies, case law, EU regulations*
* *capitalism, law of the sea, product labelling, fishing rights, directives, political power*

**. WK management science -** business management, administrative activities and planning, organization of work, personnel management, work analysis, places of work, e.g.

* *work capacity, prioritization, production quota, farm planning, work study, production increase*
* *program development, working hours, project design, quality assurance, action plans*

**. WL economics –** economic activities and planning, prices and marketing, economic systems, finance, profits and margins, funding, acquisition, trade, insurance, industries, e.g.

* *market research, price support, consumer behavior, small businesses, farm results*
* *currencies, economic indicators, external debt, grants, variable costs, loans, poverty*

**WN culture and humanities**

**. WQ arts - consider removing, combining with WR**

**. WR culture -** including traditions, cultural institututions, anthropology, e.g.

* *cultural values, indigenous knowledge, museums, cultural environment*

**. WS history - consider removing, combining with WR**

**. WV leisure and recreation**

* *athletic fields, public parks, gardening, sport fishing, spectator events*

**. WW tourism - consider removing, combining with WV**

* *tourists, ecotourism, tourism policy, hotels, vacations, farm holidays*

**. WY philosophy and ethics – consider removing, combining with WR**

* *theory, bioethics, ethics, philosophy, value systems*