How to make your figures accessible

What is an alternative text?

Alternative text is the textual transcription of non-textual content in order to make it accessible to people with disabilities thanks to available technologies (reading materials and systems dedicated to audiences with disabilities, as well as reading devices for the general audience, such as speech syntheses).

The purpose of an alternative text is to convey the meaning or message of the illustration. Depending on the content of the image or the associated intention, it is not necessary to systematically decribe all the elements making up an image.

Alternative texts or descriptive texts?

There is a distinction between short texts (alternative texts) and long texts (descriptive texts).

Alternative text

Alternative text is a short text (< 145 characters), unstructured (consisting of a single paragraph without list, table, etc.). It describes the visual content (type of illustration — diagram, graphic, map, timeline, photograph, etc.) and gives its main characteristics (function — decorative or informative, etc.).

Descriptive text

Descriptive text is a complement to the alternative text. It can be long, complex and structured: enumeration, table... It aims to accurately describe the visual content.

The text should not be redundant with the title and caption (if redundancy = no descriptive text).

The style should be neutral and concise.

You are in the best position to describe what you want to show in your illustrations, and that you have not already described in your manuscript. Writing the descriptive text therefore requires your expertise.

How to write alternative/descriptive text?

Be concise

Avoid repeating information already contained in the context of the image — whether it is the title or note of the figure or the surrounding text. Ask yourself: what is **the information that this image conveys and that is not present in the text?**

In the same way, irrelevant information will be ignored; for example, we will refrain from mentioning any colors if they only serves to facilitate the reading of the image, so if they do not provide information.

Contextualize!

The same image can be described in different ways depending on the context.

It is necessary to review the surrounding text to understand the function of the image.
This contextualisation not only makes it possible to understand the function of the image, but also to identify the information transmitted by the image that is already addressed in the text.

To summarize

- Concise descriptions are preferred.
- Avoid repeating information that appears in adjacent text. If descriptions exist, for example in the captions, direct the user to these contents.
- Evoke colors only when they are meaningful (arbitrary colors in a bar chart, for example, are not worth describing).
- Favour a precise vocabulary.
- Avoid introducing new concepts or vocabulary elements.
- Ensure that the style and vocabulary used are in line with the surrounding text.
- Describe only what is visible: the formal elements of the image and the actions represented.
- Avoid interpretation.
- Write the abbreviations and symbols in full so that screen readers can read them correctly.

How do you know if your alternative text is relevant?

There are as many possibilities for alternative texts as there are people writing them. In doing so, there is not a single relevant alternative text, but potentially several.

To judge the relevance of an alternative text, you must put yourself in the shoes of the hindered reader. Hide the image and check that the description allows you to mentally visualize the image (or ask someone to engage in this exercise). This allows you to adjust the description (clarifications, details, etc.) if necessary.

Image typology

Images can be:

- Patterns
- Graphs (histogram, scatter plot, etc.)
- Organizational charts
- Maps
- Logos
- Pictograms
- Screenshots
- Photographs
- Drawings (humorous, painting, etc.)

The examples of illustrations below are intended to be a typology of the various figures that are frequently found in our published books. We are well aware that it is incomplete. Also, do not hesitate to contact the editor in charge of your project to find together the best way to describe problematic illustrations.

Examples

1) Schematics

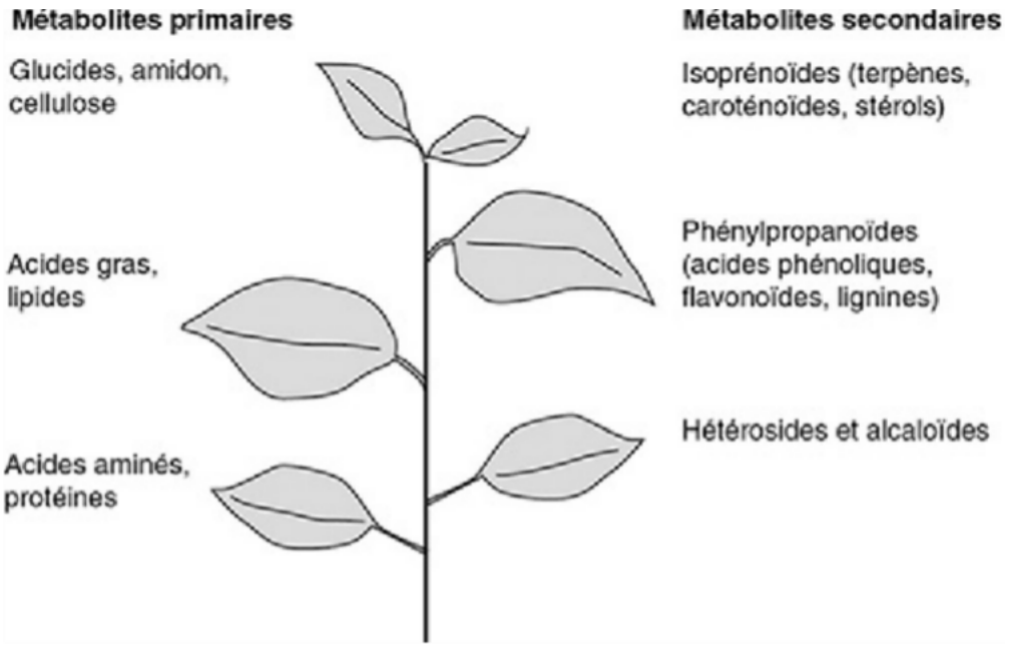

Figure 1. Main molecules produced by plants.

Alternative text

Diagram distinguishing secondary metabolites from primary metabolites.

[The distinction between primary and secondary metabolites appears only in the figure, not in the title; it should therefore be mentioned. The image lists and sorts the metabolites, which neither the title nor the context does (the text simply lists them "out of order", without distinguishing them); a descriptive text is therefore necessary insofar as the current alternative text+all metabolites > 145 characters — in addition to the interest of listing them in the form of enumerations. Finally, no interest in describing the plant drawn, and no interest either in specifying that the primary metabolites appear on the left of the diagram and the secondary ones on the right.]

Descriptive text

Primary metabolites:

- Carbohydrates, starch, cellulose
- Fatty acids, lipids
- Amino acids, proteins

Secondary metabolites:

- Isoprenoids (terpenes, carotenoids, sterols)
- Phenylpropanoids (phenolic acids, flavonoids, lignins)
- Heterosides and alkaloids

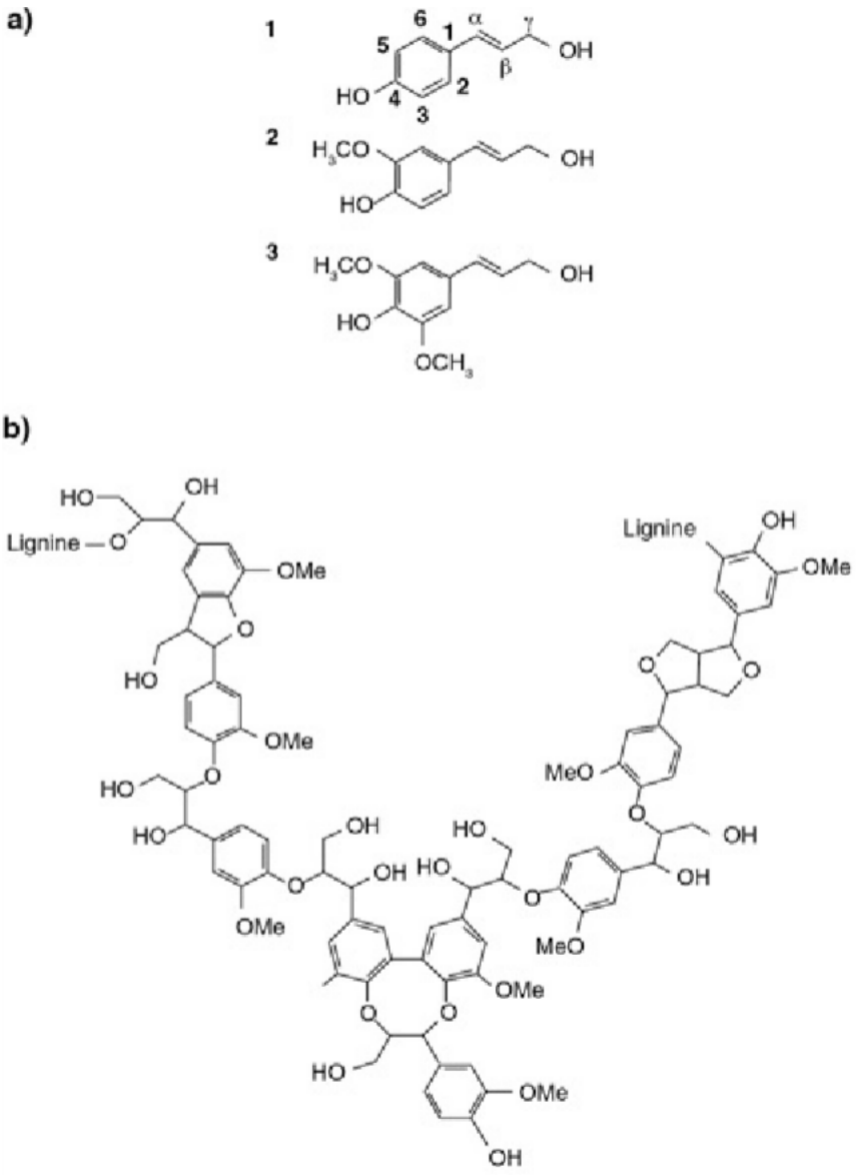

Figure 3. a. Structure of three monolignols (paracoumaryl, coniferyl and sinapylic alcohols). b. General formula of lignins.

Alternative text

Schematic representation of chemical structures.

[It would be tedious, if not impossible, to accurately describe these molecular structures; the author placed this figure to give a general idea of these molecules. No descriptive text is necessary here.]

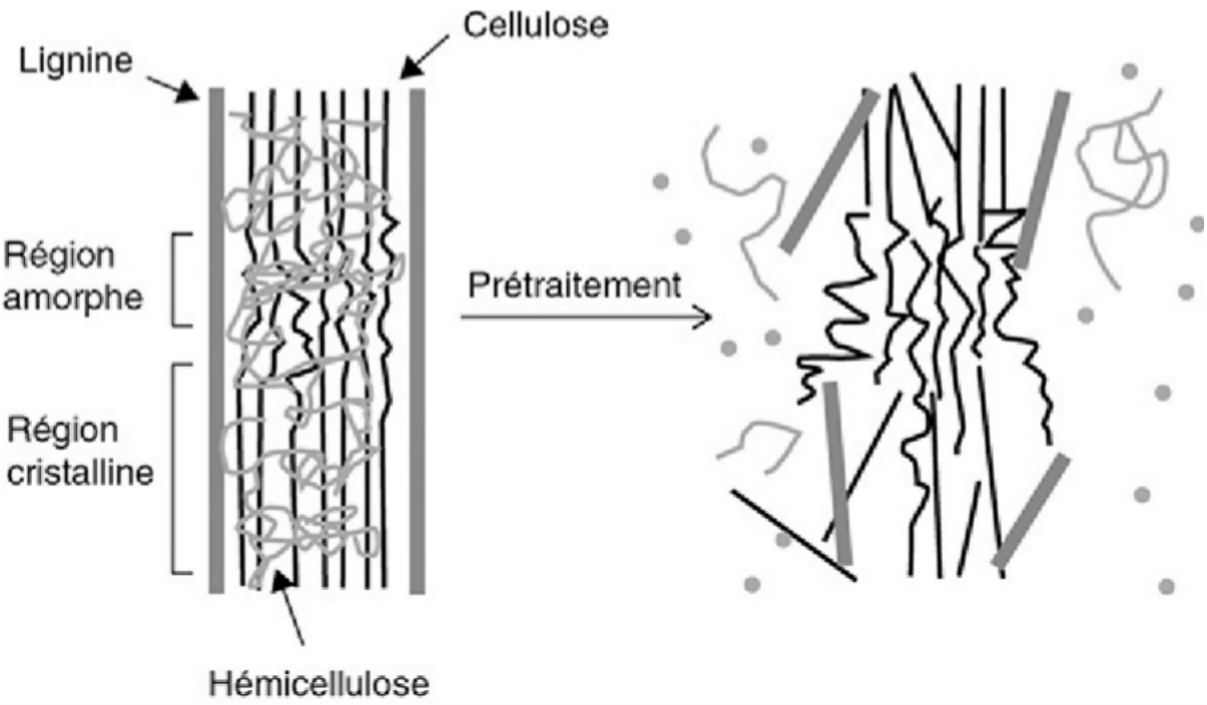

Figure 17. Treatment of lignocellulosic fibres.

Alternative text

Schematic representation *[implied "of the treatment of lignocellulosic fibres"]*

[Needless to say, lignin is represented by thick gray lines, cellulose is roughly parallel to lignin, etc.]

Descriptive text

This diagram shows that a pretreatment of the lignocellulosic fibres allows, after disintegration of the lignin in the amorphous and crystalline regions, the release of cellulose and hemicellulose.

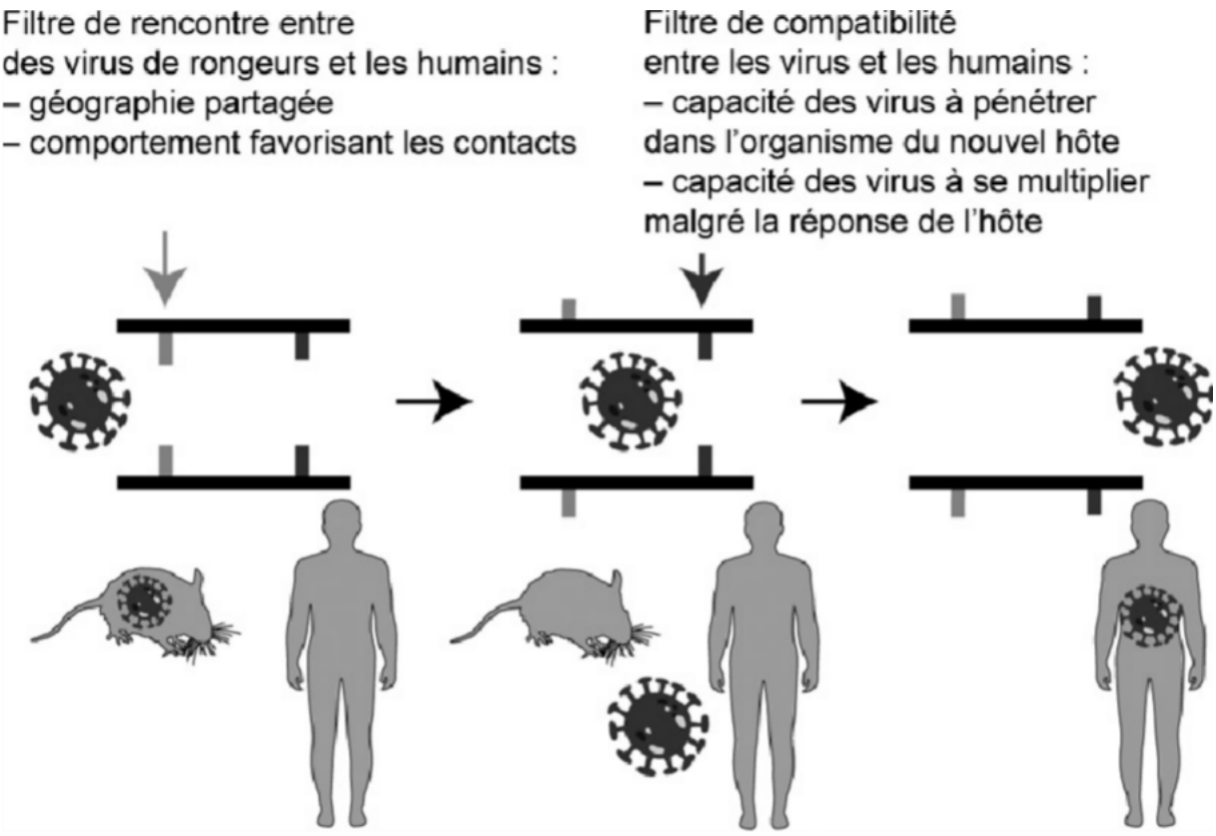

Figure 2. Encounter and compatibility filters. We have considered here an example of viruses passing from rodents to humans.

Alternative text

Schematic representation of filters, associated with the presence of the virus in humans and rodents.

Descriptive text

The virus first comes up against the meeting filter between viruses and humans. This can be lifted by shared geography or contact-promoting behavior. Once this filter is overcome, the virus encounters a second one: the compatibility filter between viruses and humans at the molecular level. Its circumvention depends on the ability of viruses to enter the new host's body and multiply despite the host's response. The virus can then infect humans.

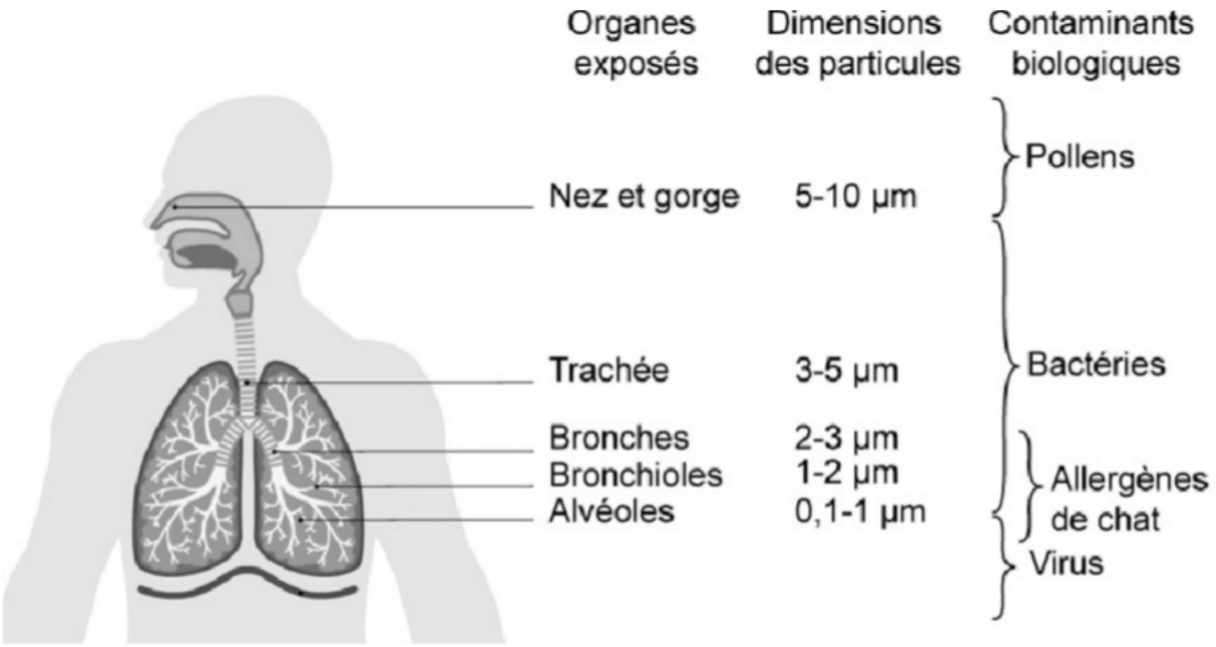

Figure 6. Level of penetration of biological contaminants into the respiratory system according to their size.

Alternative text

Diagram of the human respiratory system with, facing the different parts, the biological contaminants that may be present and their dimensions.

[It's not just graphs, histograms and other scatter plots that can be described by means of a table.]

Descriptive text

Exposed organs	Particle size (in urn)	Organic contaminants
Nose and Throat	5 - 10 micrometers	Pollens
Trachea	3-5 micrometers	Bacteria
Bronchi	2-3 micrometers	Bacteria, cat allergens
Bronchioles	1–2 micrometers	Bacteria, cat allergens
Alveoli	0.1 - 1 micrometers	Bacteria, cat allergens, virus

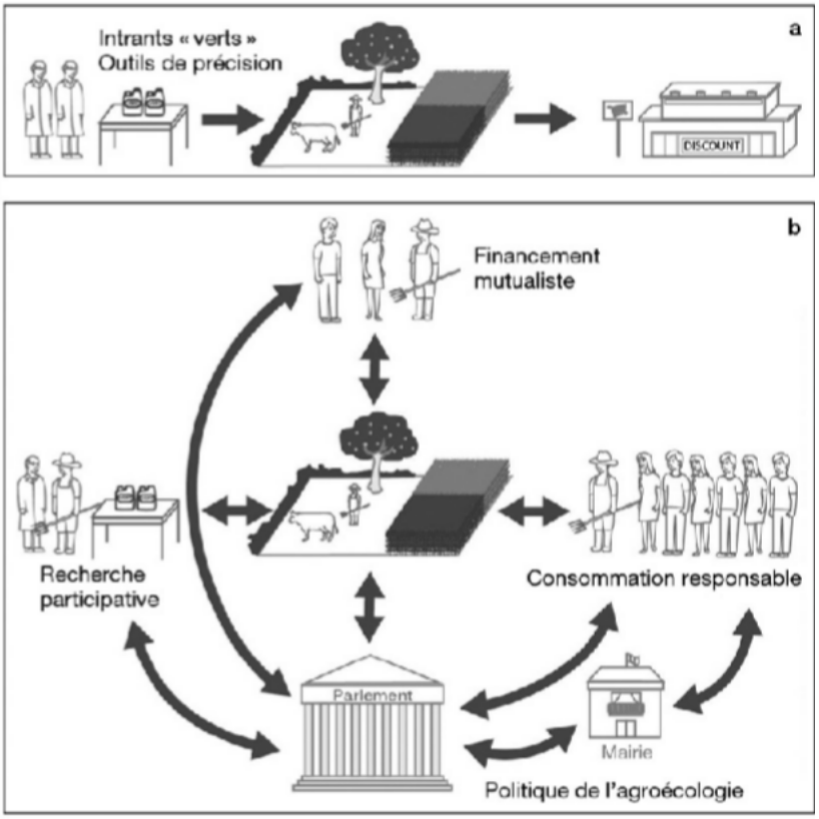

Figure 1. "Weak agroecology" (a) and "strong agroecology" (b) (© Le Basic – Matthieu Calame, 2016. *Understanding agroecology*. Reproduced with permission from BASIC – Beginner's All-purpose Symbolic Instruction Code, (lebasic.com).

Alternative text

Two diagrams representing the two models.

[The description of how the two types of agroecology are represented here is unnecessary; it is the general principle of both that deserves to be described.]

Descriptive text

The "low agroecology" model is unidirectional: from research to farmers, extended by a low valuation of low-cost food in large retailers.

In the "strong agroecology" model, the farmer and his farm are at the center of a system and interrelated with:

- Cooperative finance
- Participatory research
- Public policies (parliament and town halls)
- Responsible consumption

These five elements themselves interact with each other.

2) Graphs

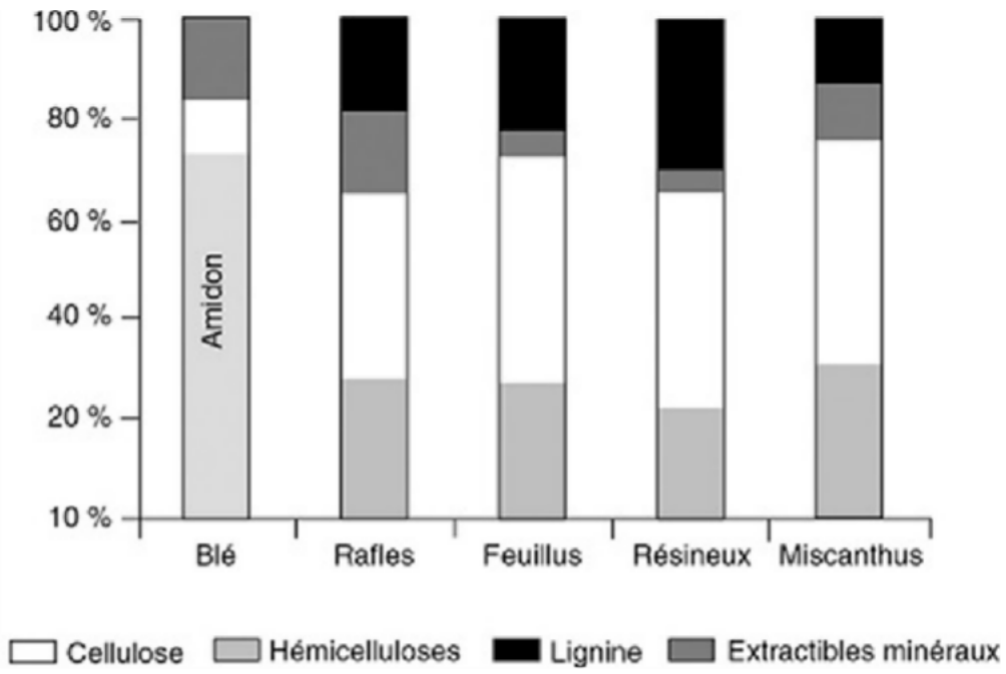

Figure 4. Distribution of major lignocellulosic compounds in plants.

Alternative text

Histogram

[Obviously, a descriptive text is necessary here since we will obviously exceed 145 characters. The idea is not to give the exact composition of major compounds of each plant (especially since this composition is not present in the image), but to indicate the differences in proportions.]

Descriptive text

Wheat contains more than 70% starch, cellulose and extractable minerals, but no lignin or hemicellulose. Rashes, lobed-leaved trees, resiniferous trees and miscanthus contain almost similar proportions of hemicellulose and celluloses, about 20%. The relative amount of lignin in resiniferous trees, more than 30%, is greater, while scoops and miscanthus contain a greater amount of extractable minerals (around 10-15% against less than 5% for softwoods).

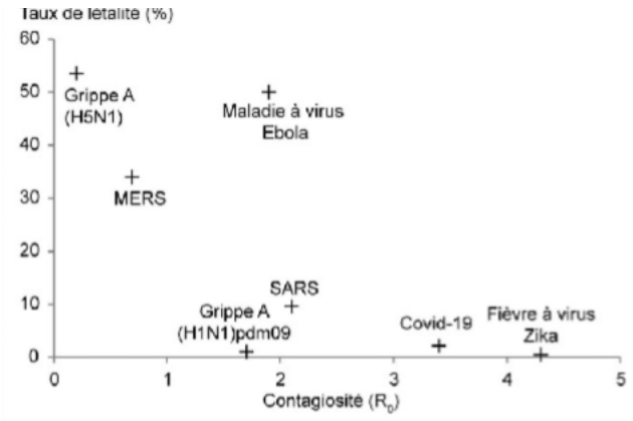

Figure 4. Basic reproduction rate (R_0) and case fatality rate (number of deaths/number of patients) in humans for some zoonoses.

MERS-CoV: Middle East *Respiratory Syndrome* Coronavirus. SARS: *Severe acute respiratory syndrome* (from 2002-2003). These numbers, from the literature, are an indication and vary according to the context. From various sources (doi: 10.3934/mbe.2019174; doi: 10.1016/S1473-3099(16)00153-5; doi:10.1016/S1473-3099(20)30484-9; doi:10.1097/EDE.0b013e3182a67448; doi:10.1056/NEJMsr1513109; https://www.who.int/news-room/fact-sheets/detail/ebola-virus-disease ; https://reacting.inserm.fr/wp-content/uploads/2020/10/COREB_REACTing_13102020-compresses%CC%81.pdf ; https://www.who.int/news-room/commentaries/detail/estimating-mortality-from-covid-19 ; doi:10.1016/j.envres.2020.109114; doi:10.1016/j.ijid.2019.08.033).

Alternative text

Graph with the contagiousness (R_0) on the x-axis and the case fatality rate in percent on the y-axis.

[This case is typical of situations for which a table will allow a precise description of the figure.]

Descriptive text

Zoonotic diseases	Basic reproduction rate (R_0)	Case-fatality rate CFR (%)
Influenza A (H5N1)	1	60
Ebola virus disease	1.9	50
MERS	0.5	35.6
SARS	2.8	9.6
Influenza A (H1N1) pdm09	1.5	0.2
Covid-19	3.3	<1.5
Zika virus fever	4.2	3

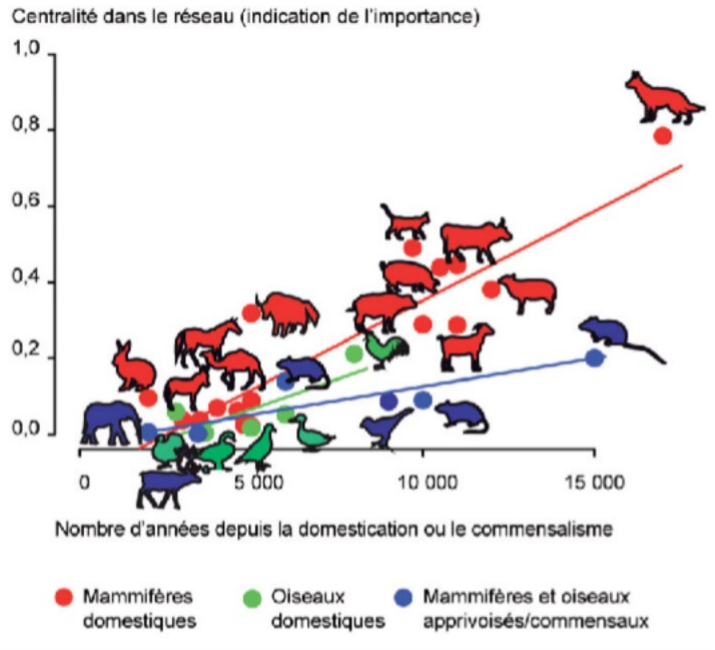

Figure 5. Duration of domestication and zoonoses.

Relationship between the number of years since domestication or commensalism and the centrality (indicator of importance) of zoonotic agents by host species in the sharing network with all other host species and humans. Domestic mammals: dog (*Canis familiaris*), cat (*Felis catus*), yak (*Bos grunniens*), zebu (*Bos indicus*), cow (*Bos taurus*), buffalo (*Bubalus bubalis*), pig (*Sus scrofa*), sheep (*Ovis aries*), goat (*Capra hircus*), horse (*Equus caballus*), donkey (*Equus asinus*), dromedary (*Camelus dromedarius*), camel (*Camelus bactrianus*), rabbit (*Oryctolagus cuniculus*); domestic birds: domestic duck (*Anas platyrhynchos*), domestic goose (*Anser anser*), hen (*Gallus gallus*), domestic pigeon (*Columba livia*). Tamed/Commensal: Reindeer (*Rangifer tarandus*), Asian elephant (*Elephas maximus*), Common rat (*Rattus norvegicus*), Black rat (*Rattus rattus*), House mouse (*Mus musculus*), House sparrow (*Passer domesticus*) (© S. Morand).

Alternative text

Graph with on the x-axis the number of years since domestication or commensalism, and on the y-axis the centrality in the network (indication of the importance). Species are classified into three categories: domestic mammals, domestic birds, and tame/commensal mammals and birds.

[Unlike the previous graph, there is no need to specify the data associated with each species or group of species; it is the relationship of the groups with humans that matters.]

Descriptive text

The older a species has relationships with humans, the more pathogens it hosts are shared with all host species and humans. This relationship is stronger for domestic mammals, somewhat less for domestic birds and less strong for tame/commensal mammals and birds.

3) Organizational charts

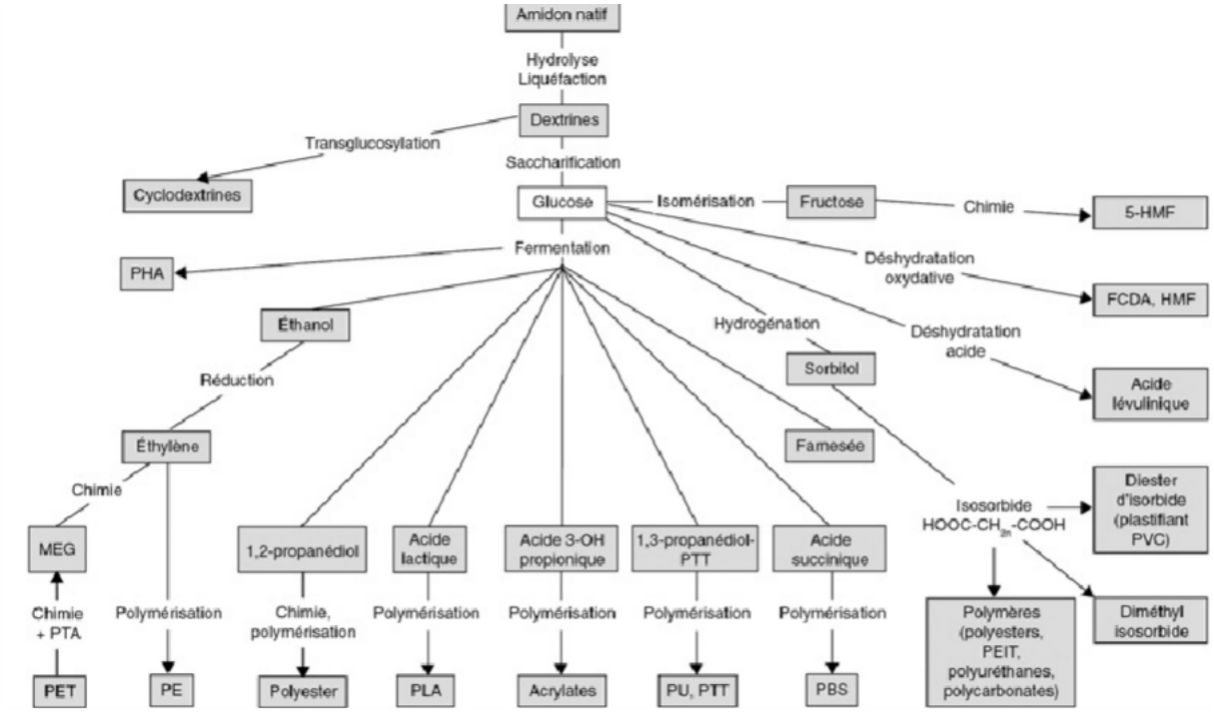

Figure 8. Diagram of industrial biochemistry pathways for the synthesis of starch-derived compounds.

FCDA (furan dicarboxylic acid); HMF (hydroxy-methylfurfural); MEG (monoethylene glycol); PBS (polybuthylene succinate); PE (polyethylene); PEIT (polyethylene isosorbide terephthalate); pet (polyethylene terephthalate); PHA (polyhydroxyalkanoate); PLA (polylactic acids); PTT (polytrimethylene terephthalate); PU (polyurethane), PVC (polyvinyl chloride) (Tayeb *et al*., 2015a).

Alternative text

Organizational chart starting from starch.

[Organizational charts often lend themselves well to description in the form of a multi-level list. Since the note specifies the meaning of the various acronyms and acronyms, there is no need to return to them. In addition to describing this figure exhaustively (all labels+reactions or processes go from one to the other), efforts must be made to avoid repetition (" ... gives...) while remaining precise.]

Descriptive text

By hydrolysis or liquefaction, the starch is transformed into dextrins which, by transglucolysation, produce cyclodextrins. The saccharification of dextrins gives glucose which can be transformed into other molecules, depending on the treatment it undergoes:

- By isomerization, fructose is obtained which is transformed into 5- HMF by a chemical process;
- By oxidative dehydration, it becomes FCDA and HMF;
- Its dehydration in an acid medium produces levulinic acid;

- its hydrogenation leads to the synthesis of sorbitol, which can itself be converted into theisosorbide HOOC-CH2n-COOH. The latter is a source of:
    - isosorbide diester (a PVC plasticizer)
    - dimethyl isisorbide
    - various other polymers such as polyester, PEIT of polyurethanes and polycarbonates.

The fermentation of glucose is a source of PHA as well as ethanol, the reduction of which produces ethylene that gives polyethylene after polymerization. Ethylene can also lead, by a chemical process, to the production of MEG. MEG can also be obtained by chemical reaction of pet in the presence of PTA.

Fermentation of glucose can give:

- 1,2-propanediol, the chemistry or polymerization of which yields polyester;
- lactic acid, itself allowing the production of PLA by polymerization;
- 3-OH propionic acid, the polymerization of which gives acrylates;
- 1,3-propanediol-PTT which, still by polymerization, gives PU and PTT;
- polymerizable succinic acid, making it possible to obtain PBS by polymerization; and

farnesee.

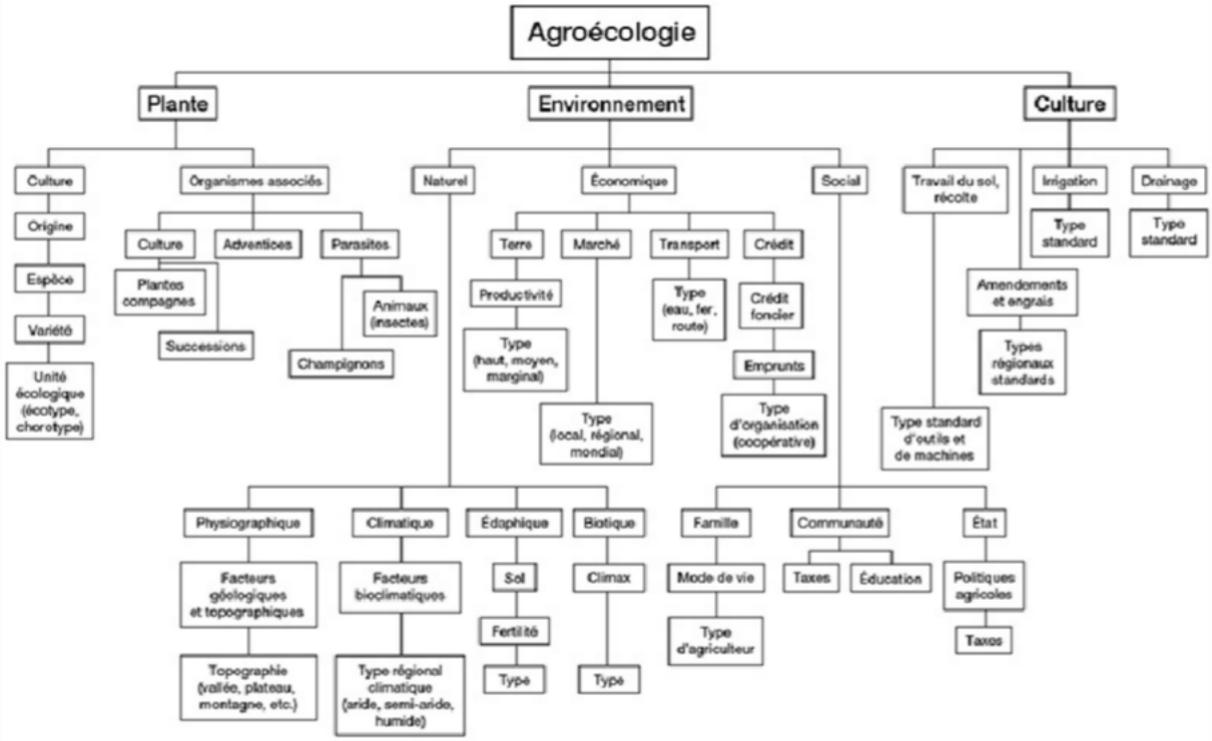

Figure 2. The Three Pillars of Agroecology, according to Bensin (1938).

Around the plant, the notion of chorotype appears alongside ecotype (bottom left) and a community of species; the environment also integrates economic and social components (center); cultivation techniques remain centered on the development of regional standards (right).

Alternative text

Organizational chart presenting the constituent elements of the notions of plant, environment and culture that agroecology encompasses.

[As with the organizational chart in Figure 8 above, multi-level lists make it possible to account for this type of figure. This will be more complex than the previous one, but reading devices technically manage structured lists very well as long as they are correctly formatted — using Word tools and not in an "artificial" way.]

Descriptive text

1. Agroecology
    a. Plant
        - Culture
            i) Origin
            ii) Species
            iii) Variety
            iv) Ecological unit (ecotype, chorotype)
        - associated organisms
            i) Culture
                a. Companion plants
                b. Estate planning
            ii) Plant Weed
            iii) Pests:
                a. Fungi

b. ANIMALS INSECTS

b. Environment
- Natural
  - i) Physiographic
    - a. Geological and topographical factors
    - b. Topography (valley, plateau, mountain, etc.)
  - ii) Climate.
    - a. Bioclimatic factors
    - b. Regional climate type (arid, semi-arid, wet)
  - iii) Edaphic
    - a. Floor
    - b. Fertility
    - c. Type
  - iv) Biotic
    - a. Climax
    - b. Type
- Economical***
  - i) Land
    - a. Productivity
    - b. Type (high, medium, marginal)
  - ii) Market
    - a. Type (local, regional, global)
  - iii) Transportation
    - a. Type (water, rail, road)
  - iv) Credit
    - a. Mortgage credit institution
    - b. Loans
    - c. Type of organization (cooperative)
- Social
  - i) Family
    - a. Lifestyle
    - b. Farmer Type
  - ii) Community
    - a. Taxes
    - b. Education
  - iii) State
    - a. Agricultural Politics
    - b. Taxes

c. Culture
- Tillage, harvesting
  - i) Standard type of tools and machines
- Amendments and fertilizers
  - i) Standard regional types
- Irrigation
  - i) Standard model
- Drainage
- Standard model
-

4) Maps

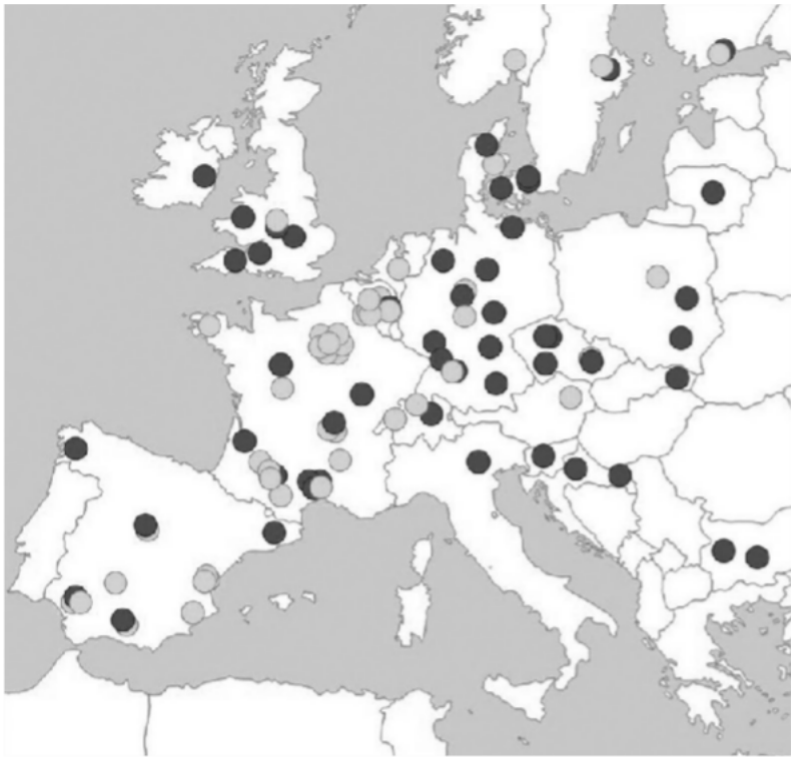

Figure 9. Mapping of stakeholders in agroecology research and training in Europe (source : Nicot *et al.,* 2018).

Present actor of the research (in dark grey) Actor of the training (in light grey)
Each point represents an actor. Two superimposed dots symbolize either two actors located in the same city, or the same actor present both in the research sector (in dark grey) and in the training sector (in light grey) (case of University Lecturer -researchers), as in Liège and Louvain (BE), Helsinki (FI), Lyon, Paris and Toulouse (FR), Göttingen and Stuttgart (DE), Seville (ES), Uppsala (SE) and Coventry (GB). Note that Aarhus University (DK) has two research sites in agroecology in addition to a training course (in Aarhus). This map also shows historical players no longer working in agroecology, such as in Maynooth (IR) and Devon (GB).

Alternative text

Actor mapping, described in the caption.

5) Logos

Alternative text
La Via Campesina logo

Bibliography

Summary document: Accessibility of images in the EPUBs, National Publishing Union, Digital Commission, Standards and Norms Group, October 2022.

How to describe the images? French adaptation by the BrailleNet Association of the guide “Image Descriptive Guidelines” from DIAGRAM Center, 2015, http://diagramcenter.org/table-of-contents-2.html

https://www.accessiblepublishing.ca/pratiques-recommandees-epub/

Inclusive Publishing in Practice (IPI) platform: https://www.inclusivepublishinginpractice.org/#/desktop/workspaces/open/doc/resources/hom e