

Supplementary material

Magalhães et al. 2018. L'économie matérielle de la France (1830-2015). L'histoire d'un parasite? Document de travail. HAL.

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2 Sources

Please find below all the sources that were used in order to complete the data set.

- Institut national de la statistique et des études économiques (1901-1952). *Annuaire statistique*. Paris: Imprimerie nationale
- Institut national de la statistique et des études économiques (1988). *Annuaire rétrospectif de la France. Séries longues. 1948-1988*. ark:/12148/bpt6k6243943k. Paris: Imprimerie nationale
- Institut national de la statistique et des études économiques (1953-2007). *Annuaire statistique de la France*. Paris: Imprimerie nationale
- Jutta Bolt et al. (2018). “Rebasing ‘Maddison’: New Income Comparisons and the Shape of Long-Run Economic Development”. In: *Maddison Project Database, version 2018, Working Paper 10*
- Ministère de l’agriculture et de l’alimentation (2018). *Agrete - La statistique, l’évaluation et la prospective agricole*
- Tihomir J. Markovitch (1965). *L’industrie française de 1789 à 1964 : sources et méthodes*. français. Cahiers de l’I.S.E.A. 163. Paris, France: Institut de science économique appliquée
- Ministère de l’agriculture et du commerce, France (1837-1873). *Résultats généraux de l’enquête décennale*. Used for the following inquiries: 1840, 1852, 1862. Paris: Imprimerie nationale
- Ministère de l’agriculture, Direction de l’Agriculture, France (1897). *Statistique agricole de la France. Résultats généraux de l’enquête décennale de 1892*. Paris: Imprimerie nationale

- Ministère de l’agriculture, Direction de l’Agriculture, France (1936). *Statistique agricole de la France. Résultats généraux de l’enquête décennale de 1929*. Paris: Imprimerie nationale
- Ministère de l’agriculture, Direction de l’Agriculture, France (1886-1960). *Statistique agricole annuelle (1885-1959)*. Paris: Imprimerie nationale
- Ministère des finances, Direction générale des douanes, France (1924-1964). *Statistiques mensuelles du commerce extérieur de la France*. Paris: Direction générale des douanes
- Ministère de la Transition Ecologique (1990-2015). *MFA dataset for France*
- Ministère de la marine, France (1866-1987). *Statistique des pêches maritimes*. Paris: Imprimerie administrative de Paul Dupont
- Jean-Claude Toutain (1971). “La Consommation alimentaire en France de 1789 à 1964”. In: *Economies et Sociétés, Cahiers de l’ISEA* 5(11), pp. 1909–2049

3 Technical report

3.1 Statistical territory

The geographical territory used for statistics does not always clearly appear in the statistical yearbook. The total for France or for the French Empire (“Total France” or “Empire”) are often the only available information, as if the territory at stake was well defined.

If statistics exist for colonies or for Algeria, the INSEE (National Institute of Statistics and Economic Studies) has always distinguished between these and the ones from the French Metropolitan Territory. Nevertheless, a choice remains necessary since this territory has changed over time. We chose to draw on the territory that was used for the surveys, i.e., this territory did not remain the same. Below are shown all the modifications that occurred during our time-frame. The authors from the work on the UK have undergone the same choice¹. They kept the same statistical territory, which explains the huge drop in their statistics at the time Ireland becomes independent. We don’t observe such an impact in our work. Nevertheless, we can mention an addition of about 10% in the total coal extraction in 1919.²

If the statistical territory evolves, the changes almost always correspond to the changes of the metropolitan territory (Annuaire 1919-1920, shelf number: 4-LF262-3):

- addition of the *Départements* of the Alpes-Maritimes, Savoie, and Haute-Savoie in 1860;
- loss of the *Départements* of Moselle, Haut-Rhin, Bas-Rhin (except the Territoire de Belfort which remains in the statistics) in 1871;
- re-addition of the *Départements* of Moselle, Haut-Rhin, Bas-Rhin in 1919. For example, there are 86 departments in the statistical survey of 1852, 89 in 1862, 87 in 1892 (including Belfort), and 90 in 1929 (including Belfort);

1. Schandl and Schulz 2002.

2. « L’extraction totale des combustibles minéraux (houille, anthracite et lignite), durant l’année 1919, a été de 22 400 000 tonnes, dont 19 900 000 tonnes pour la France d’avant-guerre et 2 500 000 tonnes pour la Lorraine (département de la Moselle). » (Annuaire 1919-1920, p.3)

- Territory of the Saar Basin (Saargebiet in German and Territoire du Bassin de la Sarre in French): it appears as separated from France and Germany through 1924. This territory is attached to the French statistical territory in 1925, and removed on 17 February 1935; it is attached again on 1 April 1948, and removed on 6 July 1959.

Exceptions are the following:

Customs Since 1 January 1997, the overseas departments (DOM) have been integrated into the statistical territory of France. This includes mainland France, Corsica, Monaco, the other French coastal islands, and the DOM (Melzi 2012, p. 232)

Fisheries some are carried out in Iceland, Feroe Islands and Dogger-Bank, Newfoundland (*Terre-Neuve*), and (rarely) West Coast of Africa. This is necessarily outside national territory but has been taken into account (derisory figures anyway).

3.2 Physical Trade Balance (PTB)

3.2.1 Errors from the administration.

We have no precise idea of how wrong are customs statistics in the 1800s. Apart from that, they estimate a loose in traceability since 1993 of about 5 to 10% concerning trade within the European Union (all operators with commodity flows inferior to 460,000 euros per year do not declare anything at all³).

3.2.2 Extrapolation

The dataset we have for years 1830-1880 comes from *Tableaux statistiques décennaux* consisting of production average for the following periods: 1827-1836; 1837-1846; 1847-1856; 1857-1866; 1867-1876; 1877-1886; 1887-1896.

In order to obtain a yearly dot, we followed two things:

- an assumption: production increases through the 19th century;
- we attributed this average to the median year of the intervals, respectively 1832, 1842, 1852, 1872, 1882, and 1892, then thanks to a simple linear interpolation (example: $B.1.1_{1833} = (-B.1.1_{1842}^* - B.1.1_{1832}^*)/(1842 - 1832) \times 1833 + (B.1.1_{1842}^* - (-B.1.1_{1842}^* - B.1.1_{1832}^*))/(1842 - 1832) \times 1842$), où X^* designate the attributed values, we got an estimated for annual production for each category.

We have yearly data for years 1888-1942, which allow us to verify whether the above interpolation was right on years 1888-1892. Regarding the four main categories (B.1, B.2, B.3, B.4), the main difference is a 15%-underestimation of metal imports (B.2) in 1888. Regarding secondary categories, changes in nomenclatures do not allow any relevant and coherent comparison. In the end, the interpolation method is quite satisfactory. To smooth nomenclatures' transitions, annual data for 1888 (imports) and 1889 (exports) have been chosen as final boundary markers for the linear interpolation.

3.2.3 Conversions

ITEM	COEFFICIENT
Ox	0.4

3. Personal declaration.

ITEM	COEFFICIENT
Cow	0.4
Calf	0.06
Ovine includ. lamb	0.02
Hog	0.2
Suckling pig	0.01
Stere	0.5
Wine, alcohols	$1hL = 0.1T$

Table 1: Conversions in tons for animals, wood, and alcohol

ITEM	COEFFICIENT
Horse, Donkey, Mule	0.7
Dog	0.02
Millstone	1
Grindstone tile	0.25

Table 2: Conversions in tons used only for 1900 and 1910

3.3 Domestic extraction (DE)

3.3.1 Primary sources

The MFA analysis requires the use of the extraction of raw material. In order to achieve national statistics related to the Metropolitan territory, we used statistical yearbooks from the French National Institute of Statistics and Economic Studies (INSEE) for most data. For years 1948-1988, most data come from a retrospective statistical report published in 1990 (Institut national de la statistique et des études économiques 1988). However, for some categories—such as fish, oil, coal—data were extracted from normal yearbooks. For years 1990-2015, we completed the yearbooks’ statistics with data from the Ministry of Ecology and Energy transition which has given us a MFA-yearly data set. This is especially the case after 2005 which is the last year of publication of the INSEE yearbooks.

Data from the retrospective report sometimes really differ from the yearbooks’ data. As a common rule for all data related to domestic extraction, we favor those from the retrospective report. For instance, quantities of feldspath in the 1966 yearbook and in the retrospective report are the same. However, in 1970, the value from the retrospective report is double. We would like to bring here a kind reminder for the reader: there are issues of convention, bargaining, estimations, reports, construction, transcription, nomenclature inherently brought with the production and publication of data by the INSEE. For a more robust analysis, we must confront data from other sources so that we could corroborate the numbers used.

Categories of raw material that appear in the domestic extraction for achieving a MFA analysis are detailed and ordered following four categories in the methodological guide Krausmann et al. (2015). In general, our work was simply to copy data from the yearbooks to the corresponding MFA section. For a detailed list, please see section "Association table" (table 7).

The data set from the Ministry of Ecology shows some classification's differences which are as follow (first: Krausmann's guideline ; second: Ministry of Energy transition):

- A.1.2.1 = A.1.2.1.1
- A.1.2.2 = A.1.2.1.2
- A.1.3 = A.1.2.2
- A.1.4 = A.1.3
- A.1.5 = A.1.4
- A.1.6 = A.1.4.3
- A.3.2 = A.3.2 + A.3.6
- A.3.4 = A.3.8
- A.3.6 = A.3.4
- A.3.7 = A.3.5
- A.3.8 = A.3.9
- A.3.9 = A.3.10
- A.4.1 = A.4.1.1
- A.4.2 = A.4.1.2
- A.4.3 = A.4.2.1
- A.4.4 = A.4.2.2
- A.4.5 = A.4.1.4
- A.4.6 = A.4.1.3

If a change in a parent node keeps children nodes in the same order, only the parent node is written above.

3.3.2 Errors in yearbooks

Some sections were harder to fill in. First of all, obvious units' mistakes have been noticed for rice harvest (data in million of quintals instead of thousands of tons), rapeseed and sunflower harvest (data in million of quintals instead of thousands of quintals). Errors have been noticed while comparing the yearbooks and the retrospective reports for some years (for instance: 1953, 1960, 1963, and 1970).

3.3.3 Conversions

Natural gas If data were mostly presented in metric tons, some conversions remained necessary. For instance, natural gas was sometimes indicated in billion of therms (thm), an old energy unit which was as follow: $1thm = 1000kcal$. We used a weight-energy conversion factor from Krausmann *et al.* (2015, p. 68), which is the following:

$$n_{\text{natural gas}}[T] = \frac{E_{\text{natural gas}}[10^9thm] \times 10^6}{2.39 \times 5}$$

Natural gas was also given in terms of ton of oil equivalent (toe). In order to convert this unit, we used a footnote from the 1994 yearbook indicating $1000m^3 = 0.9toe$ and the factor given in the MFA methodology (Krausmann *et al.*, 2015, p. 68), which lead to the following formula:

$$n_{\text{natural gas}}[T] = V_{\text{gas}}[m^3] \times \frac{0.8}{1000} = E_{\text{gas}}[toe] \times \frac{0.8}{0.9}$$

Timber Regarding timber, we had to convert cubic meters in tons for both broad-leaved trees and conifers (see Table 1). Two isolated cases are noteworthy:

- Sleepers made of wood (*bois sous rail* is the French designation) for which we used the size given by the British railway association (rta.org) so that we could convert cubic meters of sleepers in tons. The size was: 235 lbs of weight for a volume of 7" × 9" × 8'5".
- Regarding tropical timber, in the absence of any reliable conversion, we used the coefficient given in the MFA methodology for the UE25.

TYPE OF TREE	DENSITY ($t/DM/scm$)	DENSITY (t AT 15% m/scm)
Conifers	0.44	0.52
Broad-leaves	0.58	0.68
Mean UE25 (80% of conifers)	0.47	0.55

Table 3: Coefficients for timber conversion

Density is converted to ton using the 15% moisture coefficients for hardwoods (0.68) and conifers (0.52). If the species are mixed or the woods of unknown types, the EU25 average coefficient (80% coniferous) applied is 0.55.

Other conversions Some other coefficients are gathered in table 4.

MATERIAL	CONVERSION
Marble	2.563 ton per cubic meter (Kraussmann <i>et al.</i> , 2015, p. 54)
Granit	2.691 ton per cubic meter (Kraussmann <i>et al.</i> , 2015, p. 54)
Curb or kerb (GB)	Given in meters. We chose a reasonable standard volume of 1m x 0.2m x 0.2 m
Gypsum plasterboard	Given in square meters. A current density would be 9.52 kilograms per square meter (Website from a French construction brand: https://www.pointp.fr/platre-isolation-ite/plaque-de-platre-standard-placoplatre-ba13-2-8x1-2-m-ep-13-
Sardines	Average weight per fish: 45g (tab.ac-poitiers.fr/lycee-hotelier-la-rochelle/IMG/pdf/Grammage_4.pdf)
Scallops	Average weight per scallop: 320g https://www.academiedugout.fr/ingredients/coquille-saint-jacques_872
Mussel and other similar seashells	Average density: 750g/L https://chezmonpoissonnier.fr/quel-poids-dun-litre-moules/

Table 4: Coefficients for other conversions

3.3.4 Estimations

Harvest Some other values had to be estimated (Kraussmann *et al.*, 2015, p. 28). For instance, this may be the case of plant residues used (notably straw when it is not given by statistics). In order to get the weight of plant residues, the simple following calculus is necessary:

$$m_{\text{residue}} = m_{\text{harvest}} \times t_{\text{residue}}$$

Table 5 shows the values given in the methodology (Kraussmann *et al.*, 2015, p. 28) combining both the harvest factors and the recovery rates.

PLANT	t_{residue}
Wheat	0.7
Rice	0.84
Corn	0.84
Other cereals	0.7
Roots and tubers	0
Sugar beet	0
Pulses	0.7
Dry beans	0
Rapeseed	1.33
Sunflower	0.95
Other oil-bearing crops	1.33

Table 5: Ratio of plant residues including the harvest factors and the recovery rates

Please note that these coefficients do not depend on time, which makes them ahistorical with regards to plant selection and evolution. The case of wheat is a great defense for criticizing this type of coefficient. Quantities of straw - and quality of course - was doubtlessly different in 1988 and in 1848.

The harvest factor is used to get the weight of straw or residue produced from crops if not given in national statistics. For Western Europe, the MFA methodology gives a number of 1.0 for cereals. Given the evolution of crops and cultivars along the 19th and 20th centuries, we claim that this factor should be historicized. Since French national statistics show quantities of straw produced, it was been possible to construct the harvest factor from our data for some years. It is shown in Table 4. It enlightens the following considerations:

- the problems of having an ahistorical factor;
- a huge volatility even for year-to-year periods, which emphasizes a botanical issue beyond a simple historical issue;
- the harvest factor we found is much greater than the one given in the MFA methodology;
- there is also an induced variability, due to estimation methods (since most of the time these data are estimates from surveys and are not census data)—this would deserve further investigations; o what extent may we ensure that our data are accurate, i.e. can we believe their reliability? Indeed, we have not studied how they were constructed

and gathered from 1852. This particular point may enter a more general criticism for all data we use. This being said let us note here that the harvest factor remains quite stable from 1852 to 1920.

Moreover, MFA studies incorporate assumptions regarding data: the acknowledgement of national official statistics without any amendment for self-consumption and other non-profit/non-trading/non-market consumption, the adoption of a constant harvest factor over time, etc. These assumptions tend to underestimate past quantities, and thus they reinforce the "everything grows" narrative, which is one of the two sides of the conquering modernity.

YEAR	HARVEST FACTOR
1852	1.78
1862	1.66
1880	1.78
1885	1.71
1900	1.71
1906	1.69
1910	1.96
1920	1.74
1929	1.52
1930	2.00
1931	1.74
1939	1.40
1946	1.54
1955	1.29
1965	1.08
1970	0.74
1974	0.57
1978	0.53
1981	0.48
1985	0.42
1987	0.41
2000	0.33

Table 6: Calculated harvest factor for all cereals (wheat, oat, barley, rye) using collected data for straw and grain harvest in statistics

Metal ores Regarding metal ores, a particular care must be taken to use gross ore and not metal content. Our data indicate alternatively the mass of gross ore, the mass of commercial concentrate (sometimes the concentration of the concentrate is specified sometimes not), and the mass of metal content. Table 5 lists the various factors we used if not already specified in the sources. Values are from Krausmann *et al.* (2015, pp. 44-53) and Schaffartzik *et al.* (2016, p.8).⁴ We must again note the limit of this type of conversion without opening a discussion with, especially for the metal, the archives of the mines. For example, there is no

4. For the metal concentration of zinc ore, this is an average for all countries from Europe cited by Krausmann *et al.* (2015, pp. 47-49). For tin, lead and copper, since the value for France lacked, we have taken the one given for Spain (Krausmann *et al.*, 2015, p.47).

longer any copper ore mining in France since the 1961 Chizeuil (Saône-et-Loire) formation was depleted, with the exception of copper contained in gold ores unknown concentration levels: this makes the checks all the more complicated.

METAL	GROSS ORE	COMMERCIAL CONCENTRATE
Copper	1.58%	30%
Lead	5.9%	40%
Zinc	6.3%	55%
Tin	0.016%	
Gold	0.001%	
Bauxite	50%	
Tungsten	1.5%	
Uranium	0.17%	

Table 7: Concentration of metal ores

Wine graps Regarding wine grapes used for the manufacture of wine, it is necessary to convert the volumes of wine into quantity of grapes since they do not appear elsewhere in the national statistics. Robinson (2006, pp. 780-781) gives a coefficient of 140 kilograms per hectoliter for a mixture of red wine and white wine. We use this coefficient as a raw estimate for the 20th century, observing that it would be different among types of grape, and can vary greatly depending on the type of variety. For the 19th we assumed that 10hL of beverage would equal 1T.

Ready-mix concrete The first cement plants were developed in France between 1850 and 1860 by the *Société des Ciments Français*. Ready-mix concrete is recorded only from 1963 in the statistical yearbooks. At present, we do not have sufficient information to certify which materials are accounted for by the INSEE for ready-mix concrete. For instance, we do not know if sand is accounted for twice or none. Yet according to the great importance of ready-mix concrete takes in terms of tons, it is simply not possible to remove for the analysis. Though one should take particular attention to this case. Table 6 gives the weight coefficient we used to convert ready-mix concrete to cement and aggregate, i.e., removing the water weight.

Data in table 8 come from <http://www.infociments.fr/betons/composition/formulation/connaissance-beton-historique-fonction>.

COMPONENTS	WATER	AIR	CEMENT	AGGREGATE
Volume (in %)	14-22	1-6	7-14	60-78
Weight (in %)	5-9		9-18	65-85

Table 8: Percentages of ready-mix concrete

Moreover, a lot of materials were given as manufactured products made of concrete (and not cement). These materials are not accounted for in other categories since they go directly out from quarries which are also factories. In the absence of a better estimate, the same ratios as for ready-mix concrete have been applied to these products.

3.4 Missing data

Some data are clearly missing for a few years in both types of yearbooks, in particular for non-metallic minerals and metals. Hereinafter is shown a non-definitive list of missing data. Data from the 19th are not present in this list since many data were missing. Details about missing-data estimates are provided in the following sections.

- 1948-1950: lead ore, *plaques de couverture*, *plaques ondulées*, *plaques planes*
- 1948-1951: gypsum, shale oil ;
- 1948-1952: fish and other water creatures, tin ore, other stones, granite and marble – slices, concrete stands, run material, kaolin, refractory earths, sodium chloride in dissolution, sea salt, rock salt, asphalt rocks, spar, quartz and quartzite, talc, feldspar
- 1954-1961: uranium
- 1985-1988: *plaques de couverture*, *plaques ondulées*, *plaques planes*
- 1987-1988: wine
- 1988: lentils, copper ore, lead ore, gross marble tiles, granite, gross basic slag, gypsum, plaster for construction, special plasters for molding, curb, rocks, gravels, *matériaux concassés de roche et de laitier*, rubble stones, sands, industrial sands, concrete stands, run material, sanitation pipes

Uranium The French production of uranium began in 1954. Though there is no data in the yearbooks between 1954 and 1961 (except for 1960) for gross ore of uranium. Production is of 50T in 1954, 826T in 1958, 1180T in 1959 and 1000T in 1962. The following procedure was followed for getting gross ore:

- gross ore in 1961 = $\text{mean}(1960, 1962)$
- gross ore in 1954 = $0.05 \times \text{gross ore in 1962}$
- gross ore in 1958 = $0.826 \times \text{gross ore in 1962}$
- gross ore in 1959 = $1.180 \times \text{gross ore in 1962}$

Other years are smoothed using affine lines.

Straw We estimated straw for the missing years using the straw-to-grain ratio calculated thanks to the years when data are present (see Table 4), and then smoothed with affine lines. The coefficient is multiplied by the grain harvest of the year in question.

Pastures Regarding pastures (non-mowing meadows, moor, heather), 1852 is the only available year. The total forage excluding beet, cabbage and fodder turnips in 1852 is 26,000,000T. The total forage (excluding beet, cabbage and fodder turnips) was first roughly estimated between 1840 and 1939, assuming an increase towards the post-harvest level (about 50,000,000T in 1948). This assumption is supported with the development of animal draft and meat consumption until the 1930s. Moreover, the rural exodus made lands with small yields for cereals turn back to pasture and fodder from the end of the 19th century.

As soon as national statistics were significantly below our estimate, we added a box "Pastures (non-mowing meadows, heath, heather, pasture)" and included the difference between

our estimate and the total statistics in order to avoid neglecting fodders eaten by animals in woods and heather. This concerns the following years: 1840, 1850, 1852, 1874, 1880, 1885, 1890 and 1900.

Other estimations for biomass

Potatoes Toutain (1971, p. 1927) gives ten-year data for periods covering 1815-1830, 1850-1860, 1870, and 1874. Then data are smoothed with affine lines.

Pulses Toutain (1971, p. 1929) gives data for a period covering 1815-1939, with the exception of 1920 (we used the data from the yearbook) and of 1910 (we used the yearbook giving 236,531T, instead of the 220,000T given by Toutain).

Cereals For period 1815-1930, if data were missing in the yearbooks, we used the "other cereals" category as a missing data filling box. Other cereals then become the amount of cereals evaluated by Toutain (1971, p. 1918) minus data from the yearbooks.

Fruits and vegetables Toutain (1971, p. 1931-1937) gives data for a period covering 1855-1945. When only a total for fruit and vegetables was given, we keep the ratio fruit/vegetables given for 1882 and extrapolate a separate weight for fruit and vegetable.

Fodder rutabagas and cabbages Data are given in statistics in 1852 and 1910. Missing data are estimated from 1815 to 1910 thanks to an affine line.

Fodder roots One point exists in 1885. Using the same slope as the one for fodder turnips (data from 1852 to 1910), missing data are estimated back to 1815 thanks to this affine line.

Artificial grasslands We have data in 1840, 1852, 1862, and from 1885 onwards for artificial grasslands (sainfoin, alfalfa, clover). Missing data are estimated thanks to affine lines.

Natural grasslands We have data in 1840, 1852, 1862, and from 1885 onwards for natural grasslands. Missing data are estimated thanks to affine lines.

4 Association table

Categories followed by a star were either estimated or converted. Hence these data are not raw data from our sources.

ASSOCIATION TABLE

between the *Annaires Statistiques* and the MFA methodology

MATERIAL FLOW ANALYSIS				ANNUAIRE STATISTIQUE
D2	CAT. D2	D3	CAT. D3	
A.1.1	Primary crops	A.1.1.1	Cereals.....	Avoine, Blé, Maïs, Orge, Riz, Sarrasin, Seigle
A.1.1	Primary crops	A.1.1.10	Other crops	Houblon, Tabac.....
A.1.1	Primary crops	A.1.1.2	Roots, tubers	Pommes de terres, Topinambours
A.1.1	Primary crops	A.1.1.3	Sugar crops	Betteraves industrielles,
A.1.1	Primary crops	A.1.1.4	Pulses.....	Févéroles, Fèves, Haricots secs, Lentilles, Pois secs.....
A.1.1	Primary crops	A.1.1.6	Oil bearing crops..	Colza, Soja, Tournesol
A.1.1	Primary crops	A.1.1.7	Vegetables	Artichauts, Asperges, Carottes potagères, Choux-fleurs, Fraises, Haricots verts, Laitues, Melons, Oignons, Petits pois, Poireaux, Tomates.....
A.1.1	Primary crops	A.1.1.8	Fruits.....	Abricot, Cerise, Châtaigne, Clémentine, Noix, Olive, Pêche, Poire de table, Pomme de table Prune, Raisin de table, Raisin de cuve*
A.1.1	Primary crops	A.1.1.9	Fibres.....	Chanvre (filasse), Chanvre (grains), Chanvre papier (filasse), Chanvre papier (grains), Lin (filasse), Lin (grains).....
A.1.2	Crop residues (used).....	A.1.2.1	Straw	Paille de blé*
A.1.2	Crop residues (used).....	A.1.2.2	Other crop residues	Résidu de riz*, maïs*, autres céréales*, racines et tubercules*, légumineuses (hors haricots secs)*, haricots secs*, colza*, tournesol*, autres oléagineux*
A.1.3	Fodder crops and grazed biomass.....	A.1.3.1	Fodder crops (incl. harvest from grass-land).....	Prairies artificielles, Prairies temporaires, Production en sec - total, Racines et tubercules fourragers, Surfaces toujours couvertes d'herbe
A.1.4	Wood.....	A.1.4.1	Timber (Industrial roundwood).....	Bois sous rails*, Bois d'ouvrage - conifères*, Bois d'ouvrage - feuillus*, Bois d'industrie - conifères*, Bois d'industrie - feuillus*, Sciages de bois tropicaux*
A.1.4	Wood.....	A.1.4.2	Wood fuel and other extraction...	Conifères*, Feuillus*, Autres*
A.1.5	Fish capture and other aquatic animals.....	A.1.5.1	Fish capture	Poissons
A.1.5	Fish capture and other aquatic animals.....	A.1.5.2	All other aquatic animals and plants	Crustacés, Algues
A.2.1	Iron ores....	A.2.1.1	Iron ores - gross ore	Minerai brut de fer.....
A.2.2	Non-ferrous metal ores..	A.2.2.1	Copper ores - gross ore.....	Minerai brut de cuivre*
A.2.2	Non-ferrous metal ores..	A.2.2.2	Nickel ores - gross ore.....	Minerai brut de nickel*.....

MATERIAL FLOW ANALYSIS				ANNUAIRE STATISTIQUE
D2	CAT. D2	D3	CAT. D3	
A.2.2	Non-ferrous metal ores ..	A.2.2.3	Lead ores - gross ore.....	Minerai brut de plomb*.....
A.2.2	Non-ferrous metal ores ..	A.2.2.4	Zinc ores - gross ore	Zinc (blende crue et calamine)*.....
A.2.2	Non-ferrous metal ores ..	A.2.2.5	Tin ores - gross ore	Minerai brut d'étain*.....
A.2.2	Non-ferrous metal ores ..	A.2.2.6	Gold, silver, platinum and other precious metal ores - gross ore.....	Minerai aurifère brut.....
A.2.2	Non-ferrous metal ores ..	A.2.2.7	Bauxite and other aluminium ores - gross ore.....	Bauxite.....
A.2.2	Non-ferrous metal ores ..	A.2.2.8	Uranium and thorium ores - gross ore	Minerai brut d'uranium.....
A.2.2	Non-ferrous metal ores ..	A.2.2.9	Other metal ores - gross ore.....	Minerai brut d'antimoine*.....
A.3.1	Ornamental or building stone.....	A.3.1.1	Marble, solid.....	Marbre - Dalles brutes et Tranches délitées..
A.3.1	Ornamental or building stone.....	A.3.1.2	Granite, solid.....	Granit - Blocs bruts, Bordures de trottoirs, Moellons, Pavés d'échantillons et Pavés mosaïques.....
A.3.1	Ornamental or building stone.....	A.3.1.3	Sandstone, solid...	Appareils sanitaires en céramique, Carreaux de faïence, Carreaux en céramique et en terre commune, Poterie culinaire et horticole, Vaiselle de faïence.....
A.3.1	Ornamental or building stone.....	A.3.1.6	Stone (default value if no other specifications are available).....	Autres pierres concassées et poudres.....
A.3.2	Limestone, gypsum, chalk, and dolomite....	A.3.2.1	Limestone.....	Chaux et coment, Ensemble des castines, Pierres à chaux pour sucreries, Scories de déphosphoration brutes.....
A.3.2	Limestone, gypsum, chalk, and dolomite....	A.3.2.2	Gypse.....	Gypse cru, Plâtre de construction, Plâtres spéciaux à mouler.....
A.3.3	Slate.....	A.3.3.1	Slate, solide.....	Ardoise.....
A.3.4	Gravel and sand.....			Amiante-ciment total, Bordures, Cailloux, Gravillons, Matériaux concassés de roche et de laitier, Moellons et hourdis, Plaques de couverture (type ardoise), Plaques ondulaires, Plaques planes, Sables, Sables industriels, Supports en béton, Tout venant, Tuyaux armés, Tuyaux d'assainissement, Tuyaux et produits divers, Tuyaux non armés.....
A.3.5	Clays and kaolin.....			Kaolin, Produits réfractaires, Terres réfractaires broyées, Terres réfractaires broyées, Terres réfractaires crues, Tuiles et briques.....

MATERIAL FLOW ANALYSIS				ANNUAIRE STATISTIQUE
D2	CAT. D2	D3	CAT. D3	
A.3.6	Chemical and fertilizer minerals			Chlorure de sodium en dissolution, Chlorures marchands fabriqués de sels de potassium naturels, Extraction nette de sels de potassium naturels (poids en K ₂ O)
A.3.7	Salt			Sel de mer, Sel gemme, Sel ignigène
A.3.8	Other mining and quarrying products n.e.c	A.3.8.1	Bitumen and asphalt, natural asphaltites and asphaltic rock	Roches asphaltiques
A.3.8	Other mining and quarrying products n.e.c	A.3.8.5	Quartz and quartzites	Quartz et quartzites
A.3.8	Other mining and quarrying products n.e.c	A.3.8.8	Steatite and talc . .	Talc en poudre, Talc en roche et poudre
A.3.8	Other mining and quarrying products n.e.c	A.3.8.9	Feldspar	Feldspath brut
A.3.8	Other mining and quarrying products n.e.c	A.3.8.10	Fluor	Spath - Fluor brut
A.3.8	Other mining and quarrying products n.e.c			Minéraux divers - asphalte, talx, etc.
A.4.1	Brown coal .			Lignite
A.4.2	Hard coal . .			Houille
A.4.3	Petroleum (including natural gas liquids)			Pétrole brut
A.4.4	Natural gas .			Gaz naturel*
A.4.6	Oil shale and tar sand			Huile de schiste

ASSOCIATION TABLE

between the *Tableau général du commerce extérieur* and the MFA methodology (1948 – 1988)

The table below refers the sections of the *Tableau général du commerce extérieur*, level 1 to 3, required, and indicates their chosen correspondences with the Physical Trade Balance table of the Material Flow Analysis methodology. . The reference nomenclature is that of 1970 (and its minor variations from 1956 to 1982), the column “1948 - 1956” refers to the correspondences between this reference nomenclature and the nomenclature of 1948 (and its minor variations of 1953), and the column “1988” refers to the correspondences between this reference nomenclature and the 1988 nomenclature.

Some remarks, the correspondences between the nomenclature of 1948 and 1970 are given provisionally for the section 26. Metallurgical ores, slag and ash. For the threads and fabrics 50. to 58. Sections, the nomenclature changes between 1948 and 1970 are so important that we favored a simpler approach, separating the following categories: *Textile Fibers in Biomass* and *Textile Synthetic Fibers* from 1948 to 1956.

1948 – 1956	COMMERCE EXTÉRIEUR		MATERIAL FLOW ANALYSIS
	1956 – 1982	1988	
01-1.	1. Animaux vivants	1.	B.1.7.1 Live animals other than in 1.5.....
01-2.	2. Viandes et abats.....	2.	B.1.7.2 Meat and meat preparations
01-3 (sauf 01-34, 01-35)	3. Poissons, crustacés et mollusques (sauf 3.03).....	3. (sauf 3.03)	B.1.5.1 Fish capture.....
01-34, 01-35.....	3.03 Crustacés, mollusques et coquillages frais, séchés, salés simplement cuits à l’eau	3.03	B.1.5.2 All other aquatic animals and plants.....
01-4.....	4. Lait et produits de laiterie, œufs et miel.....	4.	B.1.7.3 Dairy products, birds eggs, and honey
01-5.....	5. Matières premières et autres produits bruts d’origine animale .	5.	B.1.7.4 Other products from animals (animal fibres, skins, furs, leather etc.)
02-1.....	6. Plantes vivantes et produits de floriculture	6.	B.1.1.10 Other crops, primary and processed.....
02-2.....	7. Légumes, plantes, racines et tubercules alimentaires	7.	B.1.1.7 Vegetables, primary and processed.....
02-3.....	8. Fruits comestibles	8.	B.1.1.8 Fruits, primary and processed
02-4.....	9. Café, thé et épices	9.	B.1.1.10 Other crops, primary and processed.....
02-5.....	10. Céréales.....	10.	B.1.1.1 Cereals, primary and processed
02-6.....	11. Produits de la minoterie, malt, amidons et féculés	11.	B.1.1.1 Cereals, primary and processed
02-71.....	12.01 Graines et fruits oléagineux, mêmes concassés	12.01, 12.02, 12.03, 12.04, 12.05, 12.06, 12.07.....	B.1.1.6 Oil bearing crops, primary and processed
.....	12.02 Farines d’oléagineux, non déshuilés, à l’exclusion de la farine de moutarde.....	12.08.....	B.1.1.6 Oil bearing crops, primary and processed
02-72.....	12.03 Graines, spores et fruits à ensementer.....	12.09.....	B.1.1.10 Other crops, primary and processed.....

1948 – 1956	COMMERCE EXTÉRIEUR 1956 – 1982	1988	MATERIAL FLOW ANALYSIS
02-73, 02-74.....	12.04 Betteraves et cannes à sucre	12.12 (<i>bet- teraves à su- cre, cannes à sucre</i>).....	B.1.1.3 Sugar crops, primary and processed.....
02-75.....	12.05 Racines de chicorée non tor- réfiées.....	12.12 (<i>chicorée</i>)...	B.1.1.7 Vegetables, primary and processed.....
02-76.....	12.06 Houblon.....	12.10.....	B.1.1.10 Other crops, primary and processed.....
02-77.....	12.07 Plantes, graines et fruits utilisés en parfumerie, en médecine ou à usages d'in- secticides.....	12.11.....	B.1.1.10 Other crops, primary and processed.....
.....	12.08 Caroubes, noyaux de fruits et végétaux alimentaires ndca....	12.12 (<i>sauf betteraves à sucre, cannes à sucre, chicorée</i>)...	B.1.1.10 Other crops, primary and processed.....
02-79.....	12.09 Pailles et balles de céréales brutes.....	12.13.....	B.1.2.1 Straw.....
02-78.....	12.10 Betteraves et racines four- ragères, foin, luzerne et autres produits fourragers.....	12.14.....	B.1.3.1 Fodder crops (incl. biomass harvested from grass- land).....
02-8.....	13. Matières premières pour la teinture et le tannage, gommés, résines et autres sucs et extraits végétaux.....	13.....	B. 1.8 Products mainly from biomass.....
02-9.....	14. Matières à tresser et à tailler et autres matières premières et produits bruts d'origine végétale.	14.....	B. 1.8 Products mainly from biomass.....
03-1, 03-2, 03-3, 03-4..	15. Graisses et huiles, produits de leur dissociation.....	15.....	B.1.1.6 Oil bearing crops, primary and processed.....
04-1.....	16. Préparations et conserves de viandes, de poissons, de crus- tacés et de mollusques (<i>sauf 16.04, 16.05</i>).....	16. (<i>sauf 16.04, 16.05</i>).....	B. 1.7.2 Meat and meat prepara- tions.....
04-15.....	16.04 Préparations et conserves de poissons.....	16.04.....	B.1.5.1 Fish capture.....
04-16, 04-17.....	16.05 Crustacés et mollusques pré- parés ou conservés.....	16.05.....	B.1.5.2 All other aquatic animals and plants.....
04-2.....	17. Sucres et sucreries.....	17.....	B.1.1.3 Sugar crops, primary and processed.....
04-3.....	18. Cacao et ses préparations....	18.....	B.1.1.10 Other crops, primary and processed.....
04-4.....	19. Préparations à base de farines ou de féculés.....	19.....	B.1.1.1 Cereals, primary and pro- cessed.....
04-5.....	20. Préparations de légumes, de plantes potagères, de fruits et d'autres plantes ou parties de plantes.....	20.....	B. 1.8 Products mainly from biomass.....
04-6.....	21. Préparations alimentaires di- verses.....	21.....	B. 1.8 Products mainly from biomass.....
04-7.....	22. Boissons, liquides alcooliques et vinaigres (<i>sauf 22.01</i>).....	22. (<i>sauf 22.01</i>).....	B. 1.8 Products mainly from biomass.....

1948 – 1956	COMMERCE EXTÉRIEUR 1956 – 1982	1988	MATERIAL FLOW ANALYSIS
04-71.....	22.01 Eaux, Eaux minérales, eaux gazeuses, glace et neige.....	22.01.....	.... <i>Hors-nomenclature MFA</i>
04-8.....	23. Résidus et déchets des industries alimentaires; aliments préparés pour animaux.....	23.....	B. 1.8 Products mainly from biomass.....
04-9.....	24. Tabacs.....	24.....	B.1.1.10 Other crops, primary and processed.....
05-11.....	25.01 Sels, eaux-mères de salines, eau de mer.....	25.01.....	B.3.7 Salt.....
.....	25.02 Pyrites de fer non grillées..	25.02.....	B.2.1 Iron ores and concentrates, iron and steel.....
05-12.....	25.03 Soufres.....	25.03.....	B.3.6 Chemical and fertilizer minerals.....
.....	25.04 Graphite naturel.....	25.04.....	B.3.8 Other mining and quarrying products n.e.s.....
05-24.....	25.05 Sables naturels à l'exclusion des sables du 26.01.....	25.05.....	B.3.4 Gravel and sand.....
05-18.....	25.06 Quartz.....	25.06.....	B.3.8 Other mining and quarrying products n.e.s.....
05-17.....	25.07 Argiles (sauf 68.07).....	25.07, 25.08	B.3.5 Clays and kaolin.....
.....	25.08 Craie.....	25.09.....	B.3.2 Limestone and gypsum, chalk and dolomite.....
05-25.....	25.09 Terres colorantes, oxydes de fer micarés naturels.....	.....	B.3.8 Other mining and quarrying products n.e.s.....
.....	25.10 Phosphates de calcium naturels, craies phosphatées.....	25.10.....	B.3.2 Limestone and gypsum, chalk and dolomite.....
.....	25.11 Sulfate et carbonate de baryum naturel.....	25.11.....	B.3.6 Chemical and fertilizer minerals.....
.....	25.12 Terres d'infusoires, farines silicieuses fossiles.....	25.12.....	B.3.8 Other mining and quarrying products n.e.s.....
05-26.....	25.13 Pierre ponce, émeri et autres abrasifs naturels.....	25.13.....	B.3.8 Other mining and quarrying products n.e.s.....
05-21.....	25.14 Ardoise brute, dégrossie ou débitée par sciage.....	25.14.....	B.3.3. Slate.....
05-22.....	25.15 Pierres calcaires de taille ou de construction de densité apparente [...].....	25.15.....	B.3.1 Ornamental or building stone.....
.....	25.16 Autres pierres de taille ou de construction.....	25.16.....	B.3.1 Ornamental or building stone.....
05-23.....	25.17 Pierres concassées, cailloux, graviers, éclats et poudres des pierres des 25,15 et 25,16.....	25.17.....	B.3.4 Gravel and sand.....
.....	25.18 Dolomie, brute, dégrossie, pisé de dolomie.....	25.18.....	B.3.2 Limestone and gypsum, chalk and dolomite.....
.....	25.19 Carbonate de magnésium naturel (magnésite), à l'exclusion de l'oxyde de magnésium.....	25.19.....	B.3.6 Chemical and fertilizer minerals.....
05-13, 05-19, 05-27.....	25.20 Gypse, anhydride, plâtre...	25.20.....	B.3.2 Limestone and gypsum, chalk and dolomite.....
.....	25.21 Castines et pierres à chaux ou à ciment.....	25.21.....	B.3.6 Chemical and fertilizer minerals.....

1948 – 1956	COMMERCE EXTÉRIEUR 1956 – 1982	1988	MATERIAL FLOW ANALYSIS
05-28.....	25.22 Chaux ordinaire, chaux hydrauliques.....	25.22.....	B.3.6 Chemical and fertilizer minerals.....
.....	25.23 Ciments hydrauliques.....	25.23.....	B.3.10 Products mainly from non metallic minerals.....
05-14.....	25.24 Amiante (asbeste).....	25.24.....	B.3.6 Chemical and fertilizer minerals.....
.....	25.25 Écume de mer, ambre, ais.....	.....	B.3.8 Other mining and quarrying products n.e.s.....
05-15.....	25.26 Mica et déchets de mica.....	25.25.....	B.3.8 Other mining and quarrying products n.e.s.....
.....	25.27 Stéatite naturelle, brute ou dégrossie.....	25.26.....	B.3.8 Other mining and quarrying products n.e.s.....
.....	25.28 Cryolithe et chiolite naturelles.....	25.27.....	B.3.6 Chemical and fertilizer minerals.....
.....	25.29 Sulfure d'arsenic naturels.....	.....	B.3.6 Chemical and fertilizer minerals.....
.....	25.30 Borates et leurs concentrés.....	25.28.....	B.3.6 Chemical and fertilizer minerals.....
05-17.....	25.31 Feldspath, leuxite, nephreline, spath fluor.....	25.29.....	B.3.6 Chemical and fertilizer minerals.....
05-29.....	25.32 Matières minérales ndca, débris de poterie.....	25.30.....	B.3.10 Products mainly from non metallic minerals.....
.....	26.01.01 Pyrites de fer grillées (à partir de 1973 : 26.01.12, 26.01.14).....	.....	B.2.1 Iron ores and concentrates, iron and steel.....
05-31, 05-35.....	26.01.02. Autres minerais de fer (à partir de 1973 : 26.01.15, 26.01.16, 26.01.18, 26.01.19).....	26.01.....	B.2.1 Iron ores and concentrates, iron and steel.....
.....	26.01.03. Minerais de manganèse (à partir de 1973 : 26.01.21, 26.01.29).....	26.02.....	.2.2.9 Other metals.....
.....	26.01.24 Minerais d'uranium et Pechblende (à partir de 1973 : 26.01.31).....	26.12.....	B.2.2.8 Uranium and thorium....
.....	26.01.25. Autres minerais d'uranium (à partir de 1973 : 26.01.39).....	.....	B.2.2.8 Uranium and thorium....
.....	26.01.26. Monazite, uranothorianite et autres minerais de thorium (à partir de 1973 : 26.01.41, 26.01.49).....	.....	B.2.2.8 Uranium and thorium....
.....	26.01.28. Minerais de plomb (à partir de 1973 : 26.01.50).....	26.07.....	B.2.2.3 Lead.....
.....	26.01.29. Minerais de zinc (à partir de 1973 : 26.01.60).....	26.08.....	B.2.2.4 Zinc.....
05-32.....	26.01.41. Minerais d'aluminium (à partir de 1973 : 26.01.73).....	26.06.....	B.2.2.7 Bauxite and other aluminium.....
.....	26.01.42. Minerais de cuivre (à partir de 1973 : 26.01.71).....	26.03.....	B.2.2.1 Copper.....
.....	26.01.43. Minerais d'étain (à partir de 1973 : 26.01.75).....	.....	B.2.2.5 Tin.....

1948 – 1956	COMMERCE EXTÉRIEUR 1956 – 1982	1988	MATERIAL FLOW ANALYSIS
.....	26.01.44. Minerais de cobalt (en 1973 : 26.01.96.0 ; de 1976 à 1979 : 26.01.98.1 ; en 1982 : 26.01.97)	26.05	B.2.2.9 Other metals
.....	26.01.45. Minerais de chrome (à partir de 1973 : 26.01.77)	26.10	B.2.2.9 Other metals
.....	26.01.46. Minerais de molybdène (à partir de 1973 : 26.01.93)	26.13	B.2.2.9 Other metals
.....	26.01.47. Minerais de tungstène (à partir de 1973 : 26.01.81)	26.11	B.2.2.9 Other metals
.....	26.01.48. Minerais de titane (à partir de 1973 : 26.01.82, 26.01.84)	26.14	B.2.2.9 Other metals
.....	26.01.49. Minerais de béryllium (à partir de 1973 : absent) .....	.....	B.2.2.9 Other metals
.....	26.01.50. Minerais de niobium et de tantale (à partir de 1973 : 26.01.85)	26.15	B.2.2.9 Other metals
.....	26.01.52. Minerais de zirconium (à partir de 1973 : 26.01.94) .....	.....	B.2.2.9 Other metals
.....	26.01.53. Minerais d'antimoine (à partir de 1973 : 26.01.91) .....	.....	B.2.2.9 Other metals
.....	26.01.55. Minerais de métaux pré- cieux (à partir de 1973 : 26.01.87)	26.16	B.2.2.6 Gold, silver, platinum and other precious metal
05-34	26.01.96.1 Minerais de nickel (à partir de 1973) (à partir de 1976 : 26.01.95.0)	26.04	B.2.2.2 Nickel
05-33, 05-36	26.01.59. Autres minerais métal- lurgiques n.d.a (de 1956 à 1967 : 26.01.54; 1973 à 1976 : 26.01.99 ; de 1979 à 1982 : 26.01.96.0, 26.01.98.2)	26.17	B.2.2.9 Other metals
05-37	26.02 Scories, laitiers, ballitures et résidus de la fabrication du fer ou de l'acier	26.19	B.2.1 Iron ores and concentrates, iron and steel
.....	26.03 Cendres et résidus métal- liques autres	26.20	B.2.3 Products mainly from met- als
.....	26.04 Autres scories et cendres... « Combustibles minéraux fossiles >>	26.11	B.5 Other products
05-41	27.01 Houilles et combustibles solides à base de houille	B.4.2 Hard coal	
.....	27.02 Lignite et agglomérés de lignite	27.01	B.4.2 Hard coal
.....	27.02 Lignite et agglomérés de lignite	27.02	B.4.1 Brown coal
.....	27.03 Tourbe et agglomérés de tourbe	27.03	B 4.5 Peat
05-69	27.04 Coke et semis-coke	27.04	B.4.2 Hard coal
.....	27.05 Charbon de cornue .....	.....	B.4.2 Hard coal
05-43	27.06 Goudrons de minéraux ...	27.06	B.4.2 Hard coal
05-44	27.07 Produits de la distillations des goudrons de houille	27.07	B.4.2 Hard coal
.....	27.08 Brai et coke de brai de goudrons minéraux	27.08	B.4.2 Hard coal

1948 – 1956	COMMERCE EXTÉRIEUR 1956 – 1982	1988	MATERIAL FLOW ANALYSIS
05-63, 05-64, 05-61.....	27.09 Huiles brute de pétrole ou de schistes (autres que brutes)....	27.09.....	B.4.3 Petroleum (including natural gas liquids).....
05-65.....	27.10 Huiles de pétrole ou de schistes (autres que brutes).....	27.10.....	B.4.3 Petroleum (including natural gas liquids).....
05-62, 05-42.....	27.11 Gaz de pétrole et autres hydrocarbures gazeux.....	27.11.....	B.4.4 Natural gas.....
05-66.....	27.12 Vaseline.....	27.12.....	B.4.3 Petroleum (including natural gas liquids).....
05-67.....	27.13 Paraffine, cires de pétrole ou de schistes.....	.....	B.4.3 Petroleum (including natural gas liquids).....
05-68.....	27.14 Résidu des huiles de pétrole ou de schistes.....	27.13.....	B.4.3 Petroleum (including natural gas liquids).....
05-5.....	27.15 Bitumes naturels et asphaltes naturels.....	27.14.....	B.4.3 Petroleum (including natural gas liquids).....
05-7.....	27.16 Mélanges bitumineux.....	27.15.....	B.4.3 Petroleum (including natural gas liquids).....
05-8.....	27.17 Énergie électrique.....	27.17.....	.... <i>Hors-nomenclature MFA</i>
.....	27.18 Gaz d'éclairage, gaz pauvre et gaz à l'eau.....	27.05.....	B.4.3 Petroleum (including natural gas liquids).....
.....	28. Produits chimiques inorganiques (sauf 28.52).....	28. (sauf 28.46).....	B.3.6 Chemical and fertilizer minerals.....
06-16.....	28.52 Sels et autres composés du thorium, de l'uranium et des métaux des terres rares.....	28.46.....	B.2.2.8 Uranium and thorium....
06-2, 06-3..	29. Produits chimiques organiques.....	29.....	B.4.6 Products mainly from petroleum products.....
07-1.....	30. Produits pharmaceutiques...	30.....	B.5 Other products.....
07-21.....	31.01 Engrais naturels d'origine animale ou végétale.....	31.01.....	B. 1.8 Products mainly from biomass.....
07-22.....	31.02 Engrais minéraux ou chimiques azotés.....	31.02.....	B.3.6 Chemical and fertilizer minerals.....
07-23.....	31.03 Engrais minéraux ou chimiques phosphatés.....	31.03.....	B.3.6 Chemical and fertilizer minerals.....
07-24.....	31.04 Engrais minéraux ou chimiques potassiques.....	31.04.....	B.3.6 Chemical and fertilizer minerals.....
07-25.....	31.05 Autres engrais présentés en emballages d'un poids brut maximum de 10kg.....	31.05.....	B.5 Other products.....
07-31, 07-32.....	32.01 Extraits tannants d'origine végétale.....	32.01.....	B.1.4.2 Wood fuel and other extraction, primary and processed.
07-33.....	32.02 Tanins (acides tanniques) et leurs dérivés.....	.....	B.1.4.2 Wood fuel and other extraction, primary and processed.
.....	32.03 Produits tannants synthétiques; conflits artificiels.....	32.02.....	B.4.6 Products mainly from petroleum products.....
07-34, 07-35.....	32.04 Matières colorantes d'origines végétales.....	32.03.....	B. 1.8 Products mainly from biomass.....
07-38, 07-37.....	32.05 Matières colorantes organiques synthétiques.....	32.04.....	B.4.6 Products mainly from petroleum products.....
07-39.....	32.06 Laques colorantes.....	32.05.....	B.4.6 Products mainly from petroleum products.....
07-36.....	32.07 Autres matières colorantes.	32.06.....	B.4.6 Products mainly from petroleum products.....

1948 – 1956	COMMERCE EXTÉRIEUR 1956 – 1982	1988	MATERIAL FLOW ANALYSIS
07-48.	32.08 Pigments, opacifiants et couleurs préparés	32.07, 32.12	B.5 Other products
07-42.	32.09 Vernis et peintures	32.08, 32.09, 32.10	B.5 Other products
07-41, 07-47.	32.10 Couleur pour la peinture artistique	=32.13	B.5 Other products
.....	32.11 Siccatis préparés	32.11	B.5 Other products
07-43.	32.12 Enduits, y compris les mastics et ciments de résine	32.14	B.5 Other products
07-44, 07-45, 07-46.	32.13 Encre à écrire ou à dessiner et autres encre	32.15	B.5 Other products
07-5.	33. Huiles essentielles et essences; articles de la parfumerie	33.	B.5 Other products
07-6. (<i>sauf</i> 07-67, 07-69)	34. Dérivés des corps gras naturels ou synthétiques; savons; cires artificielles; bougies, lessives	34.	B.5 Other products
07-67, 07-69.	35. Matières albuminoïdes; et colles diverses	35.	B. 1.8 Products mainly from biomass
07-7.	36. Poudres; explosifs; articles de pyrotechnie; allumettes; ferrocérium; matières inflammables; extincteurs	36.	B.5 Other products
07-8.	37. Surfaces sensibles; films; produits pour la photographie et la cinématographie	37.	B.5 Other products
07-9.	38. Produits divers des industries chimiques	38.	B.3.6 Chemical and fertilizer minerals
08-1, 08-2..	39. Plastiques artificiels, éthers, esters de cellulose, résines artificielles et leurs ouvrages	39.	B.4.6 Products mainly from petroleum products
08-3.	40. Caoutchouc et ouvrages en caoutchouc (<i>sauf 40.01, 40.02</i>)	40. (<i>sauf 40.01, 40.02</i>)	B.5 Other products
08-31	40.01 Caoutchouc naturel et gommés naturelles à l'état brut ..	40.01	B.1.4.2 Wood fuel and other extraction, primary and processed .
.....	40.02 Caoutchouc synthétiques, factice pour caoutchouc	40.02	B.4.6 Products mainly from petroleum products
09-1, 09-2, 09-3, 09-4..	41. Cuirs et peaux	41.	B.1.7.4 Other products from animals (animal fibres, skins, furs, leather etc.)
09-5.	42. Ouvrages en cuir et boyaux, articles de sellerie, bourrellerie, voyages, gainerie	42.	B. 1.7.4 Other products from animals (animal fibres, skins, furs, leather etc.)
09-6.	43. Pelleteries et fourrures	43.	B. 1.7.4 Other products from animals (animal fibres, skins, furs, leather etc.)
10-1.	44. Bois et ouvrages en bois	44.	B.1.4.1 Timber, primary and processed
10-5.	45. Liège et ouvrages en liège	45.	B.1.4.1 Timber, primary and processed

1948 – 1956	COMMERCE EXTÉRIEUR 1956 – 1982	1988	MATERIAL FLOW ANALYSIS
10-6.	46. Ouvrage de sparterie et de vannerie.....	46.....	B.1.1.9 Fibres, primary and processed.....
11-1.	47. Matières servant à la fabrication du papier.....	47.....	B.1.4.1 Timber, primary and processed.....
11-2, 11-3, 11-4.	48. Papier et carton, ouvrages en pâte de cellulose en papier et en carton.....	48.....	B.1.4.1 Timber, primary and processed.....
11-5.	49. Produits de l'industrie du livre et produits des arts graphiques ..	49.....	B.1.4.1 Timber, primary and processed.....
12-1 (sauf 12-12, 12-16), 12-2 (sauf 12-24, 12-28), 12-3, 12-4 (sauf 12-44, 12-48, 12-49), 12-5, 12-6, 12-7, 12-9.	« <i>Fibres textiles en biomasse</i> »	.....	B.1.1.9 Fibres, primary and processed.....
12-12, 12-16, 12-24, 12-28, 12-29, 12-44, 12-48, 12-49.	« <i>Fibres textiles synthétiques</i> »	.....	B.4.6 Products mainly from petroleum products.....
.....	50. Soie, bourre de soie et bourrette de soie.....	50.....	B. 1.7.4 Other products from animals (animal fibres, skins, furs, leather etc.).....
.....	51. Textiles synthétiques et artificiels, continus.....	54.....	B.4.6 Products mainly from petroleum products.....
.....	52. Fils métalliques.....	.....	== B.2.3 Products mainly from metals.....
.....	53. Laine, poils et crin.....	51.....	B.1.7.4 Other products from animals (animal fibres, skins, furs, leather etc.).....
.....	54. Lin et ramie.....	53.....	B.1.1.9 Fibres, primary and processed.....
.....	55. Coton.....	52.....	B.1.1.9 Fibres, primary and processed.....
.....	56. Textiles synthétiques et artificiels, discontinus.....	55.....	B.4.6 Products mainly from petroleum products.....
.....	57. Autres fibres textiles synthétiques, fils de papier et tissus de fils de papier.....	.....	B.4.6 Products mainly from petroleum products.....
.....	58. Tapis et tapisserie, velours, peluche, tulle, dentelle, passementerie.....	57, 58, 59..	B. 1.8 Products mainly from biomass.....

1948 – 1956	COMMERCE EXTÉRIEUR 1956 – 1982	1988	MATERIAL FLOW ANALYSIS
12-8.	59. Ouates et feutres, cordage et article de corderie, tissus spéciaux, tissus imprégné ou enduits, articles techniques en matière textile	56.	B.1.1.9 Fibres, primary and processed
13-5.	60. Bonneterie.....	60, 61.....	B. 1.8 Products mainly from biomass
13-1, 13-2, 13-3.	61. Vêtement et accessoires du vêtement en tissu.....	.....	B. 1.8 Products mainly from biomass
13-4.	62. Autres articles confectionnés en tissu.....	62.	B. 1.8 Products mainly from biomass
13-6.	63. Friperie, drilles, et chiffons...	63.	B. 1.8 Products mainly from biomass
14.1.	64. Chaussures (guêtres) et articles similaires.....	64.	B.5 Other products.....
14-2.	65. Coiffure ou partie de coiffure.	65.	B. 1.8 Products mainly from biomass
14-3.	66. Parapluies, parasols, cannes, fouets, cravaches.....	66.	B.5 Other products.....
14-4.	67. Plumes de parure apprêtés et articles en plumes (et duvet), fleurs artificiels, ouvrages en cheveux, éventails	67.	B. 1.7.4 Other products from animals (animal fibres, skins, furs, leather etc.)
15-1.	68. Ouvrages en pierre et autres matières minérales.....	68.	B.3.10 Products mainly from non metallic minerals
15-2.	69. Produits céramiques.....	69.	B.3.10 Products mainly from non metallic minerals
15-3.	70. Verre et ouvrages en verre...	70.	B.3.10 Products mainly from non metallic minerals
16-1, 16-2, 16-3.	71. Perles et pierres précieuses (bijouterie, bijouterie de fantaisie)	71.	B.3.9 n.a.....
16-4.	72. Monnaies.....	.....	B.2.3 Products mainly from metals
17-1, 17-2, 17-3. <i>Au 1^{er} mai</i> 1953: 30-1, 30-2, 30-3, 30-5, 30-6, 30-7, 30-8 .	73. Fonte, fer, acier.....	72, 73.....	B.2.1 Iron ores and concentrates, iron and steel.....
17-4.	74. Cuivre.....	74.	B.2.2.1 Copper
17-5.	75. Nickel (tôle, barre, fils...)	75.	B.2.2.2 Nickel
17-6 (<i>sauf</i> 17-63, 17-64.)	76. Aluminium (barres, fils, tôle, planches...).....	76.	B.2.2.7 Bauxite and other aluminium.....
17-63, 17-64.	77. Magnésium, beryllium, glucinium	77.	B.2.2.9 Other metals
17-81.	78. Plomb.....	78.	B.2.2.3 Lead.....
17-7.	79. Zinc.....	79.	B.2.2.4 Zinc
17-82.	80. Étain.....	80.	B.2.2.5 Tin
17-8. (<i>sauf</i> 17-81, 17-82.)	81. Autres métaux communs	81.	B.2.2.9 Other metals

1948 – 1956	COMMERCE EXTÉRIEUR 1956 – 1982	1988	MATERIAL FLOW ANALYSIS
18-2.	82. Outillage à main; coutellerie, et couverts de table.....	82.	B.2.3 Products mainly from metals
18-1, 18-3..	83. Ouvrages divers en métaux communs (cadenas, serrures...)...	83.	B.2.3 Products mainly from metals
19-1, 19-2, 19-3, 19-4, 19-5, 19-6, 19-7, 19-8, 19-9.	84. Chaudières, machines, appareils et engins mécaniques	84.	B.2.3 Products mainly from metals
20-1, 20-2..	85. Machines et appareils électriques et objets servant à des usages electro-techniques (moteurs,...).....	85.	B.2.3 Products mainly from metals
21-1.	86. Véhicules pour voies ferrées et matériels de chemin de fer (pas de tramway).....	86.	B.2.3 Products mainly from metals
21-2.	87. Voitures automobiles, cycles et autres véhicules (tracteurs en plus)	87.	B.2.3 Products mainly from metals
21-4.	88. Navigation aérienne	88.	B.2.3 Products mainly from metals
21-3.	89. Navigation maritime et fluviale.....	89.	B.2.3 Products mainly from metals
22-1. 22-2..	90. Optique; appareils et instruments scientifiques, lunetteries, matériels photographiques et cinématographies, matériels médico-chirurgical.....	90.	B.5 Other products.....
22-3.	91. Horlogerie	91.	B.5 Other products.....
23-1, 23-2..	92. Instruments de musique et appareils musicaux (enregistrement et reproduction de son).....	92.	B.5 Other products.....
24-1. 24-2..	93. Armes et munitions.....	93. ....	..... <i>ignoré</i>
10-2, 10-3, 10-3,	94. Meubles, mobilier chirurgical, articles de literie et similaire	94.	B. 1.8 Products mainly from biomass
25-1.	95. Matière à tailler et à mouler à l'état travaillé, y compris les ouvrages (ivoire, nacre...) .....	.....	B. 1.7.4 Other products from animals (animal fibres, skins, furs, leather etc.)
25-2.	96. Brosses, pinceaux, balais, plumeaux et articles de tamiserie .....	.....	B. 1.8 Products mainly from biomass
25-3.	97. Jouets, jeux, articles pour divertissements, engins sportifs	95.	B.5 Other products.....
25-4.	98. Ouvrages divers	96.	B.5 Other products.....
26.	99. Objets d'art de collection et d'antiquité	97.	B.5 Other products.....
27.	100. Colis postaux.....	99.	B.5 Other products.....

5 Criticisms of agricultural statistics

Agricultural statistics were not census, but mostly consisted of surveys. Before the mid-20th century, survey methods were either very rough or non-existent. Indeed, it was only in

the 1930s that sampling and randomization methods appeared with the developments of statistics, firstly in the UK and in the US (Desrosières 1993; Didier 2009; Neyman 1934), which later allowed for the construction of representative surveys. Michel Augé-Laribé (1945, p. 69) enlightens the fact that annual reports were mainly made of "usable estimates" whose main usefulness was to represent trends and means at a macroscopic level: based on mayors self-statements (Barral 1968). Self-production of family farms was also mainly unrecorded (Moulin 1992, p. 173), even though one fourth of the total production is self-consumed in 1938 (Moulin 1992, p. 184).

Musset (1933, p. 287) also harshly criticizes the national French agricultural statistics:

The agricultural statistics of France? They are everywhere, spread, lost in the chaos of French official publications: the ones published by the Ministry of Agriculture are only a small fraction. One has never been concerned about the gathering of all data in one and about providing workers with all relevant statistical files. This indicates how unorganized is agricultural statistics. So one must look them up with extreme caution and one should improve them, if it were possible.⁵

None of the two last ten-year statistics, 1882 and 1892 has been made by statisticians specialized on their task: each of them is the work of an ad-libbed staff which had to answer an excessively vast form without any preparation.⁶

6 Conclusion

These data remains to be completed thanks to year-by-year directories or other sources. All these data should be completed or even replaced by data from each sector or specialized institutions.

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5. « Les statistiques agricoles de la France ? Elles sont partout, disséminées, perdues dans le chaos des publications officielles françaises ; celles que publie sous ce nom le ministère de l'Agriculture n'en sont qu'une faible partie. Jamais on ne s'est préoccupé de rassembler en un corps et de mettre à la disposition des travailleurs tous les documents d'ordre statistique utiles. C'est dire que la statistique agricole n'est pas organisée. ... Aussi ne les faut-il consulter qu'avec une prudence extrême et faudrait-il les amender, si la chose était possible. »

6. « Aucune des deux dernières statistiques décennales, 1882, 1892 n'a été faite par des statisticiens spécialisés dans leur tâche : chacune est l'œuvre d'un personnel improvisé, qui eut à répondre, sans préparation aucune, à un questionnaire démesurément étendu. »

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