



SCIENCE FOR POLICY BRIEF

# The European Commission's Knowledge Centre for Biodiversity



## The EU economy's dependency on nature

### ANNEXES

## Annex 1. The ENCORE approach

**Table 1** - List of ecosystem services considered in ENCORE 2024.

Category	Ecosystem service
Provisioning services	Biomass provisioning services Genetic material services Water supply Other provisioning services - Animal-based energy
Regulating and maintenance services	Global climate regulation services Rainfall pattern regulation services Local (micro and meso) climate regulation services Air filtration services Soil quality regulation services Soil and sediment retention services Soil waste remediation Water purification services Water flow regulation services Flood mitigation services Storm mitigation services Noise attenuation services Pollination services Biological control services Nursery population and habitat maintenance services Other R and M service - Dilution by atmosphere and ecosystems Other R and M service - Mediation of sensory impacts (other than noise)
Cultural services	Recreation-related services Visual amenity services Education, scientific and research services Spiritual, artistic and symbolic services

Source: ENCORE 2024

**Table 2** - Materiality ratings for ecosystem service dependencies in ENCORE 2022.

<b>Materiality Rating</b>	<b>Score</b>	<b>Impact on the production process</b>
Very High (VH)	5	The ecosystem service is critical and irreplaceable in the production process.
High (H)	4	Production process is extremely vulnerable to the disruption of the ecosystem service.
Medium (M)	3	Production process can take place without the ecosystem service due to availability of substitutes.
Low (L)	2	Most of the time, the production process can take place even with full disruption of the ecosystem service.
Very Low (VL)	1	Production process can take place even with full disruption of the ecosystem service.
No link	0	Production process is independent of the ecosystem service.

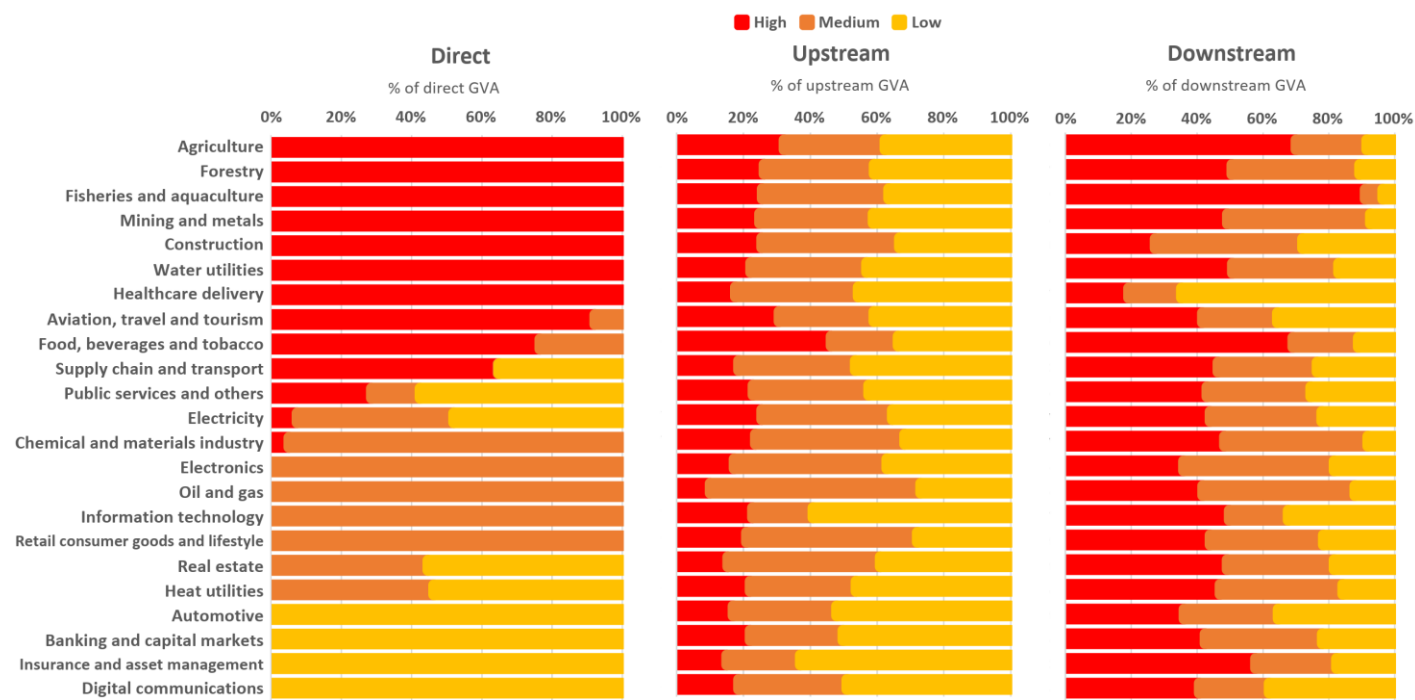
Source: ENCORE 2022

**Figure 1** - Examples of materiality ratings for ecosystem service dependencies in ENCORE 2024.

Exlobase	Exlobase	DEP_ANIMALBENR	DEP_BIOMASS	DEP_SOLIDWASTEREMEDIATION	DEP_SOILRETENTION	DEP_WATERPURIF	DEP_SOILQUALITYREG	DEP_DILUTIONBYATMOSPHERE	DEP_BIOLOGICALCONTROL	DEP_AIRFILTRATION	DEP_FLOODCONTROL	DEP_GENETICMATERIAL	DEP_GLOBALCLIMREGUL	DEP_WATERSUPPLY	DEP_NURSERY	DEP_NOISE	DEP_SENSORYIMPACTS	DEP_LOCALCLIMREGUL	DEP_POLLINATION	DEP_STORMMITIGATION	DEP_WATERFLOWREGUL	DEP_RAINFALLPATTREGUL	DEP_RECREATIONRELSERV	DEP_VISUALAMENITY	DEP_EDUCSCIENRESERV	DEP_SPIRITSYMBSERV
i01.a	Cultivation of paddy rice	3	5	3	5	5	5	3	4	3	4	5	5	4	1	0	0	5	1	5	4	5	0	0	0	0
i01.b	Cultivation of wheat	3	5	3	5	5	5	3	4	3	4	5	5	4	1	0	0	5	4	4	4	5	0	0	0	0
i01.c	Cultivation of cereal grains nec	3	5	3	5	5	5	3	4	3	4	5	5	4	1	0	0	5	4	4	4	5	0	0	0	0
i01.g	Cultivation of plant-based fibers	3	5	3	5	5	5	3	4	3	3	5	5	4	1	0	0	5	5	3	4	5	0	0	0	0
i01.h	Cultivation of crops nec	3	5	3	5	5	5	3	4	3	4	5	5	5	1	0	0	5	3	4	5	5	0	0	0	0
i01.i	Cattle farming	0	5	3	5	4	4	2	3	3	3	3	3	4	1	1	1	3	0	4	4	5	0	0	5	5
i01.j	Pigs farming	0	4	3	3	4	4	2	3	3	3	3	3	4	1	1	1	3	0	4	4	5	0	0	0	5
i01.k	Poultry farming	0	4	3	3	4	2	2	3	3	3	3	3	3	1	1	1	3	0	4	4	5	0	0	0	5
i01.l	Meat animals nec	0	4	3	3	4	4	2	3	3	3	3	3	4	1	1	1	3	0	4	4	5	0	0	0	5
i01.m	Animal products nec	0	4	3	3	4	4	2	3	3	3	3	3	4	1	1	1	3	0	4	4	5	0	0	0	5
i01.n	Raw milk	0	5	3	5	4	4	2	3	3	3	3	3	4	1	1	1	3	0	4	4	5	0	0	5	5
i01.o	Wool, silk-worm cocoons	0	3	1	3	4	2	1	2	1	1	3	2	4	1	1	1	3	0	2	3	3	0	0	5	0
i01.w.1	Manure treatment (conventional), storage and land application	0	3	1	3	4	2	1	2	1	1	3	2	4	1	1	1	3	0	2	3	3	0	0	5	0
i01.w.2	Manure treatment (biogas), storage and land application	0	3	1	3	4	2	1	2	1	1	3	2	4	1	1	1	3	0	2	3	3	0	0	5	0
i02	Forestry, logging and related service activities (02)	3	5	3	5	0	4	0	4	4	3	0	0	3	0	1	1	0	0	2	3	0	0	0	0	0
i05	Fishing, operating of fish hatcheries and fish farms; service activities incidental to fishing (05)	0	5	5	5	5	3	3	4	2	3	4	5	4	5	0	0	3	0	4	4	5	0	0	5	5
i10	Mining of coal and lignite; extraction of peat (10)	0	2	2	3	5	0	3	0	1	4	0	4	4	0	1	2	2	0	3	4	5	0	0	0	0
i12	Mining of uranium and thorium ores (12)	0	1	2	3	5	0	3	0	1	4	0	4	4	0	1	2	2	0	3	4	5	0	0	0	0
i13.1	Mining of iron ores	0	1	2	3	5	0	3	0	1	4	0	4	4	0	1	2	2	0	3	4	5	0	0	0	0
i13.20.11	Mining of copper ores and concentrates	0	1	2	3	5	0	3	0	1	4	0	4	4	0	1	2	2	0	3	4	5	0	0	0	0
i13.20.15	Mining of lead, zinc and tin ores and concentrates	0	1	2	3	5	0	3	0	1	4	0	4	4	0	1	2	2	0	3	4	5	0	0	0	0
i13.20.16	Mining of other non-ferrous metal ores and concentrates	0	1	2	3	5	0	3	0	1	4	0	4	4	0	1	2	2	0	3	4	5	0	0	0	0
i14.1	Quarrying of stone	2	2	0	4	5	0	3	0	1	4	0	4	4	0	1	2	2	0	3	4	5	0	0	0	0
i15.f	Processing of dairy products	0	0	3	2	5	0	2	1	1	3	0	1	4	0	0	1	2	0	3	4	0	0	0	0	0
i15.g	Processed rice	0	0	3	2	5	0	2	1	1	3	0	1	3	0	0	0	2	0	3	3	0	0	0	0	0
i24.b	N-fertiliser	0	0	3	3	3	0	2	0	1	3	0	1	4	0	1	1	2	0	3	4	3	0	0	0	0
i24.c	P- and other fertiliser	0	0	3	3	3	0	2	0	1	3	0	1	4	0	1	1	2	0	3	4	3	0	0	0	0
i24.d	Chemicals nec	0	0	2	3	3	0	2	0	1	3	0	1	3	0	1	1	2	0	3	3	1	0	0	0	0
i25	Manufacture of rubber and plastic products (25)	0	0	2	2	3	0	0	0	1	3	0	1	2	0	1	0	2	0	3	3	0	0	0	0	0
i26.a	Manufacture of glass and glass products	0	0	3	2	3	0	0	0	1	3	0	1	3	0	1	1	2	0	3	3	3	0	0	0	5
i26.a.w	Re-processing of secondary glass into new glass	0	0	3	2	3	0	0	0	1	3	0	1	3	0	1	1	2	0	3	3	3	0	0	0	5
i26.b	Manufacture of ceramic goods	0	0	3	2	3	0	2	0	1	3	0	1	3	0	1	1	2	0	3	3	2	0	0	0	5
i26.c	Manufacture of bricks, tiles and construction products, in baked clay	0	0	3	2	3	0	2	0	1	3	0	1	3	0	1	1	2	0	3	3	2	0	0	0	5
i26.d	Manufacture of cement, lime and plaster	0	0	3	2	3	0	2	0	1	3	0	1	3	0	1	1	2	0	3	3	2	0	0	0	5
i26.d.w	Re-processing of ash into clinker	0	0	3	2	3	0	2	0	1	3	0	1	3	0	1	1	2	0	3	3	2	0	0	0	5
i26.e	Manufacture of other non-metallic mineral products n.e.c.	0	0	3	2	3	0	2	0	1	3	0	1	3	0	1	1	2	0	3	3	2	0	0	0	5
i40.11.b	Production of electricity by gas	0	0	3	3	3	0	0	0	1	3	0	3	4	0	1	0	2	0	2	4	0	0	0	0	0
i40.11.c	Production of electricity by nuclear	0	0	2	4	3	0	1	0	1	3	0	1	4	0	1	0	2	0	2	4	0	0	0	0	0
i40.11.d	Production of electricity by hydro	0	0	2	5	2	0	0	0	0	5	0	3	5	0	0	0	2	0	3	5	0	0	0	0	0
i40.11.e	Production of electricity by wind	0	0	0	3	0	0	0	0	0	4	0	5	1	0	3	0	3	0	3	3	0	0	0	0	0
i40.11.f	Production of electricity by petroleum and other oil derivatives	0	0	3	3	3	0	0	0	1	3	0	3	4	0	1	0	2	0	2	4	0	0	0	0	0
i40.11.g	Production of electricity by biomass and waste	0	4	2	2	3	0	0	0	1	1	0	1	2	0	0	0	2	0	1	2	3	0	0	0	0
i40.11.h	Production of electricity by solar photovoltaic	0	0	0	3	0	0	0	0	0	3	0	5	3	0	1	0	3	0	3	3	0	0	0	0	0
i45	Construction (45)	1	0	1	4	3	0	2	0	1	3	0	3	3	0	1	1	2	0	3	3	5	0	0	0	0
i45.w	Re-processing of secondary construction material into aggregates	1	0	1	4	3	0	2	0	1	3	0	3	3	0	1	1	2	0	3	3	5	0	0	0	0
i50.a	Sale, maintenance, repair of motor vehicles, motor vehicles parts, motorcycles, motor cycles parts and acces	0	0	0	3	0	0	0	1	0	2	0	1	1	0	0	0	2	0	2	2	1	0	0	0	0
i50.b	Retail sale of automotive fuel	0	0	0	3	0	0	0	1	1	3	0	1	2	0	0	1	2	0	3	3	1	0	0	0	0
i51	Wholesale trade and commission trade, except of motor vehicles and motorcycles (51)	0	0	0	2	0	0	0	1	0	2	0	1	3	0	0	0	2	0	2	3	1	0	0	0	0
i52	Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods (52)	0	0	0	3	0	0	0	1	1	3	0	1	2	0	0	0	2	0	3	3	1	0	0	0	0
i55	Hotels and restaurants (55)	0	0	3	2	5	0	0	1	1	1	0	1	2	0	3	3	2	0	2	2	1	5	5	5	5
i60.1	Transport via railways	0	0	0	4	0	0	1	1	1	3	0	3	1	0	1	0	2	0	3	2	3	0	5	0	0
i60.2	Other land transport	3	0	0	2	0	0	1	0	1	3	0	3	1	0	1	0	2	0	3	2	3	0	5	0	0
i60.3	Transport via pipelines	0	0	0	4	0	0	0	1	3	3	0	1	2	0	0	0	2	0	2	3	0	0	0	0	0
i61.1	Sea and coastal water transport	0	0	0	2	3	0	1	1	1	4	0	3	2	0	0	0	2	0	4	3	3	5	5	0	0
i61.2	Inland water transport	0	0	0	3	3	0	1	1	1	4	0	3	2	0	0	0	2	0	3	3	5	5	5	0	0
i62	Air transport (62)	0	0	0	2	0	0	1	1	1	1	0	3	1	0	1	0	2	0	2	2	5	0	5	0	0
i63	Supporting and auxiliary transport activities; activities of travel agencies (63)	0	0	0	3	0	0	0	1	1	1	0	1	1	0	0	0	2	0	2	1	1	0	0	0	0
i64	Post and telecommunications (64)	0	0	0	1	0	0	0	0	0	1	0	3	1	0	0	0	2	0	2	1	3	0	0	0	0
i65	Financial intermediation, except insurance and pension funding (65)	0	0	0	1	0	0	0	0	0	1	0	3	1	0	0	0	2	0	2	1	3	0	0	0	0
i66	Insurance and pension funding, except compulsory social security (66)	0	0	0	1	0	0	0	0	0	1	0	1	1	0	0	0	2	0	1	1	0	0	0	0	0
i67	Activities auxiliary to financial intermediation (67)	0	0	0	1	0	0	0	0	0	1	0	1	1	0	0	0	2	0	1	1	0	0	0	0	0
i70	Real estate activities (70)	0	0	0	3	0	0	0	0	1	1	0	1	1	0	1	1	2	0	2	1	0	0	5	0	0
i71	Renting of machinery and equipment without operator and of personal and household goods (71)	0	0	0	2	0	0	0	0	0	3	0	1	1	0	0	0	2	0	2	2	1	5	5	0	0
i72	Computer and related activities (72)	0	0	1	1	0	0	0	0	0	3	0	1	3	0	0	0	2	0	3	2	1	0	0	0	0
i73	Research and development (73)	0	2	2	1	3	0	1	1	1	1	3	2	2	0	1	1	2	2	2	2	0	0	5	0	0
i74	Other business activities (74)	0	0	0	1	0	0	0	0	1	0	1	0	1	0	1	1	1	0	2	1	0	0	0	0	0
i75	Public administration and defence; compulsory social security (75)	0	0	0	1	0	0	0	1	0	1	0	1	2	0	0	0	2	0	1	2	1	0	0	0	0
i80	Education (80)	0	0	1	2	0	0	0	1	1	3	0	1	1	0	1	0	2	0	3	2	1	5	5	5	5
i85	Health and social work (85)	0																								

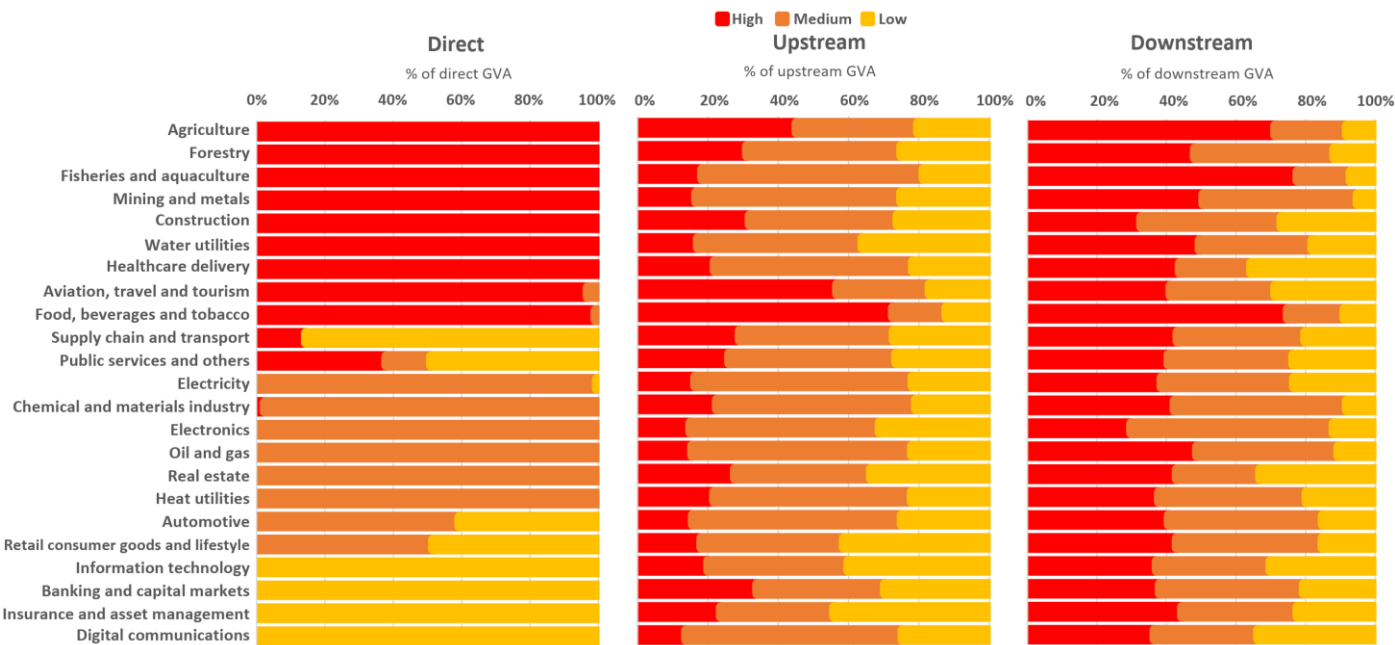
Annex 2. Additional results

Figure 1 – World economy: dependency on nature, excluding the contributions of a sector to itself.



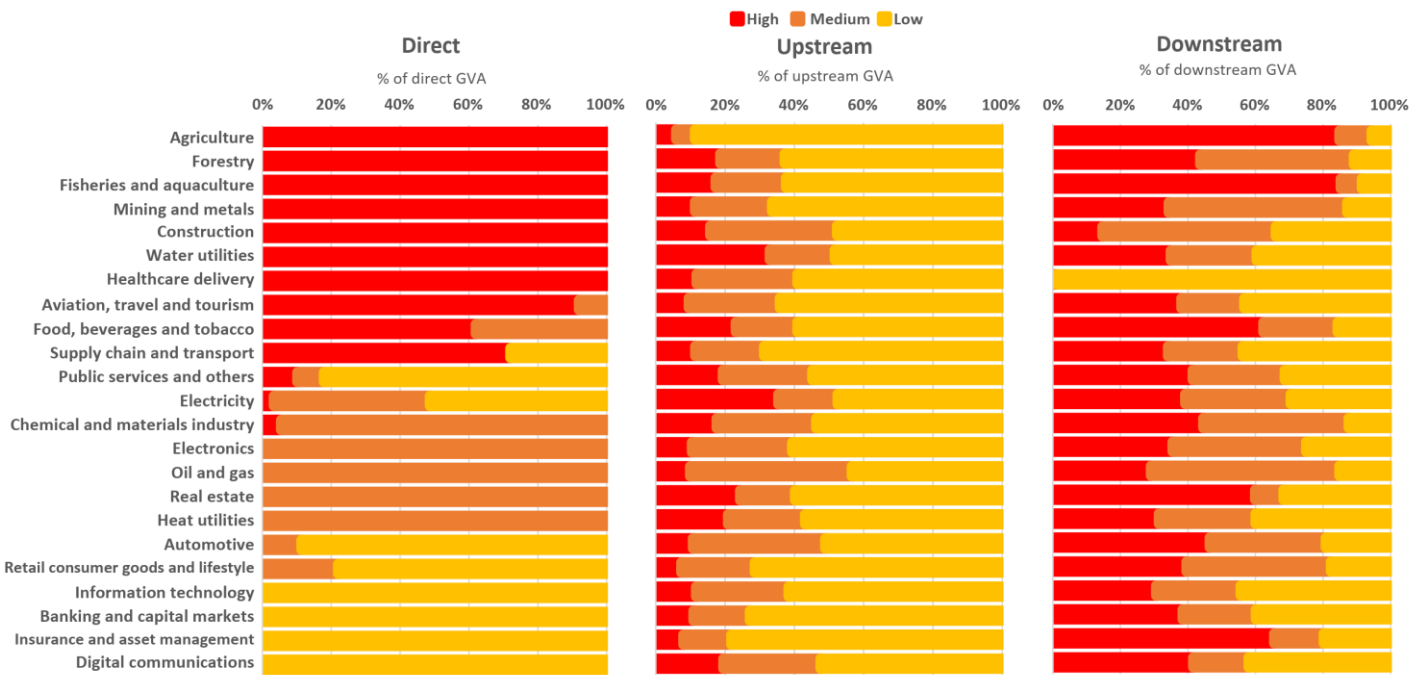
Source: ENCORE 2024, EXIOBASE 2022, JRC calculations

Figure 2 – China's economy: dependency on nature, excluding the contributions of a sector to itself.



Source: ENCORE 2024, EXIOBASE 2022, JRC calculations

**Figure 3** – US economy: dependency on nature, excluding the contributions of a sector to itself.



Source: ENCORE 2024, EXIOBASE 2022, JRC calculations

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