

Classification of Biological Resources, Derivatives and Value Added Products under the Biological Diversity Act, 2002

In order to provide clarity and transparency on classifying the biological resources, derivatives and value added products, the NBA constituted an expert committee. The committee examined the subject matters and recommended a comprehensive report categorizing materials as Biological Resources, Derivatives, Value-Added Products. The recommendation was considered and approved in the 77th Authority meeting. The categorization of the materials are placed as Annex.

List of biological resources, derivatives and value added products

Sl. No.	Items	Category			Remarks
		Biological Resources	Derivatives	Value-Added Products	
A. Plants and plant materials					
1	Gum Arabic	It is a biological resource	-	-	Gum Arabic is obtained from plants. It is a natural exudate from stem of <i>Senegalia senegal</i> (L.) Britton (Leguminosae).
2	Guar gum	-	It is a derivative	-	It is extracted from seeds of the guar or cluster bean plant, <i>Cyamopsis tetragonoloba</i> (L.) Taub. (Leguminosae).
3	Tragacanth gum	It is a biological resource	-	-	A natural gum obtained from the dried sap of species of the genus <i>Astragalus</i> .
4	Locust gum	-	It is a derivative	-	Extracted from the seeds of the Carob tree, <i>Ceratonia siliqua</i> L. (Leguminosae).
5	Okra gum	-	It is a derivative	-	It is a natural polymer obtained from the fruits of the okra plant, popularly known as ‘lady’s finger’, (<i>Abelmoschus esculentus</i> (L.) Moench (Malvaceae)).
6	Carrageenan gum	-	It is a derivative	-	Extracted from red alga, (<i>Kappaphycus alvarezii</i> (Doty) Doty ex Silva (Rhodophyceae: Solieriaceae)).
7	Psyllium gum	-	It is a derivative	-	The gum is extracted from the seed coat (husk or hull) of ispaghula or psyllium seeds of the <i>Plantago ovata</i> Forssk. (Plantaginaceae).
8	Gum ghatti	It is a biological resource	-	-	A natural gum obtained from the sap of <i>Terminalia anogeissiana</i> Gere & Boatwr. (Syn. <i>Anogeissus latifolia</i> (Roxb. ex DC.) Wall. ex Guill. & Perr.) (Combretaceae).
9	Karaya gum	It is a biological resource	-	-	Karaya gum is obtained from the sap of <i>Sterculia urens</i> Roxb. (Malvaceae). It is

					commonly called gum karaya, gum sterculia or Indian gum tragacanth.
10	Dammar gum (Sal dammar and White dammar)	It is a biological resource	-	-	A natural resin obtained from different species of the genera <i>Shorea</i> (Sal dammar), <i>Vateria</i> (white dammar) or <i>Hopea</i> (Dipterocarpaceae).
11	Black dammar, Black dhup, Raal, Raal dhup	It is a biological resource	-	-	A resinous exudate obtained from species of the genus <i>Canarium</i> (Burseraceae).
12	Gurjun balsam	It is a biological resource	-	-	Gurjun balsam is obtained from <i>Dipterocarpus turbinatus</i> C.F. Gaertn. (Dipterocarpaceae).
13	Kingiodendron balsam	It is a biological resource	-	-	Balsam is obtained as an exudate from the stem of <i>Prioria pinnata</i> (Roxb. ex DC.) Breteler (Syn. <i>Kingiodendron pinnatum</i> (Roxb. ex DC.) Harms) (Leguminosae).
14	Turpentine	-	It is a derivative	-	It is a fluid obtained by the distillation of resin, obtained mainly from <i>Pinus roxburghii</i> Sarg. (Pinaceae) and other species of conifers (<i>Pinus wallichiana</i> A.B. Jacks, <i>Pinus gerardiana</i> Wall. ex D.Don, <i>Abies pindrow</i> (Royle ex D.Don) Royle and <i>Cedrus deodara</i> (Roxb. ex D.Don) G.Don.
15	Oleoresins	-	It is a derivative	-	It is a yellowish gum-resin obtained from the stem and older branches of the guggul tree, <i>Commiphora wightii</i> (Arn.) Bhandari (Burseraceae).
16	Asafoetida	It is a biological resource	-	-	It is a dark brown, resin-like, fetid gum obtained from the root of <i>Ferula narthex</i> Boiss. (syn. <i>Ferula asafoetida</i> (Falc.) H.Karst. (Apiaceae).
17	Wheat	It is a biological resource	-	-	Seeds/grains obtained from species of the genus <i>Triticum</i> sp. (Poaceae), (wheat).

18	Atta/Wheat flour	-	It is a derivative	-	Wheat flour is the powdered form of wheat grains.
19	Multi grain flour	-	-	It is a value added product	It is a mixed flour consisting of more than one grain.
20	Refined flour / Maida	-	It is a derivative	-	Maida (refined flour) is a processed product made from wheat.
21	Semolina (coarsely milled durum wheat)	-	It is a derivative	-	It is also called suji or rava and is made from durum wheat (<i>Triticum durum</i> Desf., <i>Triticum aestivum</i> L. and <i>Triticum turgidum</i> L. (Poaceae), all of which are cultivated as edible wheat in India and commercially traded.
22	Durum wheat flour	-	It is a derivative	-	Durum wheat flour is the powdered form of durum wheat grains.
23	Enzymes	-	It is a derivative	-	Enzymes are obtained from various parts of organisms.
24	Recombinant enzymes	-	It is a derivative	-	Recombinant enzymes are produced using the genetic material of organisms through biotechnological application.
25	Proteins	-	It is a derivative	-	Proteins are obtained from plants.
26	Antibodies	-	It is a derivative	-	Antibodies are proteins that can be produced recombinantly in plants.
27	Gluten	-	It is a derivative	-	Gluten is a naturally occurring protein found in wheat and other cereal grains.
28	Peptones	-	It is a derivative	-	Peptones are obtained from the partial digestion of proteins derived from plants.
29	Sugars / Cane sugar / Palm sugar / Beet sugar	-	It is a derivative	-	Sugars such as monosaccharides, disaccharides, and oligosaccharides are mainly obtained from plants.
30	Glucose	-	It is a derivative	-	Glucose is a monosaccharide that is mainly obtained from plants.
31	Dextrose	-	It is a derivative	-	Dextrose is a monosaccharide that is mainly obtained from plants.

32	Fructose	-	It is a derivative	-	Fructose is a monosaccharide that is mainly obtained from plants.
33	Sucrose	-	It is a derivative	-	Sucrose is composed of glucose and fructose and is obtained from plants.
34	Potato Dextrose Agar	-	It is a derivative	-	Potato dextrose agar is obtained from plant sources such as plant (Potatoes), algae, corn, etc.
35	Glycerol	-	It is a derivative	-	Glycerol is also obtained from plants.
36	Agar Agar	-	It is a derivative	-	Agar Agar is a jelly-like substance consisting of polysaccharides obtained from some species of red algae, mainly from the species of the genus <i>Gracilaria</i> and other members of the family Gelidiaceae.
37	Alginate / Alginic acid and Sodium alginate	-	It is a derivative	-	Alginate is a natural polysaccharide derived specifically from brown alga seaweeds.
38	Chitosan	-	It is a derivative	-	Chitosan is a polysaccharide derived from chitin, which is obtained from plants.
39	Cellulose	-	It is a derivative	-	Cellulose and its derivatives are polysaccharides obtained from plants.
40	Dextrin	-	It is a derivative	-	Dextrin is a carbohydrate that is derived from starch.
41	Maltodextrin	-	It is a derivative	-	Maltodextrin is a polysaccharide derived from starch.
42	Starch	-	It is a derivative	-	Starch is a biopolymer / polysaccharide obtained from plants.
43	Starch ester and modified starch	-	It is a derivative	-	Starch esters and modified starches are derived from starch.
44	Polysaccharide of β -1,4 D-glucose	-	It is a derivative	-	Polysaccharide of β -1,4 D-glucose are derived from cellulose, which is a biological resource from plants.
45	Sorbitol	-	It is a derivative	-	Sorbitol is a sugar alcohol obtained from plants.

46	Mannitol	-	It is a derivative	-	Mannitol is a sugar alcohol obtained from plants.
47	Malic acid	-	It is a derivative	-	Malic acid is an organic acid obtained from plants.
48	Tartaric acid	-	It is a derivative	-	Tartaric acid is an organic acid obtained from many fruits.
49	Citric acid	-	It is a derivative	-	Citric acid is an organic acid obtained from plants.
50	Oleic acid	-	It is a derivative	-	Oleic acid is a monounsaturated omega - 9 fatty acid obtained from plants.
51	Palmitic acid	-	It is a derivative	-	Palmitic acid is a saturated fatty acid obtained from plants.
52	Humic acid	-	It is a derivative	-	Humic acid is a naturally occurring substance found in soil, formed from the decomposition of plant and microbial matter.
53	Alpha linolenic acid	-	It is a derivative	-	Alpha linolenic acid is obtained from plants.
54	Omega fatty acids	-	It is a derivative	-	Omega fatty acids are obtained from plants.
55	Sorbic acid	-	It is a derivative	-	Sorbic acid is obtained from plants.
56	Laevulin acid	-	It is a derivative	-	Laevulin acid, also known as 4-oxypentanoic acid, is obtained from plants.
57	Anisic acid	-	It is a derivative	-	Anisic acid, also known as 4-methoxybenzoic acid, is derived from plants.
58	Conjugate triene acid	-	It is a derivative	-	Conjugate triene acid is derived from triene acid.
59	Gallic acid	-	It is a derivative	-	Gallic acid is obtained from plants.
60	Tannic acid	-	It is a derivative	-	Tannic acid is obtained from plants.
61	Pyruvate / Pyruvic acid	-	It is a derivative	-	Pyruvate is a naturally occurring compound in living organisms.

62	Waxes	It is a biological resource	-	-	Waxes are obtained from surfaces of aerial plant parts.
63	Caffeine	-	It is a derivative	-	Caffeine is extracted from plants such as coffee beans, tea leaves, cocoa beans, yerba mate, guarana, kola nuts, etc.
64	Cocaine	-	It is a derivative	-	Cocaine is extracted from plants, specifically from the leaves of the coca plant.
65	Digitalis	-	It is a derivative	-	Digitalis is a steroid drug consisting of two chemically similar cardiac glycosides: digitoxin and digoxin extracted from plants, specifically from the leaves of <i>Digitalis</i> spp. (Plantaginaceae), mainly from <i>Digitalis purpurea</i> L. commonly called Foxglove.
66	Morphine	-	It is a derivative	-	Morphine is a naturally occurring alkaloid extracted from plants, specifically in the opium poppy (<i>Papaver somniferum</i> L.).
67	Codeine	-	It is a derivative	-	Codeine is extracted from plants, specifically from the opium poppy (<i>Papaver somniferum</i> L.).
68	Opium	It is a biological resource	-	-	Opium is obtained from plants, specifically from the latex of the opium poppy (<i>Papaver somniferum</i> L.).
69	Aspirin	-	It is a derivative	-	Aspirin is derived from salicylic acid, which was originally obtained from plants such as willow bark.
70	Emulsifiers	-	It is a derivative	-	Emulsifiers are extracted from plants.
71	Vegetable oils	-	It is a derivative	-	Vegetable oils are extracted from plants.
72	Essential oils	-	It is a derivative	-	Essential oils are extracted from plants by both steam or dry distillation.
73	Soya lecithin	-	It is a derivative	-	Soya lecithin is extracted from soybeans.

74	Curcumin	-	It is a derivative	-	Curcumin is the active ingredient of the dietary spice turmeric and is extracted from the rhizomes of plants of species belonging to the genus <i>Curcuma</i> (Zingiberaceae), mainly from <i>Curcuma longa</i> L.
75	Apigenin	-	It is a derivative	-	Apigenin is extracted from plants.
76	Quercetin	-	It is a derivative	-	Quercetin is extracted from plants.
77	Resveratrol	-	It is a derivative	-	Resveratrol is a polyphenol extracted from plants.
78	Piperine	-	It is a derivative	-	Piperine is extracted from plants, specifically from black pepper (<i>Piper nigrum</i> L.).
79	Gibberellic acid	-	It is a derivative	-	Gibberellic acid is extracted from plants.
80	Coumarin	-	It is a derivative	-	Coumarin is extracted from plants.
81	Stevia	-	It is a derivative	-	Stevia is derived from the leaves of the <i>Stevia rebaudiana</i> (Bertoni) Bertoni (Asteraceae).
82	Bagasse	-	It is a derivative	-	Bagasse is obtained from sugarcane.
83	Molasses	-	It is a derivative	-	Molasses is obtained as a byproduct of sugar production from sugarcane or sugar beets.
84	Forest residue / biomass	It is a biological resource	-	-	Forest waste, such as forestry residue or woody biomass, is a biological resource obtained from natural processes within forests, including fallen branches, tree trimmings, bark, and other plant materials.
85	Agro waste	It is a biological resource	-	-	Agro waste is a biological resource. It is obtained from natural organic materials generated during agricultural activities such as crop cultivation, harvesting and processing.

86	Fruit and vegetable waste	It is a biological resource	-	-	Fruit and vegetable waste are biological resources generated from the plants.
87	Rubber	-	It is a derivative	-	Rubber is derived from latex through physical and chemical processes.
88	Latex	It is a biological resource	-	-	Latex is a fluid produced by plants.
89	Linoleum	-	It is a derivative	-	Linoleum is extracted from plants, primarily from linseed oil.
90	Inks / Dyes	-	It is a derivative	-	Natural dye or colorants are obtained from plant.
91	Shilajit	It is a biological resource	-	-	Shilajit is a natural, mineral-rich substance found on the rocks in the Himalayas. It is formed by the decomposition of certain biologicals.
92	Fabric	-	It is a derivative	-	Fabric is made from plant fibers.
93	Jaggery	-	It is a derivative	-	Jaggery is obtained from plants, primarily from sugarcane or date palm sap.
94	Naringenin	-	It is a derivative	-	Naringenin is extracted from plants.
95	Isoeugenol	-	It is a derivative	-	Isoeugenol is extracted from plants.
96	Catechin	-	It is a derivative	-	Catechin is extracted from plants.
97	Thymol	-	It is a derivative	-	Thymol is extracted from plants.
98	Thymoquinone	-	It is a derivative	-	Thymoquinone is extracted from the seeds of <i>Nigella sativa</i> L. (Ranunculaceae).
B. Animals and animal materials					
1	Milk	It is a biological resource	-	-	Milk is a liquid food secreted by mammals from the mammary gland.
2	Skimmed Milk	-	It is a derivative	-	Skimmed milk is derived by removing fat from whole milk.
3	Butter	-	It is a derivative	-	Butter is a processed product made from milk.

4	Curd / Yogurt	-	It is a derivative	-	Curd / Yogurt is a processed product of milk.
5	Ghee	-	It is a derivative	-	Ghee is a processed product of milk.
6	Cheese	-	It is a derivative	-	Cheese is a processed product of milk.
7	Casein	-	It is a derivative	-	Casein is extracted from milk.
8	Casein hydrolysate	-	It is a derivative	-	Casein hydrolysate is a processed product of milk casein.
9	Milk Solids	-	It is a derivative	-	Milk solid is a dehydrated product of milk.
10	Whey / whey protein	-	It is a derivative	-	Whey / whey proteins are extracted from the milk.
11	Lac: Sticklac, Seedlac, Shellac	It is a biological resource	-	-	Lac is a type of natural resin that is formed as a result of secretion by the female Indian lac insect, <i>Kerria lacca</i> (Kerr). (Family <i>Kerridae</i>). Several other species of insects produce Lac. Lac dye and Lac wax are two by-products derived from sticklac.
12	Enzymes	-	It is a derivative	-	The commercially sourced enzymes may be prepared using the various tissues of the organisms.
13	Recombinant enzymes	-	It is a derivative	-	These are produced using genetic material of organisms through biotechnological application.
14	Proteins	-	It is a derivative	-	Proteins are also isolated from animals.
15	Antibodies	-	It is a derivative	-	Antibodies are obtained by injecting antigens to the animals.
16	Gelatin	-	It is a derivative	-	Gelatin is obtained from collagen taken from animal.
17	Meat extract	-	It is a derivative	-	Meat extract is prepared from selected animal tissues free from fat and sinew. It is a high-performance enzymatic hydrolysate of a mix of animal proteins.

18	Peptones	-	It is a derivative	-	Peptones are obtained from animals.
19	Leather	-	It is a derivative	-	Leather is derived from animal hide/skins of animals.
20	Foetal Calf Serum	-	It is a derivative	-	Foetal calf serum is a product obtained from the blood of foetal calves.
21	Woollen fibers	It is a biological resource	-	-	Woollen fibers are natural fibers obtained from animals.
22	Dry fish	It is biological resources	-	-	Dry fish is obtained by cleaning, gutting and removing its moisture by drying.
23	Dry / Smoked meat	-	It is a derivative	-	Dry / smoked meat is obtained by preserving meat by removing its moisture by smoke drying.
24	Silk	It is a biological resource	-	-	Silk is obtained from silkworm cocoon and spiders.
25	Cow Urine	It is a biological resource	-	-	Cow urine is a natural substance produced by the animal.
26	Glycerol	-	It is a derivative	-	Glycerol is obtained from animals.
27	Angiotensin	-	It is a derivative	-	Angiotensinogen, an alpha-globulin, and the peptide prohormone are obtained from liver in animals and converted into angiotensin.
28	Chitosan	-	It is a derivative	-	Chitosan is a polysaccharide derived from chitin, which is obtained from animals.
29	Lactic acid	-	It is a derivative	-	Lactic acid is obtained through fermentation processes.
30	Palmitic acid	-	It is a derivative	-	Palmitic acid is obtained from animals.
31	Hyaluronic acid	-	It is a derivative	-	Hyaluronic acid is obtained from animals.
32	Omega fatty acids	-	It is a derivative	-	Omega fatty acids are obtained from animals.
33	Pyruvate/ Pyruvic acid	-	It is a derivative	-	Pyruvate is a naturally occurring compound obtained from animals.

34	Waxes	It is a biological resource	-	-	Waxes are obtained from animals.
35	Emulsifiers		It is a derivative	-	Emulsifiers can be derived from animals.
36	Egg Lecithin	-	It is a derivative	-	Egg lecithin is extracted from eggs.
37	Slaughter-house waste	It is a biological resource	-	-	Slaughter-house wastes originate from natural organic materials specifically animal tissues.
38	Aquaculture waste	It is a biological resource	-	-	Aquaculture waste is generated from fishes, crustaceans, etc.
39	Seafood waste	It is a biological resource	-	-	Seafood waste is generated from aquatic animals.
40	Inks / Dyes	-	It is a derivative	-	Inks / Natural dyes / colorants are obtained from animals.
41	Fabric	-	It is a derivative	-	Fabric are made from animal fibers.
C. Microorganisms and microbial products					
1	Xanthan gum	-	It is a derivative	-	Xanthan gum is produced by a bacterium <i>Xanthomonas campestris</i> Pammel 1895) Dowson 1939 (Lysobacteriaceae) through fermentation of natural sugars.
2	Gellan gum	-	It is a derivative	-	Gellan gum is a water-soluble anionic polysaccharide produced by fermentation of a bacteria <i>Pseudomonas elodea</i> Vartak et al., 1995 (syn. <i>Pseudomonas elodea</i> Kang et al., 1982).
3	Enzymes	-	It is a derivative	-	Enzymes are obtained from various tissues of the organisms.

4	Recombinant enzymes	-	It is a derivative	-	Recombinant enzymes are prepared with the use of modern molecular biology techniques. The required gene encoding the enzyme may be cloned in a suitable vector and it may be overexpressed to get the enzyme of interest. These are produced using genetic material of organisms through biotechnological application.
5	Proteins	-	It is a derivative	-	Proteins are isolated from microorganisms.
6	Antibodies	-	It is a derivative	-	Antibodies are produced by the microorganisms.
7	Yeast extract	-	It is a derivative	-	Yeast extract is prepared from <i>Saccharomyces cerevisiae</i> Meyen ex E. C. Hansen (Saccharomycetaceae). It can also be produced from different species of <i>Candida</i> and <i>Kluyveromyces</i> .
8	Glycerol	-	It is a derivative	-	Glycerol is also obtained from microorganisms.
9	Ionomycin	-	It is a derivative	-	Ionomycin is a product from bacteria such as <i>Streptomyces conglobatus</i> Trajo. (Streptomycetaceae).
10	Lipopolysaccharides	-	It is a derivative	-	Lipopolysaccharides is obtained from the cell wall of Gram-negative bacteria.
11	Chitosan	-	It is a derivative	-	Chitosan is a polysaccharide derived from chitin, which is obtained from microorganisms.
12	Lactic acid	-	It is a derivative	-	Lactic acid is obtained through fermentation process.
13	Humic acid	-	It is a derivative	-	Humic acid is obtained from microorganisms.
14	Kojic acid	-	It is a derivative	-	Kojic acid is obtained from several species of fungus especially - <i>Aspergillus oryzae</i> , through fermentation processes.

15	Pyruvate/ Pyruvic acid	-	It is a derivative	-	Pyruvate is produced through microbial fermentation process.
16	Vinegar	-	It is a derivative	-	Vinegar is a produced by fermentation.
17	Waxes	-	It is a derivative	-	Waxes are derived from bacteria (<i>Bacillus</i> sp., <i>Pseudomonas</i> sp.) , yeasts , fungi (<i>Candida</i> sp., <i>Ustilago</i> sp.)
18	Emulsifiers	-	It is a derivative	-	Emulsifiers are derived from bacteria (<i>Acinetobacter</i> sp., <i>Rhodococcus</i> sp.) , microalgae (<i>Euglena</i> sp.).
19	Gibberellic acid	-	It is a derivative	-	Gibberellic acid is obtained from microorganisms.
20	Doxorubicin	-	It is a derivative	-	Doxorubicin is obtained from microorganisms.
21	Penicillin	-	It is a derivative	-	Penicillin is derived from the microorganisms.
22	Streptomycin	-	It is a derivative	-	Streptomycin is an antibiotic of microbial origin.
23	Amphotericin	-	It is a derivative	-	Amphotericin is produced by the microorganisms.
24	Kanamycin	-	It is a derivative	-	Kanamycin is an antibiotic produced by the microorganisms.
25	Cefpodoxime proxetil	-	It is a derivative	-	Cefpodoxime proxetil is extracted from Cephalosporin nucleus.
26	Chloramphenicol	-	It is a derivative	-	Chloramphenicol is extracted from the microorganisms.
27	Erythromycin	-	It is a derivative	-	Erythromycin is extracted from the microorganisms.
28	Tetracycline	-	It is a derivative	-	Tetracycline is extracted from the microorganisms.
d. Other materials					
1	Mixed vegetable oils	-	-	It is a value added product	It is made by mixing two or more vegetable oils.

2	Javadhu	-	-	It is a value added product	Javadhu also known as javvadhu or javvathu is a traditional aromatic paste made from natural ingredients primarily botanical such as sandalwood, herbs spices and floral extracts.
3	Soaps	-	-	It is a value added product	Soaps are prepared by mixing two or more materials.
4	Shampoos	-	-	It is a value added product	Shampoos are prepared by mixing two or more materials.
5	Perfumes	-	-	It is a value added product	Perfumes are prepared by mixing two or more materials.
6	Cosmetics	-	-	It is a value added product	Cosmetics are prepared by mixing two or more materials.
7	Paint	-	-	It is a value added product	Paints are prepared by mixing two or more materials.
8	Varnish	-	-	It is a value added product	Varnish is prepared by mixing two or more materials.
9	Kombucha	-	-	It is a value added product	Kombucha is prepared by mixing two or more materials.
10	Polymethyl methacrylate acid	-	-	-	Synthetic source
11	Olefinic copolymer - cyclo olefin copolymer	-	-	-	Synthetic source
12	Polyacrylic acid	-	-	-	Synthetic source