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Documentation of non-timber forest products and medicinal plants available in Narayanpur forest area of Chhattisgarh

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Abstract
Documentation of non-timber forest products and medicinal plants available in Narayanpur forest area of Chhattisgarh. The study was carried out in two block namely Narayanpur block- Chhotedongar Benoor, Bharanda and Orchha block- Orchha, Gudadi, Basing site Narayanpur, district of Chhattisgarh. Forest and tribal's are mutually dependant on each other. Tribal's like to live in forest. The livelihood of tribes totally depends on forest in which NTFPs and agriculture are the main source of their income. The productions of agriculture crops were also low due to traditional cropping practice and lack of irrigation facilities. Most of the Tribal's now practice some sort of settled agriculture; only those living in interior hill ranges such as the Marias of Abujhmar still do shifting cultivation. The study reveals that the total 112 NTFPs species were documented belongs to 47 trees, 29 shrubs, 12 herbs 22 climber and 1 bamboo and 1 rattan species. A variety of NTFPs *viz*, seeds, leaves used for plate making, Tans and Dyes, Gum and Resin, Edible products, Oil yielding, Bamboo, Fibre, and Broom making, Medicinal plants and Biocides (fungicidal, insecticidal and nematicidal) were identified.

Keywords: NTFPs, medicinal plants, dyes, tans, gum, resin, biocides, tribes, shifting cultivation

Introduction
Non-timber forest products (NTFPs) are an integral part of development and survival of people living in and around forests and depending on them. The potential economic value of NTFPs either in terms of utilization or their market value is often underestimated or unknown. Non-timber Forest Products (NTFPs) are important tools for addressing poverty issues for the marginalized, forest dependent communities, by contributing to livelihoods, including food security, income, health and sustainable human development Globally, an estimate 350 million people mostly in developing countries depend on NTFPs as their primary source of income, food, nutrition, and medicine (UND, 2004; FAO, 2005). NTFPs are important roles in the socio-economy, culture and livelihoods of millions of forest dependent rural people by providing subsistence income, employment, energy, nutritious foods, fodder, housing materials, medicines and a wide range of goods and ecosystem services. The collection of Non-Timber Forest Products (NTFPs) like fuel wood, fodder, timber, lac, fibres, floss, medicines, vegetables, tubers, roots, leaves, fruits, bush meat, housing materials, etc. derived from forests are an integral part of day-to-day livelihood activities for tribal people.
Narayanpur is a tribal District of Chhattisgarh. This district comprises 412 villages. Narayanpur District has an area of 20.98 km².The District is surrounded by Kondagaon, Antagarh, Bijapur Districts of Chhattisgarh. District Narayanpur has population of 1,40,206 of which male and female were 70,189 and 58,379 respectively in census 2011. Of the total population more than 77 % are tribal people like Gond Tribe, Maria, Muria, Dhruva, Bhatra, Halba Tribe, etc. Narayanpur District is divided into two Blocks namely Narayanpur, Orchha and Two tahsils namely. The Land of Tribals and Natural Resources, is also enriched with natural beauty and pleasant atmosphere. It is surrounded with dense forests, hilly mountains, streams, waterfalls, natural caves etc. Here the art & culture are the valuable ancient properties of the Bastariyas.
Narayanpur district have dense forest and the found rich in Minor Forest Produces (NTFPs). Because of having these NTFPs, the district is contributing a major revenue income to the state.

The important NTFPs available in Narayanpur district are Chironji, Amchur, Vaybidang, Karanji, Marorphali, Mango Kernal, Tamarind, Kosa Cocoons, Peng Seeds, Korkoti Seeds, Nirmali Seeds, Ambadi, Amla, Charota Seeds, Chirayta, Mahua, Tora, Harra, Bamboo, Boda, Mashroom, Dhavai Phool, Bhelwa Seeds, Sal seed, Mahul (seed, leaf, Rope), Thikur, different type of tuber and medicinal plant and Cane (Beth) etc.

Materials and Methods

The study was carried out in two block namely Narayanpur block- Chhotedongar Benoor, Bharanda and Orchha block- Orchha, Gudadi, Basing site Narayanpur Forest Division in Narayanpur district of Chhattisgarh and data was collected on rainy, winter and summer season when the NTFPs are extracted from forests and sold in the market. The data was collected on the basis of questionnaire developed for this experiment regarding, processing of the harvested NTFP before storage and marketing of the produce. Out of total tribal families residing in each selected village, a representative sample of 20 per cent respondents were selected by purposive sampling. Conservation practices of tribal's was also observed and recorded during the study.

Results and Discussion

The villagers mainly depend on some NTFPs species for their livelihood and subsistence. Among all these Medicinal and NTFPs species enlisted and identified some are the source of their income such as *Madhuca latifolia* (Mhaua) flower, *Bauhinia vahlii* (Mahul) leaves, *Diospyros melanoxylon* (Tendu) leaves, *Celastrus paniculatus* (Peng), *Tamarindus indica* (Imli) fruit *Mangifera indica (*Mango*), Phoenix acaulis* (Chhind) and *Caryota urens* (Salfi) Juice *Thysanolaeana maxima* (Phul bahari) and *Dendrocalmus strictrus* Bamboo product. There are 112 NTFPs were identified and documented during present investigation. The identified 112 NTFPs species belongs to 47 trees, 29 shrubs, 12 herbs, 22 climbers, Bamboo 1 and Rattan (beth) 1 species. A variety of NTFPs *viz*. Seeds, leaves used for plate making, Tans and Dyes, Gum and Resin, edible products, Oil yielding, Bamboo, Fibre, Thatching, Broom making, Medicinal plants, Biocides (fungicidal, insecticidal and nematicidal) and *Salacia oblonga* and *Tamilnadia uliginosa* Fish poison were identified. Rajasekaran and Prasad (2005) conducted a survey to collect information on Medicinal plants sold in local market at Velliyangiri Hills, Boluvamputti Reserve Forest by the Irula Tribes. There are twenty-five medicinal plant species, which include 9 shrubs, 3 herbs, 3 epiphytes and 2 climbers.

The forest of the study area has abundant different NTFPs plants species, which are used by villagers for various purpose viz. Food, medicine, tans & dyes, oil, fuel, fodder, construction etc. Maximum NTFPs species are used for medicinal purpose. Among identified 112 plants species 108 species came under medicinal plant. Ahirwar (2015) reported that total 41 plants species belonging to 26 families and 37 plant genera were identified. A field survey was conducted at three different study sites in Boridand forest, district Korea, Chhattisgarh.

About 25 plant species was edible. About 8 Gum yielding plant species was identified.7 Plate, Broom and Rope making plant species was identified. 10 fire wood plant species was identified. 9 Biocides (fungicidal, insecticidal and nematicidal) plant species was identified. The *Madhuca latifolia* (Mhaua) *phoenix acaulis* (Chind) and *Caryota urens* (Salfi) used for beverage making and *Tamarindus indica* (Imli), *Mangifera indica* (Aam), *Asteraeus hygoromericus* (Boda) *termitomyses strictrus* (Mashroom) and *Dendrocalmus strictrus* (Bamboo product) are playing a significant role in the income of the people residing in study area. The Tans and Dyes yielding 21 plant species were identified. The oil yielding 2 tree species were identified. The 2 lac yielding plant species was identified. *Shorea robusta* (sal), Saja (*Terminalia tomentosa*) species as a host tree for Cocoon (Kosa) production in this study area. Similar study carried out by Islam & Quli (2016), Singh and Bharti (2015).

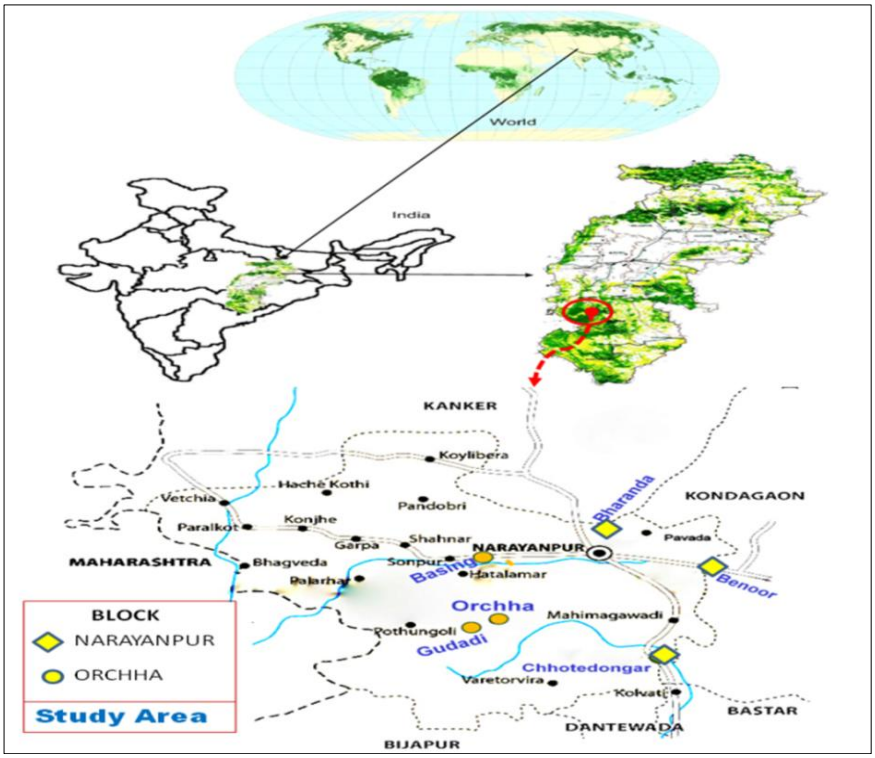

Plate 1: Location map of study area

Table 1: List the medicinal and NTFPs Species in study area of Narayanpur (C.G.)

S. no	Local Name	Botanical Name	Status	NTFPs Use	Medicinal Use	Other Use
1.	Bel	*Aegle marmelos*	Tree	Whole plant, bark, fruits, leaves, twigs and root.	Diarrhoea, dysentery, haemorrhoids aphrodisiac laxative, diuretic astringency and peptic ulcers.	Fruit rind is used in making perfumes and soap unripe seeds are used as adhesive and household glue.
2.	Haldu	*Adina cordifolia*	Tree	The bark contains 7 – 9% tannins. Root.	Antiseptic, febrifuge, kill worms in sores, Pain killer, diarrhoea and dysentery.	Pulp and paper it is also used for construction, window frames, furniture, bobbins, boxes, piano keys, rulers.
3.	Dhaura	*Anogeissus latifolia*	Tree	Leaves, bark, Gum (ghatti gum)	Treating snake bites and scorpion Stings.	Used in calico printing for sweetmeats, dye processes, and as a binding agent in pharmaceuticals and timber wood, tanning, gum used Food industry.
4.	Sheeta phal	*Annona squamosa*	Tree	Edible fruit, Leaves, shoots, bark and roots	Diarrhoea, ulcer, wound, dysentery, aid digestion, rheumatism, sleeplessness, cough, diabetes and hair tonic.	The tree is a good source of firewood, pesticide in agriculture and horticulture.
5.	Neem	*Azadirachta indica*	Tree	Seed and leaves	Heart problems, eczema, arthritis, white discharge, ear and tooth ache, malaria, anti-toxic, anti-microbial, tooth washing, furniture making, chicken pox, blood purification.	Timber wood. Seed and leaves used for Pest and disease control and cosmetics.
6.	Kachnar	*Bauhinia purpurea*	Tree	Root, leaves, flower, buds, gum, seeds and flower	Amoebic dysentery, diarrhoea and other stomach disorders, cuts and wounds, skin diseases, scrofula, ulcers, piles, dysentery, worms and dyspepsia.	The bark is a source of tannins. It is used for dyeing in various shades of brown. Wood used making household and agricultural implements. Fuel wood The calorific value is 4800 kcal/kg.
7.	Kasi	*Bridelia retusa*	Tree	Bark and fruit	Hypoglycaemic, hypertensive, cuts and wounds.	The bark contains 16-40% tannins. It's used for construction, railway ties and floorboards, wheel and agriculture implements, wood is used for fuel.
8.	Semal	*Bombax ceiba*	Tree	Flowers, floss, buds, leaves, bark, seeds, roots – raw or roasted Rich in starch Gum	Cholera, tuberculosis fistula, coughs, urinary complaints, nocturnal pollution, abdominal pain due to dysentery, impotency. The gum is astringent, demulcent and tonic. It dysentery, haemoptysis in pulmonary tuberculosis, influenza menorrhagia hypertensive and hypoglycaemic.	The seed is used as a stuffing material for pillows, cushions. It is considered to be vermin-proof. Waterproof and buoyant, it can be used as the filling in life jackets. It is sometimes also as an insulating material in refrigerators, packing material sound-proofing properties, fibre cordage, making ropes.
9.	Chironji	*Buchanania lanzan*	Tree	Seed, Gum and bark is used in tanning.	Gum for Leprosy. Roots for acrid, astringent, cooling, depurative, constipating and diarrhoea. Leaves for skin diseases and fruits for coughs and asthma.	Fire wood and charcoal.
10.	Palas	*Butea monosperma*	Tree	Young roots, rope	A powerful astringent, it is used in the treatment of diarrhoea and wounds. The seeds show anthelmintic, antifungal and antibacterial activities. The flowers are useful in the treatment of liver disorders The seeds act as an anthelmintic.	Dye, tannin, oil, sandals, ropes, charcoal, cordage, caulking the seams of boats and making paper.
11.	Amaltas	*Cassia fistula*	Tree	Flower, fruit, Bark, stem, root, Leaves and seed.	Malaria, blood poisoning, anthrax, diabetes and dysentery Ring worm, wound, fever, leprosy, cough.	Tanning and dyeing. Wood used for buildings, carts, fence posts, agricultural implements etc.
12.	Kumbhi	*Careya arborea*	Tree	Flower, fruit, bark, juice, seed and calyx.	Body swellings astringent, mucilaginous coughs and colds	Used for general construction (house posts, planking), furniture and cabinet work, carts, mouldings, turnery, piling and agricultural implements.
13.	Karra	*Cleistanthus collinus*	Tree	Fertilizer, fodder	The stem bark is chewed for its tonic properties.	Washing agent for clearing septic wound, cure fungal diseases. Fencing pole, timber. The wood is used to make household utensils and for temporary constructions.
14.	Dhobin	*Dalbergia paniculata*	Tree	The bark is astringent	The sweet blackish pulp of the seedpod is used as a mild laxative.	The heartwood is dull brown the sapwood pale brown with a grayish tinge. The wood is of moderate weight; fairly hard; strong; and durable. It takes a high polish with a satiny lustre. The wood is used in house construction.

15.	Karmota	*Dillenia indica*	Tree	Fruit are used raw or cooked. They can be used in curries or made into drinks, jellies and sherbet.	Bark is used as a mouthwash to treat thrush, Juice with sugar used as cooling beverage in fever and cough. Bark and leaves: Taken to cure diarrhoea and dysentery.	Soap, hair wash. Scalp to prevent baldness, house-building or gunstocks polish ivory.
16.	Tendu	*Diospyros melanoxylon*	Tree	Fruits, leaves. Fuel wood the calorific value of the sapwood is 4957 kcal/kg and of the heartwood, 5030 kcal/kg.	Mental disorders, diarrhoea, nervous breakdowns palpitations of the heart, astringent effect urinary, and skin and blood diseases.	The leaves are used as the wrapping around tobacco to make bidi cigarettes in India. Wood used for building, shoulder poles, mine props and shafts of carriages.
17.	Amala	*Emblica officinalis*	Tree	Fruit, Bark and leaf for Tannin. Leaves may yield 22 – 28% tannin.	Eye problems, joint pain, diarrhoea and dysentery, diabetics. The sour fruits are one of the ingredients of 'Triphala'.	Commonly used to make jams, jellies, tarts, chutneys etc.
18.	Gular	*Ficus glomerata*	Tree	Fruit, Bark and leaf, latex, edible fruit	Fever, reduces inflammations, pain, Swelling, Mouth ulcers, mouth infections, Boils, Pimples, freckles, Burn marks on skin, haematuria, menorrhagia, and haemoptysis.	Pickled, food, leaves are eaten as vegetable, The powder from roasted fruits forms a valuable breakfast food, remedy for dyes entry, tannin, latex, minor construction, cheap furniture, packing cases, mouldings, laundry tubs, fruit crates etc.
19.	Tado	*Ficus semicordata*	Tree	Used for food	Fevers, menstrual disorders, gastric troubles peptic ulcer sand fevers.	The bark yields a fibre used in making ropes.
20.	Pipal	*Ficus religiosa*	Tree	Leaf, bark, edible fruit, root	Skin diseases, rheumatism, ulcers, and scabies, healing of wounds, improve fertility and treat poisoning.	Latex and Tannins, transporting box and packaging.
21.	Bad	*Ficus benghalensis*	Tree	Leaf, root, and latex	Dysentery, sores, boils diuretic, epilepsy, fever, head ache, hydrocele, kidney disease, leucorrhoea.	Tannins, temporary binding materials, latex, cart yokes, furniture and to line wells.
22.	Kakai	*Flacourtia indica*	Tree	Bark, leaves and root.	Asthma, pain relief, gynaecological complaints worms, anthelmintic, hydrocele, pneumonia, and snake bites, gargle for hoarseness.	Agricultural implements such as ploughs, posts, building poles, rough beams, walking sticks and the manufacture of turnery articles. Wood used for fuel and for making charcoal.
23.	Kekar	*Garuga pinnata*	Tree	The fruits are eaten raw or pickled.	Stomachic, expectorant, astringent and antiasthmatic.	The tree is used as a support for growing pepper plants (*Piper nigrum*). There bark is a source of tannins. Used for the manufacture of furniture
24.	Kuru	*Gardenia latifolia*	Tree	Fruit, bark, flower	Teeth treatment, coetaneous diseases flies, worms, plant fever, epilepsy, pimples, tubercular fistula, ringworm, cholera, pleura smallpox, dysentery, neuralgia, snake bite and microbial infections.	Hedge and windbreak.
25.	Gamhar	*Gmelina arborea*	Tree	Flower, root.	Fruit and bark used against bilious fever roots as a blood purifier, laxative, stomachic, tonic and as an antidote to poison and, leaf: gonorrhoea and cough, and is also applied to wounds and ulcers.	Dye and manufacture of furniture, plywood core stock, mine props, matches and timber for light construction, canoes, musical instruments, for carving images . The flowers are mixed with rice to make a delicious cake-like festive dish that is eaten on the traditional.
26.	Dhaman	*Grewia tiliifolia*	Tree	Edible fruits The bark yields fibre cordage.	This tree is used in treating non healing wounds, ulcerative colitis, menorrhagia, cough etc.	It used for the wood is close-grained, hard. Shafts, shoulder poles, masts, golf clubs, tool handles, oars and all purposes for which elasticity, strength and toughness are required, twigs are lopped for fodder.
27.	Chhena	*Lagerstroemia parviflora*	Tree	Bark and gum. Black dye.	-	Wood used for making furniture, interior joinery, boat building, general construction, parquet flooring and panelling.
28.	Moyan	*Lannea coromandelica*	Tree	Bark and leaves.	Bruises, Bursitis, heart disease, Muscle Sprains, neuralgia, analgesic, anti-inflammatory.	Wood used for spear shafts, scabbards, wheel-spokes, oil presses, grain pounders etc. Gum used for calico

						printing. A soluble resin, called 'Jingan gum' is obtained from the stems.
29.	Maida	*Litsea glutinosa*	Tree	Whole plant	Fever, reduce swelling, and treat diarrhoea, dysentery, boils.	Candles, soap bark, wood contain gluten and may be used as binders, rope, furniture, plywood paper and pulp.
30.	Mahua	*Madhuca indica*	Tree	Flower and Whole plant	Anti-bacterial, carpentry work, pain killer, wine/liquor, worship.	Timber
31.	Mundi	*Mitragyna parvifolia*	Tree	Bark and root	Fresh leaf juice used to treat jaundice bark and roots used for fevers colic, muscular pains, stomach burning, poisoning, gynaecological problems, cough and oedema.	A useful wood, esteemed for many purposes, it is used in construction, furniture making, agricultural implements, combs, cups, spoons, plates and for turned and carved articles.
32.	Son padar	*Oroxylon indicum*	Tree	Pod, seed, bark	Blood purifier stomach complaints, diarrhoea and dysentery, fever, cough, diarrhoea cancer.	Tanning and dyeing, making matches, fibres, pulping to make paper. The wood is used for fuel for poor quality.
33.	Bija sal	*Pterocarpus marsupium*	Tree	Leave and bark. The tree yield a red gum know as "kono"	The gum, which contains 75% kin tannic acid, has medicinal uses diarrhoea, vitiligo, eczema, psoriasis, obesity and diabetes. Skin Problems gum exudation is used against body pain. Exudation from the stem is used as tongue cleaner.	The wood is strong, tough, very hard, durable and fine-grained, takes a fine polish and seasons well. It is used for door and window frames, posts, agricultural implements, boat building, carts, railway carriages, railway ties.
34.	Girchi	*Salacia oblonga*	Tree	Bark of the tree.	Improves blood sugar, Protects heart, Liver protective, Inhibits weight gain, Kidney tonic.	-
35.	Kosum	*Schleichera oleosa*	Tree	Seed, Bark and lac.	Wounds and ulcers of cattle. Leprotic ruptures, ulcers, skin inflammations and malaria.	House construction, ship building and musical instruments.
36.	Paral	*Stereospermum colais*	Tree	Root bark, flower, seed, leaf, kshara.	Otalgia, odantalgia, rheumatalgia, malarial fever, wounds, chronic dyspepsia, asthma and cough.	Furniture, construction, tea boxes, canoes, fuel, charcoal.
37.	Nirmali	*Strychnos potatorum*	Tree	Leaf, fruit, root	Epilepsy, cough, liver, kidneys, stomach gonorrhoea, leucorrhoea, bronchitis, chronic diarrhoea, kidney, bladder stones, diabetes and eye diseases.	Clearing water, termite resistant, carts, shafts, agricultural implements, tool handles. Water clearing purpose.
38.	Bhelwa	*Semecarpus anacardium*	Tree	Seed, fruit, gum and oil.	Aphrodisiac, digestive, stimulant, bronchitis, dysentery, fever, asthma, haemorrhoids, astringent, sterility in women, headaches, skin diseases and scabies.	Floor dressing as addictive substances to lacquers, dyes and insulating material in the plastics industry for regenerating rubber materials and to protect wood from white ants.
39.	Sal	*Shorea robusta*	Tree	Seed, Gum, Resin and Tannin	Treatment of dysentery, gonorrhoea, boils and toothaches.	The leaves are widely used for making plates, cups and for wrapping.
40.	Amra	*Spondias mangifera*	Tree	Fruit, bark	It is used in the treatment of bilious dyspepsia. Treatment of stomach aches and dysentery. A paste of the bark is applied topically in the treatment of rheumatism and swollen joints.	Packing cases, floats, matches, non-ornamental plywood, canoes, pulp, interior finishing, drawers, match boxes, boxes, crates, carvings, fuel chutneys, stews, pickles and jams.
41.	Jamun	*Syzygium cumini*	Tree	Leaves fruits and bark.	Ailments, cough, diabetes, dysentery, inflammation and ringworm.	Timber wood, as a plank well.
42.	Kalikakri	*Tamilnadia uliginosa*	Tree	Fruits, root, pulp.	Used as astringent, cholera, diarrhoea, eye complaints, dysentery, headache, cooling.	The unripe fruit is employed as fish poison and tree are used in ornamentally.
43.	Imli	*Tamarindus indica*	Tree	Flower, fruit, root, bark, stem, seed and leaves.	Sores, ulcers, boils, rashes, asthma, cardiac, blood sugar, cough, fever, Inflammations, swelling, relieve pain, malaria and intestinal worms.	Sizing textiles, paints varnishes tannins can be used in ink or for fixing dyes. Carpentry, sugar mills, wheels, hubs, wooden utensils, agricultural tools, mortars, boat planks, toys, panels and furniture.
44.	Behara	*Terminalia bellirica*	Tree	Bark, fruit, seed, whole plant.	Ascaris, gray hair, hoarseness, weak eyesight, anaemia, asthma, piles, leprosy, liver disease, diarrhoea, hair fall and dyspepsia.	Natural dyes.
45.	Harra	*Terminalia chebula*	Tree	Seed, fruit and bark.	Bronchitis, cold, constipation, diuretic, eczema, dysentery, measles,	Tannins, construction timber, dyes, ink, furniture, carts implements and it is

					sore, pneumonia, stomach and spleen problem abnormal uterine bleeding coughs worms and asthma. Main ingredient of triphla.	used for various preparation.
46.	Saja	*Terminalia tomentosa*	Tree	Bark and Gum.	Blood disorder, Burns, dandruff, anti oxidant, antiseptic, astringent.	Source tree for Cocoon (Kosa) production.
47.	Sagon	*Tectona grandis*	Tree	Whole plant	Burning sensation, arthritis, kidney, skin disease, diabetes and ulcer.	Timber wood.

Shrubs

S. No.	Local Name	Botanical Name	Status	NTFPs Use	Medicinal Use	Other Use
1.	Jungali bhindi	*Abelmoschus moschatus*	Shrubs	Seed, Bark, leaves.	Diuretic, demulcent, antiseptic, anti-spasmodic, cramp cooling, tonic, carminative, aching joints, aphrodisiac, antispasmodic digestive system, feverish patient, and poor circulation.	Pesticide, food, luxury aromatic, cosmetic products, sweets, alcoholic and non-alcoholic beverage, aroma. Oil obtained from seeds contains 18.9% linoleic acid. Oil is of high economic value. Bark is used for make ropes and sails. Leaves are sometimes used as wrappers for parcels.
2.	Kangi	*Abutilon indicum*	Shrubs	Bark, seed, leaves.	Demulcent, diuretic, treat fever, colic, cleaning wounds, ulcers haemorrhoids and cooling remedy for coughs and fevers.	Making cordage, twine and rope, whilst that from younger stems can be woven into fabrics, dyes readily the stems are easy to ret.
3.	Rohani	*Acacia pennata*	Shrubs	Bark, leaves, roots	Asthma, Bronchitis Snake bite, Indigestion, Flatulence, Digestive disorder, antiseptic for scalding of urine and for curing bleeding gums. Leaf use in cholera treatment.	The bark contains tannin 9%, lupeol and alpha-spinasterol. Stem yields sitosterol.
4.	Sidha	*Albizia amara*	Shrubs	Leaves, fruits and root.	Malaria, coughs, infusion is drunk to treat pneumonia, tuberculosis, infertility of women and as an aphrodisiac, oedema, uterus, diarrhoea complaints, wounds, jaundice and mouth inflammation.	Soil binder, deterring soil erosion roots, washing hair, Tannins, furniture making, agricultural implements, construction, firewood and charcoal.
5	Amti	*Antidesma diandrum*	Shrubs	Leave and fruits	Dropsy, dysentery, bile complaints muscular pains, pneumonia, sores and the bites of rapid.	The wood is used for construction of ships, vehicles, posts agricultural tools and vegetable or curries, food.
6.	Satawar	*Asparagus racemosus*	Shrubs	Rhizome and shoot	Digestive, respiratory, female reproductive organs, diarrhoea, rheumatism, diabetes brain complaints, diuretic, antispasmodic, aphrodisiac, demulcent, galactagogue.	Root are used for washing clothes, Tender young shoots cooked as a vegetable.
7.	Salparni	*Desmodium gangeticum*	Shrubs	Root and leaves.	Stones, kidneys or bladder, headache, diuretic, toothache, oedema, swellings, chronic fever, coughs, biliousness, diarrhoea and dysentery.	Green manure, cover crop The fibrous stems are used for paper production.
8.	Lodara	*Desmodium pulchellm*	Shrubs	Bark and roots, red gum.	Antichloristic, diuretic, weight loss, haemorrhages, diarrhoea, cure eye diseases, rheumatic fevers; to cure toothache, dissolve internal blood clots.	A fibre are suitable for making rope, making agricultural implements, makes excellent furniture, is useful for carriage building and construction.
9.	Duling/ biabidang	*Embelia ribes*	Shrubs	Seed, leaves, bark	Cooling, diuretic and laxative, mouth wash to treat ulcers and sore throats, coughs and diarrhoea.	The crushed fresh bark is used to repel leeches.
10.	Kanputa	*Flemingia strobilifera*	Shrubs	Seed, roots leaves	Tuberculosis, bath after childbirth, epilepsy, contraceptive, induce sleep and to relieve pain.	The dried bracts are used for stuffing pillows and cushions.
11.	Kurru	*Gardenia resinifera*	Shrubs	Stem, buds and gum.	Cutaneous diseases, utaneous diseases and to keep off flies and worms.	The resin contains a bitter substance and essential oils Insecticide.
12.	Gudsukari	*Grewia 2649uberos*	Shrubs	Roots, fruits and leaves.	Tuberculosis, chronic respiratory diseases wasting of muscles, bleeding disorders like nasal bleeding, Ulcerative colitis, menorrhagia, urination, fever Dysentery, Suppurative	A good quality fibre is obtained from the bark. It is used for making ropes.

					constipation gastritis, aphrodisiac, heart disease, cough, wounds and dyspnoea, diarrhoea and dysentery.	
13.	Kankara,	*Ixora indica*	Shrubs	Roots, fruits and leaves.	Piles, diuretic, purgative, tonic, used in intestinal obstructions, intestinal disorders, dysentery, jaundice, headache, toothache, urinary diseases, itch and dropsy	Cosmetic, green mulch.
14.	Duddi	*Holarrhena pubescens*	Shrubs	Seed, leaves, bark and juice.	Diarrhoea oestrogens, progestrogens and androgens stimulate milk production, to treat constipation, asthma, abdominal pains and infertility, toothache, scabies, boils, ulcers and haemorrhoids	Dye, ash are used as a mordant, combs, picture frames, carved boxes, toys, spoons, knives, walking sticks, beads, furniture and ploughs and make paper.
15.	Kutaj	*Holarrhena antidysenterica*	Shrubs	Seed, leaves, bark and juice.	Holarrhena, antidysenterica, dropsy, skin disorders, psoriasis, nonspecific dermatitis fevers, diarrhoea dysentery and intestinal worms.	-
16.	Marorphali	*Helicteres isora*	Shrubs	Bark, root and fruit.	Cures dysentery, stomach pain, expectorant, demulcent, astringent, galactofuge, diarrhoea and a remedy for scabies.	Bark used as cordage for making cots, tying cattle and ploughs. Bark fibre is good for making ropes and clothing.
17.	Nilni	*Indigofera tinctoria*	Shrubs	Leaf flower are used for vegetable	Epilepsy, nervous disorders, asthma, bronchitis, fever, complaints of the stomach, liver, kidney, spleen, rabies prophylactic, skin diseases, wounds, sores, ulcers, haemorrhoids, worm-infested wounds, toothache, syphilis, gonorrhoea, kidney stones hair fall and grey hair problems.	Cover crop, green manure and dye
18.	Chameli	*Jasminum polyanthum*	Shrubs	Leaf, root, flower,	Ulcer, headache, mouth disease, impotency, skin disease, ear problem, worm and fever.	Oil cosmetic industry, perfume and soap.
19.	Banchalita	*Leea asiatica*	Shrubs	Root and leaves	Guinea worms and snake-bite.	A leaf extract is mixed with water and used for washing the hair.
20	Ramphool	*Lantana camara*	Shrubs	Seed, flower, fruit, bark and root,	Influenza, cough, mumps, incessant high fever, malaria, cervical lymph node tuberculosis, asthma, toothache, headache, inflammation, gonorrhoea and leucorrhoea. Dermatitis, eczema pruritus, measles and chickenpox rashes.	Biocides (fungicidal, insecticidal and nematicidal) firewood fencing, windrows, woodlots or natural bush. Erosion control, hedge, mulch material, produce pulp for paper suitable for writing and printing, firewood
21.	Harsigar	*Nyctantches arbor – tristis*	Shrubs	Flowers is used for colouring food.	Provoke menstruation; cholagogue, laxative, diaphoretic and diuretic, skin diseases, cough, ringworm, pain fever and hair fall.	Hedges, dyeing silk, tanning, polishing wood and ivory oil perfume.
22.	Harduli / lal kosum	*Olax scandens*	Shrubs	Leaf, bark and fruit	Anaemia, diabetes; fever, Ring worms.	-
23.	Chind	*Phoenix acaulis Phoenix sylvestris*	Shrubs	Leaves, fruit and juice.	Abdominal complaints, fevers, vomiting, loss of consciousness toothache, gonorrhoea, respiratory diseases fevers, diarrhoea.	The leaves are used to make mats, ropes, bags umbrellas, fences as well as for thatching roofs. The juice, drunk, obtained from the tree is considered to be a cooling beverage. The stems are used in making local house roofs and walls of huts, fencing and fuel.
24.	Menphal	*Randia dumetorum*	Shrubs	Fruit, seeds and Roots,	Malaria, dysentery, stop bleeding, fever cough, skin diseases, ulcers, asthma, flatulence, pain of bruises, colic, abortion, inflammation reducing abortifacient and rheumatism.	Latex, blue dye, ink, fuel wood calico –printing, and dyeing as a colour intensifier.
25.	Gotia	*Ziziphus xyloppyra*	Shrubs	Fruit, bark, seed and root.	Diabetes, diarrhoea, digestive, urinary disorders, abscess, acne.	Suitable for the production of veneer and plywood.
26.	Dhawaiphul	*Woodfordia fruticosa*	Shrubs	Flower	Dysentery, menorrhagia, Heart diseases wounds fever, ulcers, acne, digestive disorders, blood impurity, gout, skin diseases.	Tannins and dye.

27.	Katakuli	*Ziziphus rugosa*	Shrubs	Whole plant	Menorrhagia, hypertensive, after-birth pains, stomach-ache, snakebite, abortion, pneumonia.	Hedges, dye, fuel, charcoal, furniture, interior work, carving, building poles and tool handles.
28.	Makoy	*Ziziphus oenoplia*	Shrubs	Whole plant	Anthelmintic, digestive, antiseptic, hyperacidity, ascaris infection, stomachalgia and healing of wounds.	Fuel wood and tannin
29.	Ber	*Ziziphus mauritiana*	Shrubs	Leaves, fruits and bark.	Indigestion, Diabetes, diarrhoea, urinary disorders.	Construction, furniture, cabinet work, tool handles, agricultural implements, tent pegs, golf clubs, gun stocks, sandals, yokes, harrows, toys, turnery, household utensils, bowling pins, baseball bats, chisels, packaging, veneer and plywood.

Herbs

S. no.	Local Name	Botanical Name	Status	NTFPs Use	Medicinal Use	Other Use
1.	Phul ghangi	*Abutilon indicum*	Herbs	Leaves, seed, root, flower	Demulcent, diuretic, colic, for cleaning wounds, ulcers, haemorrhoids, leprosy and cough,	Fibre making cordage, twine, rope and whilst.
2.	Chirchita	*Achyranthes aspera*	Herbs	Root, seed, leaf, whole plant	Diuretic, antispasmodic, dropsy, rheumatism, stomach problems, cholera, skin diseases, rabies, scorpion stings, diarrhoea, dysentery, pyorrhoea and toothache, nervous disorders, hysteria, insect and snake bites	Tooth powder, washing clothes and toothbrushes
3.	Mahkuwa	*Ageratum conyzoides*	Herbs	Leaf and flower	Constipation, infective hepatitis, eczema, epilepsy, fresh wounds, dizziness, diarrhoea, dysentery, sore eyes, fever, headaches, intestinal worms, 2651uberose is, vomiting and nausea, wounds and cuts, coughs and colds	The leaves and the flowers yield 0.2% essential oil with a powerful nauseating odour. A decoction of the fresh plant is used as a hair wash, leaving the hair soft, fragrant and dandruff free.
4.	Kalmegh	*Andrographis paniculata*	Herbs	Whole plants	Joint pain, jaundice, head ache, malaria, anti-helm, antic fever, itching skin eruption, (HIV), snake bites, stomach-ache, dysentery, typhus, cholera, influenza and bronchitis, diuretic, female disorders, dyspepsia, hypertension, rheumatism, gonorrhoea, amenorrhoea, torpid liver and jaundice.	Insecticide.
5.	Satawar	*Asparagus racemosus*	Herbs	Whole plant	Piles, fever, wound, anti-toxic, weakness, cough, Diarrhoea, headache, asthma, urinary disorder.	The squeezed root is used for washing clothes.
6.	Mahul	*Bauhinia vahlii*	Climber	Leaves, stem, and seed.	Demulcent and mucilaginous tonic and aphrodisiac.	Ropes, stems are used for matting, basketry and wickerwork. Leaves used as plates, cups, rough tablecloths, umbrellas, cloaks, and rain capes.
7.	Palasbel	*Butea 2651ubero*	Climber	Leaf, root, stem.	A gum obtained from the bark is astringent.	Tannin, kino gum, fibre.
8.	Dhanwanti	*Cissampelos pareira*	Climber	Leaf and root	diarrhoea, dysentery, ulcers, colic, intestinal worms and digestive complaints, urogenital problems, menstrual problems, venereal diseases, infertility, uterine bleeding, threatening miscarriage, stomachic, cough, heart trouble, rheumatism, jaundice, snake bites and skin infections sores, boils, scabies and childhood eczema.	A thin rope can be made from the rhizomes.
9.	Charota	*Cassia tora*		Seed and leaves	Ringworm and skin diseases rid the body of parasites, vomiting and stomach-ache, skin infections, sores, ulcers, insect bites and eye complaints.	*Cassia tora* tea is an herbal, pure, natural and non-polluted green health beverage (coffee-tea), substitute for coffee and sodas. Natural pesticide.
10.	Jugali kulthi	*Cajanus scarabaeoides*	Climber	Leafs and	Diarrhoea in cattle, diabetes, sore throats,	Green manure, fodder,

				seed	excessive production of urine.	food.
11.	Nagbel	*Cryptolepis buchanani*		Roots, bark, stems and leaves	Bone fracture, Blood-purifier, alterative, paralysis	Roof
12.	Bodal	*Cucumis melo agrestis*	Climber	Seed, flower, root and fruit.	Expectorant and emetic burns and abrasions antitussive, digestive, febrifuge and vermifuge.	-
13.	Kali musli	*Curculigo orchioides*	Herbs	Root, juice.	Dysentery, peptic ulcers, piles, gonorrhoea, leucorrhoea, asthma, jaundice, chronic nephritis, diarrhoea, lumbago and headache.	-
14.	Tikur	*Curcuma angustifolia*	Herbs	Rhizome.	Demulcent and dislocated bones, chronic diseases, fevers, breast-milk, urinary apparatus, acidity, bronchitis and soothe coughs, asthma, ulcers.	Tikhur barfi and cooling squash.
15.	Genji	*Curcuma zedoaria*	Herbs	Rhizome	Indigestion, nausea, flatulence, bloating, anti-cancer properties, cervical cancer, bad breath. Rhizome is used to clean, cure ulcers, wounds and other skin disorders.	An essential oil obtained from the rhizome is used in perfumery.
16.	Safed musli	*Chlorophytum tuberosum*	Herbs	Root.	Tuberculosis, male impotency and tonic.	-
17.	Peng	*Celastrus paniculatus*	Climber	Seed, root, leaves, stem, bark, wood and fruit.	Mental disorders and ophthalmic, anaemia, abortifacient, backache, gout, headache, paralysis, stomach-ache, wounds, swollen veins, rheumatism, leprosy, diarrhoea, bone fracture, bronchitis, cold, cough, body ache, eczema, fever, digestive complaints.	The seed contains 52% oil, and the fruit 30%. It is used as an illuminate in lamps and also for soap making.
18.	Kewkanda	*Costus igneus*	Climber	Leaves And rhizome	Diuretic, colds with a fever, Diabetes, asthma, bronchitis skin disease,	Chutney and ornamental uses.
19.	Kosakanda	*Dioscorea esculenta*	climber	Tuber	Dyspepsia, swelling, ulcers, menopause, beriberi, Rheumatism.	Use as a vegetable.
20	Karukanda	*Dioscorea bulbifera*	Climber	Leaves, tuber and roots.	Fever, diarrhoea, haemorrhoids, purulent, ophthalmic, and for snake-bite.	Use as a vegetable.
21.	Kargaya kanda	*Dioscorea 2652uberose*	Climber	Lives, tuber,	Spleen –stomach, loss of appetite, body fatigue, diarrhoea, kidney, cough, blood sugar, stomach pain, arthralgia, amenorrhea.	Edible
22.	Baichandi	*Dioscorea hispida*	Climber	Tuber	Diabetes.	The chips of Baichandi are eaten during fast. Its nutritious chips.
23.	Jangali Kundaru	*Diplocylus palmatus*	Climber	Whole plant	Stomach-ache, expectorant, laxative, vitiated vata, pitta, inflammation, cough, flatulence, skin diseases and general debility.	-
24.	Jungali tambakhu	*Elephantopus scaber*	Herbs	Roots and leaves	Anthelmintic, diaphoretic, diuretic, emmenagogue, emollient, febrifuge, Asthma, coughs and pulmonary diseases; dyspepsia, diarrhoea and dysentery; oedema; urethral discharges, venereal diseases, fungal skin diseases malaria, tonic during parturition, tooth-ache.	Young leaves – cooked and eaten like spinach. A powder made from the plant is added to ‘marcha’, a fermentation cake used in the preparation of local alcoholic drinks.
25.	Kalihari	*Gloriosa superb*	Climber	Leaves, seed, tuber.	Ulcers, leprosy, piles, inflammations, abdominal pains, itching, thirst, bruises, colic, haemorrhoids, cancer, arthritic conditions, swellings of the joints, sprains, dislocations, smallpox, leprosy, eczema, itch, and ringworm. Gums used to treat painful teeth.	Colchicines, obtained from all parts of the plant but particularly the seeds, inhibits cell division and is used in plant breeding to produce polyploidy. Strong nematicidal.
26.	Anant mul	*Hemidesmus indicus*	Climber	Roots.	Blood purifier, demulcent, diaphoretic, diuretic, appetite loss, dyspepsia, fever, skin diseases, syphilis, leucorrhoea, genitourinary diseases, chronic coughs and tonic.	The fibrous bark is used to make rope
27.	Kali dudhi	*Ichnocarpus frutescens*	Climber	Root, leaves, woody part	Diuretic, fevers, headaches, wounds, dental caries, scabies rheumatism, asthma, cholera, and fever.	The fibrous bark is used to make rope.
28.	Koroti	*Ipomea nil*	Climber	Leaves, seed,	Oedema, oliguria, ascariasis, constipation, contraceptive, mental disorders, rid of lice.	-
29.	Khekhshi	*Momordica dioica*	Climber	Shoots,	Bleeding piles and urinary complaints,	Vegetable.

				leaves, fruit and tuber.	fever, asthma, leprosy, excessive salivation, prevent the inflammation lizard, snake bite, elephantiasis, fever, mental disorders, digestive disorders, heart treatment, pimples and acne.	
30.	Bankumra	*Pueraria 2653uberose*	Climber	Tuber	Reproductive tonic, menstrual disorders, menopause syndrome and uterus weakness, abortion. Aphrodisiac and improves sperms in males, fevers and swellings.	-
31.	Ramdatun	*Smilax macrophylla*	Climber	Root	Dental abscesses, oedema, gingivitis, urinary tract infection. Sexually transmitted diseases.	Rope.
32.	Chikti	*Triumfetta rhomboidea*	Shrubs	Flower, fruit, root, bark, and leaves.	Internal ulcerations, gonorrhoea, antihypertensive, astringent, diuretic, mucilaginous, emollient, diarrhoea, dysentery, internal haemorrhages, and leprosy.	A soft, glossy fibre is obtained from the bark. The fibre is rather similar to Jute (*Corchorus* spp).
33.	Jangali angur	*Vitis tiliifolia*	Climber	Fruit, stem,	The water obtained from the stem is reputed diuretic and efficacious as a remedy for venereal diseases.	The tough stems are used for temporary cordage in gathering firewood and for other purposes, grown as a forest crop in Mayan agriculture, and is used for food or drink
34.	Pitai / lal bel	*Ventilago madaraspatnam*	Climber	Root, bark, seed,	Itch, coetaneous eruptions.	Seed are used for oil extract.
35.	Beth/Rattan	*Calamus spp.*	Shrubs	Root, rhizome, stem(cane), fruit	Cancer, debility, snake bite, itching, spleen diseases, leprosy.	The canes are used either in whole or round form, especially for furniture frames, or split, peeled or cored for matting, fish traps and basketry.

Conclusion

Among all these Medicinal and NTFPs species enlisted and identified some are the source of their income such as *Madhuca latifolia* (Mhaua) flower, *Bauhinia vahlii* (Mahul) leaves, *Diospyros melanoxylon* (Tendu) leaves. There are 112 NTFPs were identified and documented during present investigation. The identified 112 NTFPs species belongs to 47 trees, 29 shrubs, 12 herbs and 22 climbers and 1 bamboo and cane species. A variety of NTFPs viz. seeds, leaves used for plate making, Tans and Dyes, Gum and Resin, edible products, Oil yielding, Bamboo, Fibre, Thatching, Broom making, Medicinal plants and Biocides (fungicidal, insecticidal and nematicidal). The forest of the study area has abundant different NTFPs plants species, which are used by villagers for various purpose viz. foods, medicine, tans & dyes, oil, fuel, fodder, construction etc. The livelihood of the tribes is totally depending on the NTFP and medicinal plants available of the forest area. Due to middleman involvement in this trade the collectors are cheated badly and middlemen and traders profit for different NTFP they get 200-500% income. There is need that the govt. must declare the Minimum support prize for different commercially important Medicinal plants and other NTFP.

Plate 2: Medicinal plant Species of the study area

Plate 3: Medicinal plant Species of the study area

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