NON-TIMBER FOREST PRODUCTS (NTFPs) INVENTORY AND SUSTAINABLE HARVESTING PLAN FOR ACA, 2025-2029

NATIONAL TRUST FOR NATURE CONSERVATION

Annapurna Conservation Area Project

Headquarters, Pokhara,

2024

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Warm Regards,

……..

(Babu Lal Tiruwa)
Sr. CO/Theme Coordinator
NTFPs ISHP Study Team
2024

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ACCRONYMS AND ABBREVIATIONS

ACA	Annapurna Conservation Area
ACAP	Annapurna Conservation Area Project
BK	Bark
CA	Conservation Area
CAMC	Conservation Area Management Committee
CBD	Convention on Biological Diversity
CITES	Convention on International Trade in Endangered Species of Flora and Fauna
FGDs	Focus Group Discussions
FI	Fower
GDP	Gross Domestic Product
GIS	Geographical Information System
GoN	Government of Nepal
GPS	Geographical Positioning System
HDI	Human Development Index
HH	Household
IVI	Important Value Index
KIIs	Key Informant Interviews
km	Kilometer
LRP	Local Resource Person
M	Meter
Lf	Leaf
MAPs	Medicinal and Aromatic Plants
MoFSC	Ministry of Forest and Soil Conservation
NRCA	National Resource Conservation Assistant
NTFPs	Non-Timber Forest Products
NTNC	National Trust for Nature Conservation
OIC	Office In-Charge
PA	Protected Area
PRA	Participatory Rural Appraisal

PV	Prominence Value
R	Radius
RD	Relative Density
RDo	Relative Dominance
RF	Relative Frequency
RM	Rural Municipality
RRA	Rapid Rural Appraisal
UCOs	Unit Conservation offices

GLOSSARY

Abaxial. The side of an organ away from the axis or center of the axis; dorsal.

Achene (akene). A small dry indehiscent one seeded fruit with tight thin pericarp.

Acicular. Needle-shaped.

Actinomorphic. Regular, Symmetrical.

Acuminate. Sald of an acute apex whose sides are somewhat concave and taper to a protracted point.

Acute. Sharp, ending in a point, side of the tapered apex essentially straight or slightly convex.

Adaxial. A condition existing when two dissimilar organs or parts touch each other convinently but are grown or fused together. See coherent and adnate.

Aestivation. The arrangement of the perianth or its parts in the bud. Venation is leaf arrangement in the bud.

Aggregate fruit. One formed by the coherence of pistils that were distinct in the flower, as blackberry (Rubus).

Alternate. Any arrangement of leaves or other parts not opposite or whorled; place singly at different heights on the axis or stem.

Annular. In a ring or arranged in a circle.

Anterior. Front; on the front side; away from the axis; towards the subtending bract.

Anther. The pollen-bearing part of stamen, borne at the top of filament or the filament sometimes sessile. See pollen sac.

Apetalous. Without petals; petals missing.

Apex (pl. Apices). The tip or distal end.

Appressed. Closely and flatly pressed against; adpressed.

Arachnoid. Cobwebby by soft and slender entangled hairs; also, spiderlike.

Armed. Provided with any kind of strong or sharp defense, as of thorns, spines, prickles, barbs.

Articulate. Joined; provided with nodes or joints or places where separation naturally take place.

Ascending. Rising up; produced somewhat obliquely or indirectly upward.

Auricle. An ear shaped part or appendage, as the projections at the base of some leaves and petals.

Awl-shaped. Narrow and sharp-pointed; gradually tapering from base to slender or stiff point.

Axillary. In an axil.

Axis. The main or central line of development of any plant or organ; the main stem.

Basifixed. Attached or fixed by the base as an ovule or another that is affixed to its support by its bottom rather by its side.

Basipetal. Developing in a longitudinal plane from an apical or distal point toward the base the opposite of acropetal. See Centrifugal.

Beak. A long, prominent and substantial point; applied particularly to prolongation of fruits and pistils.

Beard. A long awn or bristle-like hair, as in some grasses; tuft, line or zone of pubescence as in some corollas.

Berry. Pulpy, indehiscent, few or many seeded fruits; technically, the pulpy fruit resulting from a single pistil, containing one or more seeds but no true stone as the tomato or grape.

Biennial. Of two seasons duration from seed to maturity and death.

Biseriate. In two whorls or cycles, as a perianth comprised of calyx and a corolla.

Bisexual. Having both sexes present and functional in the one flower.

Blade. The expanded part of leaf or petal.

Bract. A much-reduced leaf, particularly the small or scale like leaves in a flower cluster or associated with the flowers; morphologically a foliar organ.

Bracteate. Bearing bracts.

Bristly. Bearing stiff strong hairs or bristles.

Bulb. A thickened part in a resting state and made up of scales or plates on a much-shortened axis.

Bulbil. A bulb arising, usually in leaf axils or sinuses.

Bush. A low and thick shrub, without distinct trunk.

Caducous. Falling off early or prematurity, as the sepal in some plants.

Calyx. The outer whorl of floral envelopes composed of the sepals; the latter may be distinct or connate in a single structure, sometimes petaloid as in some ranunculaceous flowers.

Capillary. Hair like; very slender.

Capsule. A dry fruit resulting from the maturing of a compound ovary, usually at maturity by one or more lines of dehiscence. Types: loculicidal, poricidal and septicidal.

Catkin. A scaly-bracted, usually flexuous spike or spike like inflorescence of cymules; ament; prominent in willows, birches, oaks.

Cauline. Pertaining or belonging to an obvious stem or axis, as opposed to basal or rosulate.

Ciliate. Fringed with hairs; bearing hairs on the margin.

Clasping. Partly or wholly surrounding stem.

Claw. The long narrow petiole-like base of the petals or sepals in some flowers.

Column. Body formed of union of stamens, style and stigmas in orchids, or of stamens, as in mallows.

Compound leaf. A leaf of 2 or more leaflets.

Compressed. Flattened, especially flattened laterally. See uncompressed.

Cone. A dense and usually elongated collection of flowers or fruits comprising usually sporophylls and bracts on a central axis, the whole forming a detachable homogeneous fruit like body; some cones are of short duration, as the staminate cones of pines, and other became dry and woody persistent parts.

Contiguous. Touching without fusion; used irrespective of whether the parts are like or unlike.

Cordate. Heart-shaped; with a sinus and rounded lobes at the base, and ovate in general outline; often restricted to the basal portion rather than to the outline of the entire organ.

Coriaceous. Leathery texture, as a leaf of Buxus.

Corolla. Inner circle or second whorl of floral envelopes; if the parts are separate, they are petals and the corolla is said to be polypetalous; if not separate, they are teeth, lobes, divisions or are undifferentiated, and the corolla is said to be gamopetalous or sympetalous.

Cotyledon. Seed leaf; the primary leaf or leaves in the embryo; in some plants the cotyledon always remains in the seed coats and in other (as bean) it emerges on germination.

Creeper. A trailing shoot that takes root mostly throughout its length; sometimes applied to a tight-clinging value.

Crested. With elevated and irregular or toothed ridge.

Crown. Corona; also, that part of the stem at the surface of the ground; also, a part of a rhizome with a large bud, suitable for use in propagation.

Cryptogam. A plant reproducing by spores instead of by seeds, as ferns, mosses, algae.

Cyclic. Whorled, the opposite of spiraled.

Cyme. A broad, more or less flat-topped, determinate flower cluster, with central flowers opening first.

Deciduous. Falling at the end of one season of growth or life, as the leaves of non-evergreen trees.

Denticulate. Minutely or finely dentate.

Diffuse. Loosely branching or spreading; of open growth.

Dioecious. Having staminate and pistillate flowers on different plants; a term properly applied to a taxonomic unit, not to flowers.

Diurnal. Opening only during hours of daylight.

Dorsal. Back; relating to the back or outer surface of a part or organ, as the lower side of a leaf; the opposite of ventral.

Drupe. A fleshy one-seeded indehiscent fruit with seed enclosed in a stony endocarp (a pyrene); stone fruit.

Drupelet. One drupe of a fruit composed of aggregate drupes, as in the raspberry, the so-called seed being a pyrene.

Ebracteate. Without bracts.

Eceliate. Without cilia.

Endocarp. The inner layer of pericarp or fruit wall.

Entire. Without a continuous margin; not in any way indented; whole (may or may not be hairy or ciliate).

Epiphyte. A plant growing on another or on some other elevated support.

Evergreen. Remaining green in its dormant season; sometimes applied to plants that are green throughout the year; properly applied to plants and not to leaves, but due to the persistence of leaves.

Famine. Pistillate (in higher plants).

Fertile. Said of pollen-bearing stamens and seed-bearing fruits.

Fertilization. The union of two gametes resulting in a zygote.

Flexuous. Having a more or less zigzag or wavy form: said of stems of various kinds; withy.

Flower. An axis bearing one or more pistil or one or more stamens or both.

Foliaceous. Leaf-like; said particularly of sepals and calyx lobes and of bracts that in texture, size or color like small or large leaves.

Frond. Leaf of fern; sometimes used in the sense of foliage; especially of palms or other compound leaves. Used by Linnaeus for the leaves of palms.

Fruit. The ripened ovary (pistil) with the adnate parts; the seed-bearing organ.

Furcate. Forked.

Furrowed. With longitudinal channels or grooves.

Gamopetalous. With a corolla of 1 piece, the petals united, at least at the base, the corolla removable as a single structure; sympetalous.

Gamosepalous. With a calyx whose sepals are marginally connate, in whole or in part.

Gemma. An asexual propagule sometimes appearing as but not homologous with, a vegetative bud.

Glandular. Having or bearing secreting organs, or glands.

Glaucous. Covered with a bloom, or whitish substances that rubs off.

Gynoecium. The female element of a flower.

Head. A short dense spike; capitulum.

Herb. Plant naturally dying to the ground; without persistent stem above ground; lacking definite woody firm structure.

Herbaceous. Nit woody; dying down each year; said also of soft branches before they become woody.

Herbage. Vegetative parts of plant.

Hermaphroditic. Bisexual.

Hilum. In the seed, the scar or mark indicating the point of attachment.

Hispid. Provided with stiff or bristly hairs.

Husk. An outer covering of some fruits, usually derived from perianth or involucre.

Imbricated. Overlapping, as shingles on the roof.

Indehiscent. Not regularly opening, as a seed pod or another.

Indeterminate. Said of those kinds of inflorescence whose terminal flowers open last, hence the growth or elongation of the main axis is not arrested by the opening of the first flowers.

Inferior. Beneath, lower, below; as an inferior ovary, one that seemingly is below the calyx leaves.

Inflorescence. Mode of flower bearing; technically less correct but much more common in the sense of flower cluster.

Interrupted. Not continuous; in particular, referring to the interposition of small leaflets or segments between others.

Lactiferous. Producing or bearing latex.

Lamina. A blade or expended portion.

Lanceolate. Lamce-shaped; much longer than broad; widening above the base and tapering to the apex.

Latex. Milky sap.

Leaflet. One part of the compound leaf; secondary leaf.

Legume. Simple fruit dehiscing on both sutures, and the product of a simple uni-carpellate ovary.

Linear. Long and narrow, the sides parallel or nearly so as blades of most grasses.

Lip. One of the parts in an unequally divided corolla or calyx; these parts are usually two, the upper lip of orchids is by a twist of the ovary made to appear as the lower's labium.

Lobe. Ay part or segment of an organ; specifically, a part of petal or calyx or leaf that represent a division to about the middle.

Locule (Loculus). Compartment or cell of an ovary, anther, or fruit, a descriptive term lacking morphological meaning.

Membranous, Membranaceous. Of parchment-like texture.

Midrib. The main rib of a leaf or leaf-like part, a continuation of the petiole.

Monoecious. With staminate and pistillate flowers on the same plant, as in corn. See dioecious.

Nectary. A nectar-secreting gland, often appearing as a protuberance, scale, or pit.

Node. A joint where a leaf is borne or may be borne; also incorrectly, the space between two joints, which is properly an internode.

Nut. An indehiscent one-celled and one-seeded hard and bony fruit, even if resulting from a composed ovary.

Oblique. Slanting; unequal-sided.

Oblong. Longer than broad, and with the sides nearly or quite parallel most of their length.

Obovate. The reverse of ovate, the terminal half border than the basal.

Obtuse. Blunt, rounded.

Ovoid. A solid that is oval (less correctly ovate) in flat outline.

Palate. In personate corollas, a rounded projection or prominence of the lower lips, closing the throat or very nearly so.

Palmate. Lobed or divided or ribbed in a palm like or hand like fashion; digitate, although this word is usually restricted to leaves compound rather than to merely ribbed or lobed.

Panicle. An intermediate branching raceme; an inflorescence in which the branches of the primary axis are racemose and the flowers pedicellate.

Pectinate. Comb-like or pinnatifid with very close narrow divisions or parts; also used to describe condition in cacti when small lateral spines lateral spines radiate like comb teeth from arcole.

Pedicel. Stalk of one flower in a cluster.

Peduncle. Stalk of a flower cluster, or of a solitary flower when that flower is the remaining member of an inflorescence.

Perianth. The two floral envelopes considered together; a collective term for the corolla and calyx; perigone.

Periphery. The outer wall or margin; the inner side or face of the ovary wall as opposed to the faces of its septa.

Persistent. Remaining attached; not falling off.

Petiole. Leaf stalk.

Petiolule. Stalk of a leaflet.

Phanerogam. A seed plant or spermatophyte, as opposed to a cryptogam.

Phylloclade. A branch more or less flattened, functioning as a leaf as in Christmas cactus.

Pinna. A primary division or leaflet of a pinnate leaf.

Pinnate. Feather-formed; with the leaflet of a compound leaf placed on either side of the rachis.

Pistil. A unit of the gynoecium comprised of ovary style (when present) and stigma.

Placentation. The arrangement of ovules within the ovary.

Pollen. Spores or grains borne by the anther containing the male element (gametophytic).

Polyploid. A plant with a chromosome complements of more than two sets of the monoploid number.

Polymorphic. Represented by two, or more forms as a species of many closely related infraspecific taxa; very variable as to habit or some morphological feature.

Prickle. A small and weak spine-like body borne irregularly on the bark or epidermis.

Procumbent. Trailing or lying flat, but not rooting.

Prostrate. A general term for lying flat on the ground.

Pungent. Ending in a stiff sharp point or tip; also, acride (To the taste).

Racemose. Having flowers in raceme-like inflorescences that may or may not be true racemes.

Ray. Outer modified floret of some composites, with an extended or strap-like part to the corolla; also, a branch of an umbel or umbel-like inflorescence.

Recurved. Bent or curved downward or backward.

Reniform. Kidney-shaped.

Reticulate. Netted.

Rhizome. Underground stem; rootstock: distinguished from a root by presence of nodes, bits or scale-like leaves.

Rotund. Nearly circular; orbicular inclining to be oblong.

Rudimentary. Imperfectly developed and non-functional. See Vestigial.

Runner. A Slender trailing shoot taking root at the nodes.

Saprophyte. A plant (usually lacking chlorophyll) living on dead organic matter as Monotropa.

Scale. A name given to many kinds of small, mostly dry, and appressed leaves or bracts, obtain only vestigial.

Seed. The ripened ovule; the essential part is the embryo, and this is contained within integuments.

Sepal. One of the separate parts of a calyx, usually green and foliaceous.

Serrate. Said of a margin when saw-toothed with the teeth pointing forward.

Sessile. Not stalked; sitting.

Sheath. Any long or more or less tubular structure surrounding an organ or part.

Shrub. A woody plant that remains low and produce shoots or trunks from the base, not treelike nor with a single bole; a descriptive term not subject to strict circumscription.

Simple. Said of a leaf when not compounded into leaflets, of an inflorescence when not branched.

Smooth. Said of surface that have no hairiness, roughness, or pubescence, particularly of those not rough or scarbrous. See Glabrous.

Solitary. Bore singly or alone.

Spadix. A thick, or fleshy spike of certain plants, surrounded or subtended by a spathe.

Spathe. The bract or leaf surrounding or subtending a flower cluster or a spadix; it is sometimes colored and flower like, as in the calla.

Spike. A usually unbranched, elongated, simple, indeterminate inflorescences whose flowers are sessile, the either congested or remote; a seemingly simple inflorescences whose flowers may actually be composite head (Liatris) or other inflorescences types (Phleum).

Spine. A strong and sharp-pointed woody body mostly arising from the wood of the stem.

Sporangium. A spore case, a sac or body, usually composed of a single detached cell and containing a nucleated mass of protoplasm (but no embryo) and capable of developing into a new individual; used particularly in reference to the pteridophytes and lower point.

Spore. A simple reproduction body, usually composed of a single detached cell and containing a nucleated mass of protoplasm (but no embryo) and capable of developing into a new individual; used particularly in references to the pteridophytes and lower plants.

Spreading. Standing outward or horizontally.

Stalk. The "stem" of any organ, as the petiole, peduncle, pedicel, filament, stipe.

Stamen. The unit of the androecium and typically composed of anther and filament, sometimes reduced only an anther; the pollen bearing organ of a seed plant.

Staminate. Having stamens and no pistils; male.

Stem. The main axis of a plant, leaf-bearing as distinguished from the root-bearing axis.

Stigma. The part of the pistil that receive the pollen.

Stipule. A basal appendage of a petiole; the three parts of a complete leaf are blade, petiole, stipules (usually two).

Stolon. A shoot that bends to the ground and take root; more commonly, a horizontal stem at or below surface of the ground that gives rise to a new plant at its tip.

Stomata. The pore in a leaf (frequently the lower side) formed by the concavity of two sausage-like guard cells.

Style. More or less elongated part of the pistil between the ovary and the stigma.

Subshrub. A suffrutescent perennial (the stems basally wood), or a very low shrub often loosely treated as a perennial.

Succulent. Juicy; Fleshy; soft and thickened in texture.

Symmetrical. Said of an actinomorphic flower that has the same number of parts in each series or circle, as five stamens, five petals.

Sympetalous. The petals united, at least at the base; see Corolla.

Tapering. Gradually becoming smaller or diminishing in diameter or width toward one end; not abrupt.

Tendril. A rotating or twisting threadlike process or extension by which a plant grasps an object and clings to it for support; morphologically it may be stem or leaf.

Tepal. A segment or unit of those perianths not clearly differentiated into typical corolla and calyx, as in tulip, onion or pokeweed.

Terminal. At the tip, apical, or distal end.

Terrestrial. Of the ground; a land plant, as opposed to aquatics, epiphytes, or saprophytes.

Tomentose. With tomentum; densely wooly or pubescent; with matted soft wool, like hairiness.

Tree. A woody plant that produces one main trunk or bole and a more or less district and elevated head.

Trichome. A hair or bristle.

Tuberous. Bearing or producing tubers.

Twig. A young woody stem; more precisely the shoot of a woody plant representing the growth of the current season and terminated basally by circumferential terminal-bud scar.

Umbel. An indeterminate, often flat-topped inflorescence whose pedicels and peduncles (rays) arise from a common point, resembling the stays of an umbrella.

Umbellate. Umbelled; with umbels; pertaining to umbels.

Undulate. Wavy (up and down, not in and out), as some leaf or petal margins.

Unilocular. Containing a single chamber or cell.

Urticle. A small bladder; more commonly, a bladdery, one-seeded, usually indehiscent fruit.

Vaginate. Sheathed.

Vascular. Pertaining to the presence of vessel in the conducting tissue of the steles.

Venation. Veining; arrangement or disposition of veins.

Versatile. Hung or attaches near the middle and usually moving freely, as an anther attached crosswise on apex of filament and capable of filament and capable of turning.

Voluble. Twinning.

Whorl. Three or more leaves at one node, in a circle.

Wing. A thin dry or membraneceous expansion or flat extension or appendage of an organ.

Woolly. Provided with long, soft, and more or less matted hairs; like wool; lanate.

Xerophyte. A plant of a dry arid habitat, such as the desert.

Zygomorphic. Said of corollas when divisible into equal halves in one plane only, usually along an anterior-posterior line. See Actinomorphic, Irregular.

SUMMARY

Non-timber forest products are biological materials obtained from forests other than wood. NTFPs are crucial for ensuring livelihood security, growth and income generation for indigenous peoples living in forests and nearby villages. Compared to timber harvesting, the collection of NTFPs is less harmful to forest ecosystems, addressing the global concerns such as deforestation, pollution, rural poverty and sustainable development. Moreover, NTFPs hold significant cultural importance for many indigenous communities worldwide. They are vital role in promoting rural development, improving financial conditions, preserving cultural traditions and maintaining environmental health in local, national and international markets. In Nepal, NTFPs contribute 5% of the national GDP, accounting for a significant portion of the 15% contribution from the forestry sector.

ACA, the largest conservation area in Nepal, characterized by wide altitudinal variations and diverse climatic conditions, foster a rich diversity of plants including NTFPs. The main objective of the assessment was to prepare NTFPs inventory and sustainable harvesting plan for ACA to benefit the local community. The specific objective was to identify and quantify NTFPs of the ACA region; assess the status and distribution of prioritized NTFPs and document the ethno-botanical knowledge that existed in the area. The methodological framework followed the protocol provisioned in NTFPs Resource Survey Guideline, 2069 developed by Department of Forest, MoFSC.

The assessment identified 345 NTFPs species in ACA. Among them 84 are under the prioritized category. The highest number of socially prioritized NTFPs were found in Bhujung UCO (51), followed by Sikles UCO (33), Manang UCO (29) and so on. Notably, Yarshagumba (*Ophiocordyceps sinensis*), Kutki (*Neopicrorhiza scrophulariiflora*), Nirmasi (*Delphinium Denudatum*), Satuwa (*Paris polyphylla*) and Padamchal (*Rheum australe*) are the most highly desired NTFPs, prioritized by 61.40%, 59.64%, 57.89%, 50.87% and 49.12% of CAMCs, respectively. Over half (58.82%) of the prioritized species are used for local consumption, 28.23% serve both local and commercial purposes and 24.71% are used solely for commercial purposes. Yarshagumba and Kutki are particularly favored in the CAMCs of ACA.

1. BACKGROUND

Non-timber forest products (NTFPs) encompass all biologically derived products, excluding timber, from forest or non-forest areas (MoFE, 2019). In Nepal, the NTFPs are also termed as *Jaributi* (herbs) and include all biological materials and different services rendered by forest land; for example, medicinal materials, fibers, dyes, gums, fatty oils, wild edible products (vegetables, fruits, spices and condiments), agricultural implements, thatching grasses, rattan, resins, pesticides, animal bedding, veterinary medicines, green manure, ornamental plants, cosmetics, ceremonial products, tannins, charcoal, honey, food, etc., and wildlife products are grouped as NTFPs (GoN/MoFSC, 1993). They play a crucial role in enhancing rural livelihoods, food security, and income generation, while also contributing to biodiversity conservation (Bhatt, 2008; Ghimire et al., 2021; Pandey et al., 2016; Shrestha et al., 2020). NTFPs offer opportunities for entrepreneurial ventures and align with biodiversity conservation goals (FAO, 1995). To advance the sector, it is imperative to prioritize NTFP-oriented forest management, integrate community forestry, foster research on wild species domestication, conserve genetic diversity, promote cultivation and value addition activities, and engage rural and disadvantaged groups. Addressing legal and policy issues and ensuring sustainable harvesting practices are also critical (Ghimire et al., 2021). Over the past decades, conservation and development-focused organizations have advocated for increased attention to NTFPs, urging governments, including Nepal's, to develop policies supporting their sustainable utilization. (Belcher et al., 2005; Ghimire et al., 2021; Subedi, 2003.)

The global significance of NTFPs varies across regions and biomes, encompassing economic, cultural, and livelihood dimensions as evidenced by various studies. NTFPs holds such a huge economics that at least 29 million people depend on these for subsistence income in Southeast Asia (NTNC-CODEFUND, 2017). In 2014, the global trade value of NTFPs exceeded USD 33 billion (Vasisht et al., 2016). Similarly, global trade of MAPs alone was valued at around US$ 60 billion in 2000, which is expected to grow to US $ 5 trillion in 2050 (NTNC-CODEFUND, 2017). While in developed nations, NTFPs are often utilized for cultural, recreational, and conservation purposes, in developing countries, particularly across Africa and Asia, they serve as vital sources of subsistence living and income generation (Cocksedge, 2006; Endamana D et al., 2016; Suleiman et al., 2017). These resources play a critical role in poverty alleviation and improving household livelihoods in diverse geographical contexts, serving as safety nets during agricultural production deficits or emergencies (Shackleton & Shackleton, 2014; Suleiman et al., 2017). For instance, in Uganda's wetlands, NTFPs contribute significantly, accounting for 53% of household income (Gosling et al., 2017). Similarly, urban areas in Malaysia benefit from NTFPs, with a substantial 24% contribution to the economy (Kaoma & Shackleton, 2015). Moreover, forest-based activities, especially in NTFP-rich regions like Nigeria, provide millions of formal and informal jobs (The Phuong & Huu Duong, 2008), with NTFP sales often constituting a significant portion of household income, reaching 80% in some areas (Jimoh et al., 2013).

Nepal, characterized by its diverse altitude and climate, is abundant in NTFPs. In total 7,000 species of vascular plants are found in Nepal and more than 2,000 species are regarded as producing the NTFPs, among which 1,624 species are estimated to have medicinal uses (MoFSC, 2012). With a history spanning over a thousand years, Nepal has traditionally exported medicinal plants to India and China (Dobremez, 1976; Hamilton, 1819; Kirkpatrick, 1811). Among 1624 medicinal valued NTFPs,

238 chemically tested and 130 traded (GON, 2004; MoFSC, 2012; Subedi, 2003). Nepal has consistently exported substantial quantities of Medicinal and Aromatic Plants (MAPs) products, averaging 13,230 metric tons annually, valued at USD 39.34 million, to over 50 countries (Ghimire et al., 2016). Particularly crucial in the Himalayan region, NTFPs serve as vital resources for rural communities, providing food, nutrition, medicine, and other essentials (Ahenkan et al., 2010). In the mountains of Nepal, 10-100% of households are involved in the collection of medicinal plants and other NTFPs; and in certain rural areas, this contributes up to 50% of the family income. NTFPs significantly contribute to household income and employment, with rural Nepalese households extensively involved in their commercial collection (Larsen & Olsen, 2007). For instance, in areas like Darchula, over 50 % of households participate in NTFP collection, offering significant economic opportunities (Gurung et al., 2021; Timmermann & Smith-Hall, 2019; Yadav et al., 2019). The NTFP sub-sector contributes approximately 5% to Nepal's GDP, with a significant portion of products exported to India (ANSAB, 1999; MoFSC, 2009). More than 160 types of NTFP species are harvested from the wild and traded internationally, with 95% collected from the wild and 90% exported to India in raw form (MoFSC, 2012).

In Nepal, NTFPs play a crucial role across economic, ecological, and cultural domains, reflected in a spectrum of policies and initiatives aimed at their sustainable management and utilization. Key among these is the National Forestry Plan (1976), the Master Plan for the Forestry sector (1988), and subsequent Forest Acts (1993), regulation 1995 and Forest Act (2019), alongside international agreements such as the Convention on Biological Diversity (CBD) and the Convention on International Trade in Endangered Species of Flora and Fauna (CITES). These policies underscore Nepal's commitment to prioritizing NTFPs, biodiversity conservation, and community forestry as integral components of its economic development strategy. The Forest Act of 2019, for instance, includes provisions to regulate the collection, sale, distribution, and export of endangered and significant NTFP species. Moreover, the tenth plan emphasizes the critical role of NTFPs in driving ecotourism, biodiversity conservation, and poverty reduction. (NPC, 2002). However, challenges persist, particularly in the exploitation of local producers and collectors by resourceful traders, limiting the potential of NTFPs to support livelihoods and contribute to poverty reduction (Ojha, 2000; Shrestha-Acharya & Heinen, 2006). While recent policies such as the Nepal National Biodiversity Strategy and Action Plan (2014) and the forest policy of 2019 emphasize sustainable NTFP use and management, their effectiveness remains constrained by gaps in implementation and enforcement (Larsen et al., 2000; Uprety et al., 2016). Addressing these challenges requires administrative expansion and simplification of existing policies, along with the formulation of a dedicated NTFPs management strategy and action plan, providing a comprehensive framework for sustainable NTFP management (P. Ghimire et al., 2021).

1.1 NTFPs and Sustainable Management

NTFPs are tangible and physical objects of biological origin derived from forests, excluding wood (GFRA, 2020). Sustainable management of NTFPs is crucial, with sustainable harvesting as a critical tool. Harvesting is sustainable when it ensures the long-term persistence of harvested populations and does not negatively impact other species, communities, or ecosystem functions (Ticktin & Shackleton, 2011). Sustainable harvesting requires understanding the structure and dynamics of harvested species to prevent declines in population size and resource availability due to harvesting. Despite the vital role of NTFPs in healthcare, socio-cultural practices, and economic sustenance for millions of people, their

high demand often leads to haphazard collection from marginal or ecologically sensitive areas. Moreover, relying only on traditional knowledge for harvesting decisions and the lack of advanced scientific tools contribute to sustainability challenges. Illegal and premature collections further threaten NTFP sustainability (NTNC-CODEFUND, 2016). High-demand NTFPs such as 'Bans', Sisam, Sal, Bijaya Sal, and Shilajit face extinction risks due to extensive trade and collection pressure (Bhatt, 2008). For instance, Chiraito in the mid-hills, especially in eastern Nepal, suffers from rampant wild collection without allowing plants to reach maturity, despite limited cultivation attempts (Poudel, 2007). To address these challenges, creating proper inventories and developing sustainable harvesting protocols are critical (Lamichhane et al., 2021).

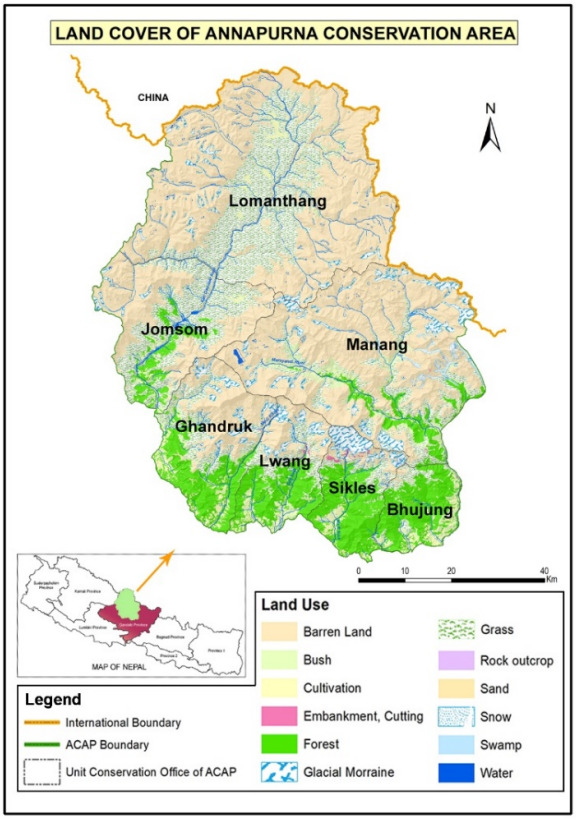


Figure 1: Administrative Division of ACA

Transitioning from the discussion of NTFP sustainability challenges, the report focuses on the sustainable management of NTFP resources in the Annapurna Conservation Area (ACA) from 2024 to 2029. Covering 7,629 sq.km, ACA is Nepal's first and largest conservation area, encompassing a diverse range of ecosystems, from sub-tropical Sal forests to sub-alpine meadows and trans-Himalayan cold deserts. It boasts 22 forest types and 29 ecosystem types, fostering rich floral and faunal diversity (Baral et al., 2019). ACA is biologically significant with 1884 vascular plant species, including 102 endemics to Nepal, and 345 NTFP species, of which 84 are highly

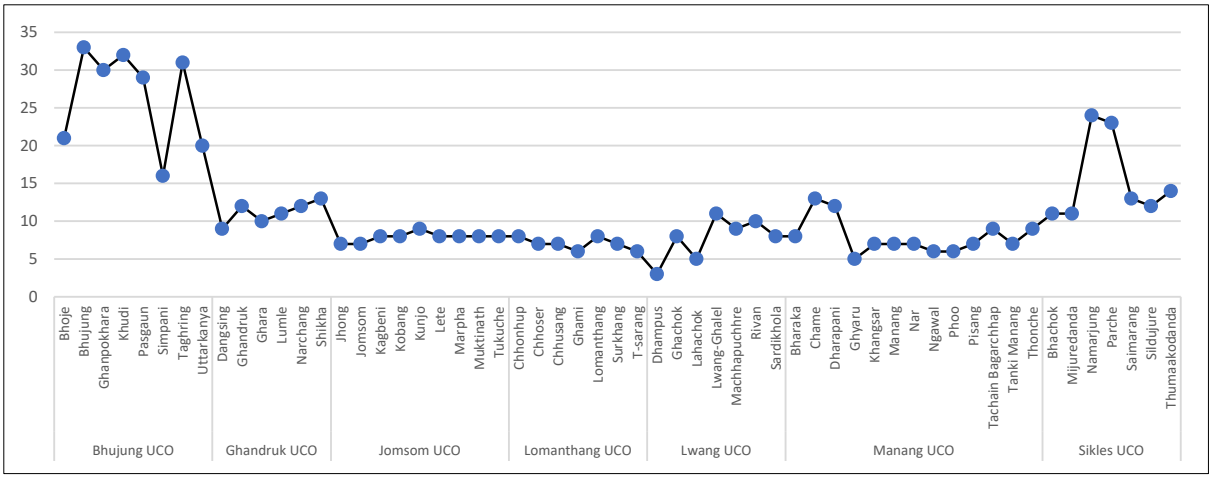


Figure 2: Number of Commercial NTFPs in each CAMCs of ACA

prioritized, (NTNC-CODEFUND, 2016; Tiruwa et al., 2022, 2024). Key NTFPs in ACA include Yarshagumba (*Cordycep sinensis*), Timur (*Zanthoxylum armatum*), Niguro (*Dryopteris cochleata*),

Ban lasun (*Allium wallichii*), and Kutki (*Neopicrorhiza scrophulariiffolia*), with over Nr. 30,50,272 collected during FY 2079/80 (NTNT-ACAP, 2080). While the first inventory and sustainable harvesting plan for

NTFPs were drafted in 2009, followed by an update in 2017, the latter aimed to bridge gaps by developing annotated checklists of NTFPs, their distribution, and growing stock. It prioritized key NTFPs in trade or local use and proposed sustainable harvesting practices to regulate annual limits. Building on the foundation laid by the 2017 report, the 2024-2028 plan addresses identified gaps, including the lack of highly prioritized NTFPs in Unit Conservation Offices (UCOs) lists, errors in species identification, and ambiguity in reported harvestable quantities. Methodologies for refining reported quantities and implementing quality assurance measures have been enhanced, ensuring improved accuracy, transparency, and effectiveness in NTFP management within the ACA.

1.2 Rationale

In the ACA, careful management of NTFPs is crucial to maintain both environmental health and support for local communities. To achieve this, it's essential to gather detailed information about the plants and resources in the area. These information-gathering efforts, known as inventories, provide valuable insights into the distribution, abundance, and ecological significance of NTFPs.

By employing rigorous scientific methods to conduct these inventories, we can make informed decisions about the sustainable utilization of NTFPs. For instance, we can determine appropriate harvesting levels that ensure the preservation of biodiversity and ecosystem integrity. This approach allows us to strike a balance between meeting the needs of local communities and safeguarding the natural environment.

The significance of these inventories extends beyond mere data collection; they serve as a means to harmonize human activities with ecological conservation goals. By integrating modern scientific techniques with traditional knowledge systems, we can effectively manage NTFP resources while respecting local customs and cultural heritage. Ultimately, by utilizing inventories to guide NTFP harvesting practices in the ACA, we demonstrate our commitment to responsible environmental stewardship and the well-being of both present and future generations.

2. APPROACH AND METHODOLOGY

2.1 Approaches

2.1.1 Knowing the subject:

A thorough strategy for the sustainable harvesting of non-timber forest products (NTFPs) should consider the importance of the issue and include involvement from all levels, from top executives to grassroots communities. The ACA is well known for its work in extension and conservation awareness. As a result, a team of experts worked even harder to increase awareness among people and organizations inside each Conservation Area Management Committee. This was necessary because the community was being taught about new issues like climate change, the necessity for alternate sources of income, the Phasing-Out Approach, and governance duties in managing NTFPs sustainably.

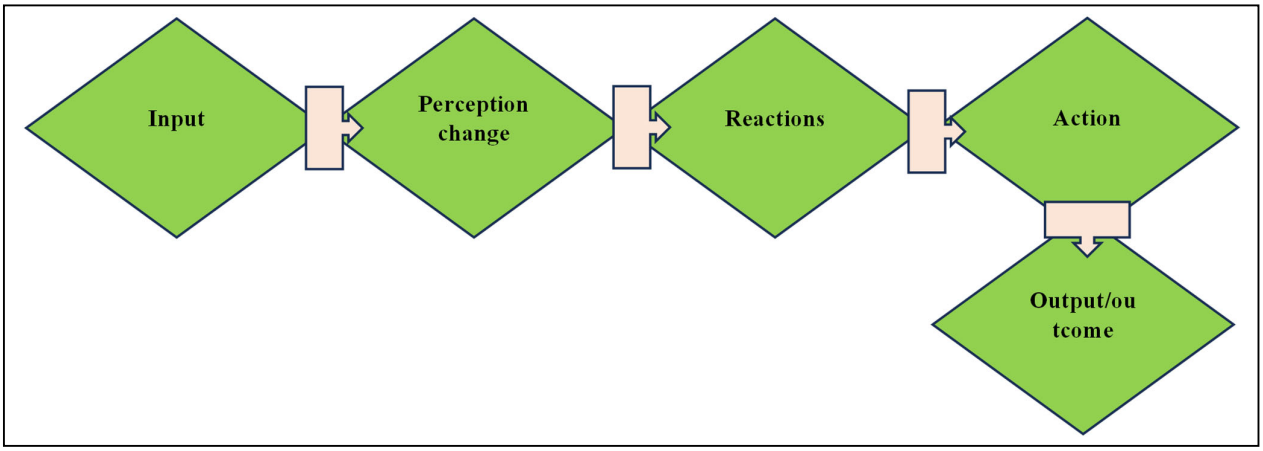


Figure 3 Action chain with Impact flow to Outcome level

Following the Participation Action Chain illustrated in Figure 2, this procedure facilitates the collection of inputs that shift perceptions and evaluate responses, transforming them into participatory actions. By utilizing community concerns and inputs to enhance the production and outcome levels of the Sustainable Harvest Plan (3rd edition), this approach aids in understanding the development of the NTFPs Sustainable Harvest Plan for ACA in the current context.

Employing participatory methods such as focus groups discussion, community mapping, and key informant interviews techniques. The study adopted a consultative and inclusive approach to assess the perspectives of various interest groups and stakeholders.

2.1.2 Making the process inclusive

The expert team embraced inclusive participatory and interactive methodologies throughout the formulation of this harvesting plan.

2.1.3 Collaborative approach

Creating this harvesting plan involved a careful and detailed process where everyone got to participate. We made sure to work closely with CAMCs, Forest Management Sub-committees and local people to help us figure out the best ways to inventory and sustainably harvest non-timber forest products in the ACA.

2.2 Methodology

ACAP prepared this NTFPs sustainable harvesting plan of ACA in consultation with different expertise and stakeholders. For this ACAP form the expert team and their role is depicted in figure-2. The methodological framework is developed to meet the ACA geography specification following the NTFP resource survey guideline, 2069. The methodological framework utilized in this assignment is depicted in figure 4 and 5 and includes 12 steps.

Step 1: Formation of Expert Team

NTNC-ACAP formed expert team that constitutes following:

1. **Principal coordinator:** Project chief is the principal coordinator. He supervised the entire inventory process, ensuring it aligned with project goals and objectives. Needful instructions and suggestions were given to major coordinators and field coordinators throughout the project to develop the NTFPs sustainable harvesting plan.
2. **Theme coordinator:** Conservation officers from the headquarters are the theme coordinator. They played a crucial role in organizing and supporting field activities. They oriented the field team leaders and expert team for well execution of the methodological framework and get fine data and their interpretation. In addition, they provided logistical support, liaised with relevant authorities and ensured that resources were allocated efficiently.
3. **Field Team Leaders:** Field Team Leaders from the seven UCOs were responsible for facilitating field activities within their respective areas. They mobilized expert teams including Natural Resource Conservation Assistant (NRCA), Local Resource Person (LRP), GIS expert

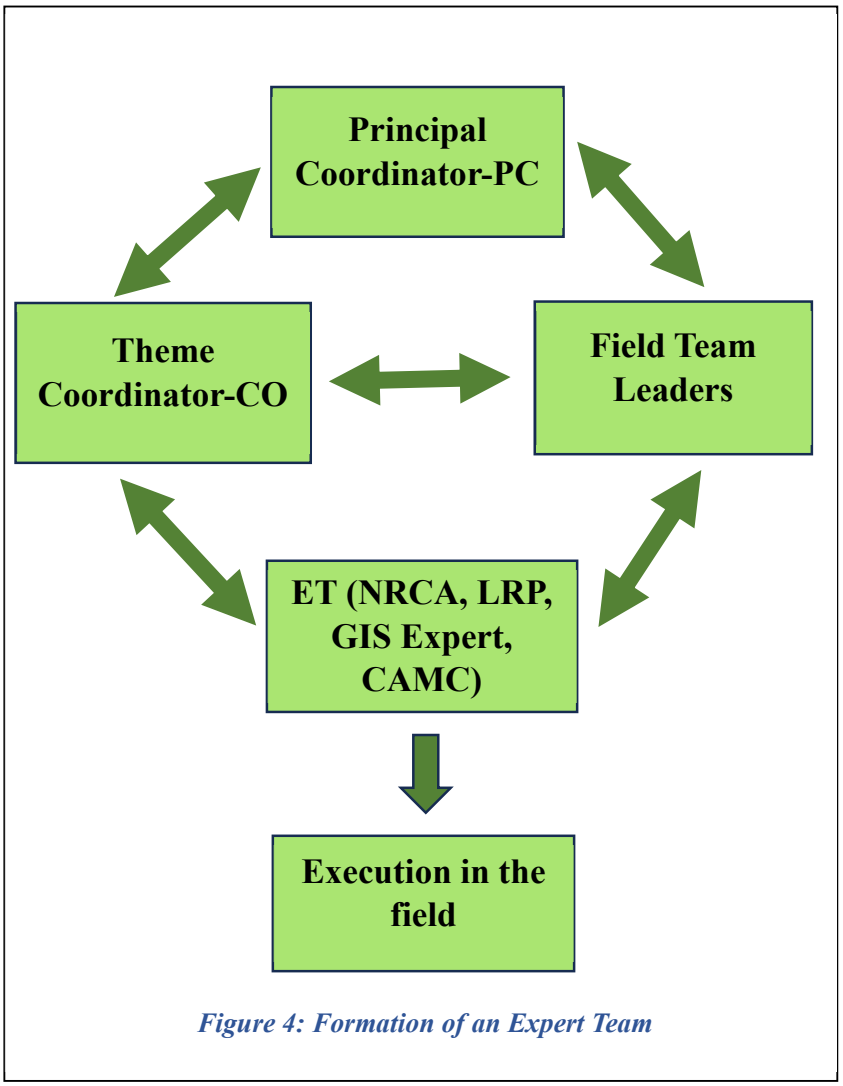


Figure 4: Formation of an Expert Team

and member from CAMCs. Additionally, they coordinated community participation and ensured that field work proceeded smoothly.

4. **Expert Team:** The ET comprised individuals with specialized expertise essential for the inventory process. This included experts from the NRCA, LRP, a GIS expert and member from CAMCs. They contributed to data collection, analysis and decision-making during field execution.

   During field execution, these teams worked collaboratively to conduct assessments, inventory NTFPs and gather relevant data. They adhered to established methodology and guidelines, ensuring consistency and accuracy in data collection. The ET provided technical support and guidance to field teams while Team Leader facilitated community engagement and ensured local participation. Regular communication and coordination between all stakeholders were maintained to address challenges and make necessary arrangements during the execution process. This collaborative approach ensured the success of the inventory activities and contributed to overall activities of the project.

Step 2: Inception planning workshop

An inception planning workshop was held before execution of the field work. The NTNC-ACAP Headquarter organized the workshop in participation of principal and theme coordinators along with field team leaders and expert teams where methodological framework was discussed and finalized. The finalized framework was circulated to entire UCOs for its effective execution. The needful virtual meetings were conducted among the theme coordinators and field team leaders and expert team.

Step 3: Desk review and literature review

The ET reviewed relevant literature, including both published and unpublished sources. This encompassed policies, rules, regulations, GIS modeling tools, assessments of NTFPs, map-based NTFPs inventories, past inventory records, reports from national and international entities, international practices, and other pertinent literature. Annual reports form NTNC-ACAP, operational plans of CAMCs, and laws and policies pertaining to NTFPs harvesting were reviewed.

Step 4: Consultation with concerned stakeholders:

Extensive consultations were held with CAMCs, Sub-committees, Rural municipalities and local peoples with shared interests and objectives. Various communication tools such as semi-structured questionnaires, interviews, emails, and social media platforms were utilized. This collaborative effort enabled the collection of concerns, issues, and insights from these partners before field assessment and observation. This input was crucial in refining assessment methods and processes and identifying key issues for the sustainable harvesting plan.

Step 5: Field planning and preparation

ET planned the field assessment schedules and finalized the field site in collaboration with NTNC-ACAP and relevant stakeholders.

Furthermore, prepared the checklist of major NTFPs of each CAMC before departing to field. Besides this, they prepared the essential field gears (like nails, tape, rope, GPS, map, Knife, notebook other logistic materials) for assessment.

Step 6: Field Assessment and Inventory

6.1. NTFPs preference mapping

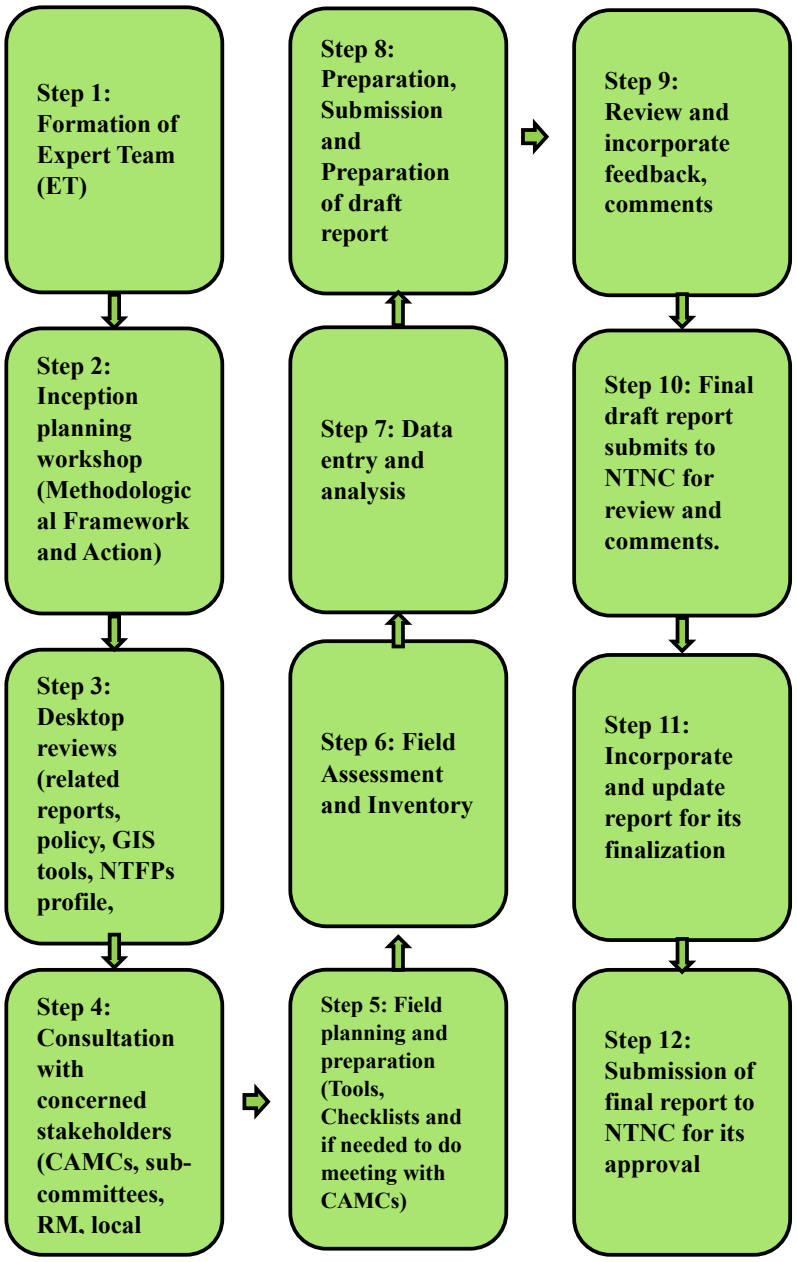


Figure 5: Overall Inventory Framework

A collaborative effort was undertaken through CAMC-level consultative workshops to gather insights into NTFPs and their preferences. Each CAMC member was invited, alongside NTFP collectors, local traders, traditional healers (Amchis), and governmental and non-governmental stakeholders. The workshops focused on enumerating NTFPs within each CAMC area. They also made preference ranking of NTFPs based on their economical, medicinal and domestic use value and availability, by following the methodology outlined by Gurung & Pyakurel, (2006). To visualize the distribution of these prioritized NTFPs, potential sites were delineated on topographic sheets using social mapping techniques. Further refinement involved stratifying these areas based on NTFP availability levels, categorized as less, moderate, or high. This collaborative approach aimed to comprehensively assess NTFP resources and preferences, laying a foundation for informed decision-making in subsequent planning processes.

This step was focused on mapping the hotspots of NTFPs that involved creating distribution, area occupied and abundance of preferred species within the study area by using various tools and methods that includes GIS, secondary resources and collaboration with CAMCs.

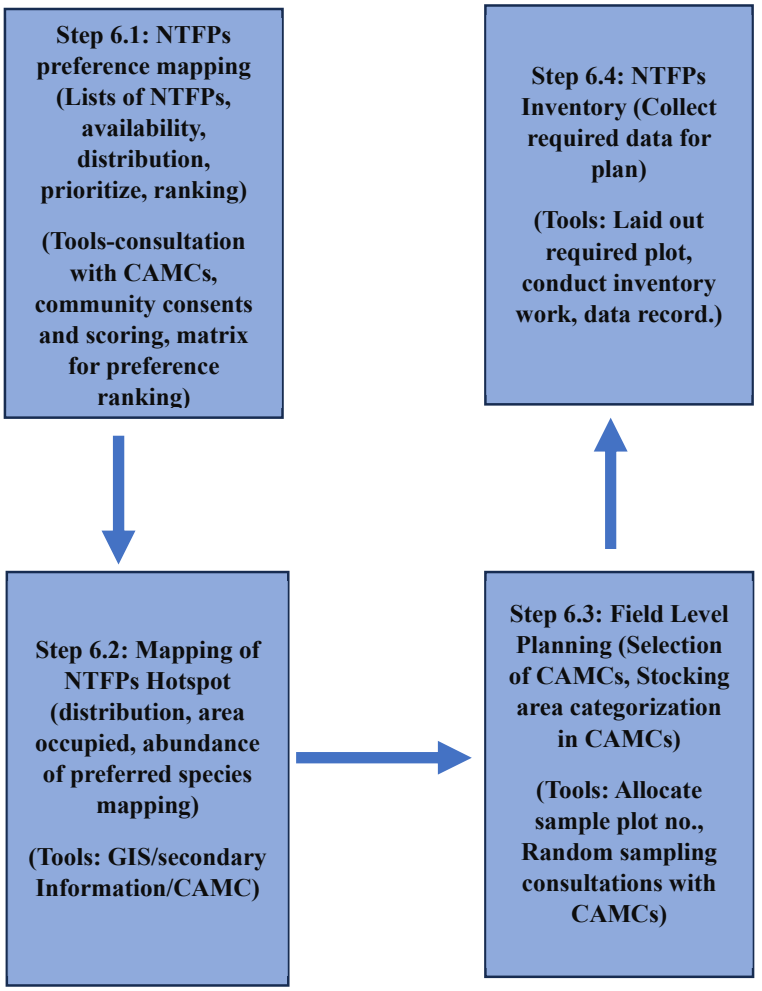


Figure 6: Field Assessment and Inventory Details

6.3 Field level planning

In the sustainable harvest planning process for NTFPs, the focus is on selecting CAMCs and categorizing stocking areas within these committees. This step was crucial for ensuring that NTFP harvesting conducted sustainably and in line with conservation objectives.

By following NTFPs Inventory Guideline 2069, sample plot number were allocated to designated areas within the CAMCs. These sample plots served as representative sites for assessing NTFP abundance, distribution, and ecological impact. Random sampling techniques were utilized to ensure unbiased selection and accurate data collection across the CAMCs.

Consultations with CAMCs were essential during this step. Engaging with local communities and stakeholders allowed for the integration of traditional knowledge and practices into the harvesting plan. CAMCs acted as mediators, facilitating discussions and decision-making processes to ensure community involvement and support.

Following consultations, the categorization of stocking areas within CAMCs was conducted based on collected data and community input. Areas were classified according to NTFP abundance, ecological sensitivity, and management priorities. This categorization enabled the development of targeted harvesting strategies tailored to the specific characteristics and needs of each area.

In summary, step 6.3 of the sustainable harvest planning process involved selecting CAMCs, allocating sample plots, conducting consultations, and categorizing stocking areas. By engaging stakeholders, utilizing random sampling, and categorizing areas, this step laid the groundwork for sustainable NTFP harvesting practices within the ACA.

6.4 NTFPs Inventory

Random sampling was employed to conduct the inventory of NTFPs. Plots within the identified NTFP hotspots (Step 6.2) were allocated in stratified areas based on the density and abundance of NTFPs. The requisite number of areas for sampling was determined according to (NTNC-CODEFUND, 2016; Zobel et al., 1987) (refer to Annex 2). The locations of each inventory plot were accurately recorded using GPS technology. Concentric circular sampling plots, with a radius of 10 meters for trees, 2 meters for shrubs/saplings, and 0.57 meters for herbaceous species, were utilized for data collection, adhering to the relative analysis approach as described by NTFPs inventory guideline 2069 (refer to Annex 3). To record data in the field, specific tally sheets were employed (refer to Annex 4).

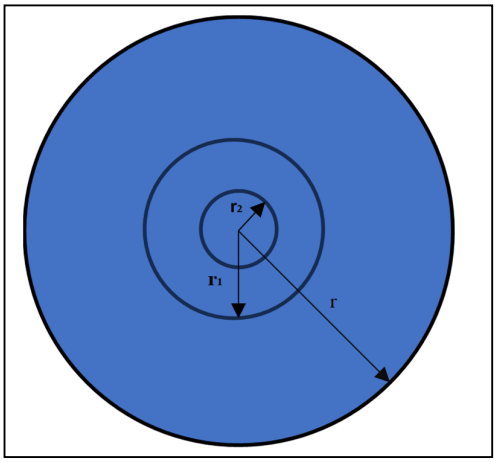


Figure 7: Layout of sample plot

Note: r=10m, r_1=4m and r_2=0.57m

Step 7: Data entry and Data analysis

Data entry and data analysis were crucial steps in the preparation of sustainable harvesting plan. Collected data were organized and analyzed through MS-excel to determine the sustainable harvesting amount of major NTFPs in ACAP. Similarly, Arc GIS 10.4.1 used to show the distribution patterns of NTFPs in different CAMCs. ET revisited data analysis and synthesis processes and updates all information from verification and triangulation processes by incorporating inputs from the field assessment, observation, inventory and consultative meeting and workshop.

Step 8: Preparation, submission and presentation of draft report

Each UCO prepared the separate NTFPs sustainable harvesting report and submitted to theme coordinator for its further review and update. The annual sustainable harvesting quantities of NTFPs were calculated based on resource inventory findings and growth parameters. Productivity and stock levels of each species, as well as production per plant and biomass (both fresh weight and dry weight) of harvestable parts, were assessed using data from field inventories. The assessment of sustainable harvesting amounts and procedures utilized through NTFPs inventory guideline 2069. Species dominance was evaluated using the Species Importance Value Index (IVI) and Prominence Value (PV), following methodologies outlined by Sharma and Chalise (2012). The individual NTFPs sustainable harvesting report was compiled together and shaped as a preliminary comprehensive report of NTFPs Inventory and Sustainable Harvesting Plan for ACA.

Step 9: Review and incorporate feedback comments

The draft report sent to the experts to include their input and concerns, and the comments were incorporated into the report. This step developed an amended version of draft report, the Penultimate Report.

Step 10: Final draft report submits to NTNC

After all the concerns from the experts incorporated in the draft report, a final draft report was prepared and submitted to NTNC for review and comment. Theme coordinator and ET incorporated all feedback, comments and suggestions obtained from NTNC in the Penultimate Report.

Step 11: Incorporate and update report for its finalization

A consolidated report was finally produced and finalized by incorporating all the concerns and inputs from experts and NTNC as the major delivery under this assignment i.e., FINAL NON-TIMBER FOREST PRODUCTS (NTFPS) INVENTORY AND SUSTAINABLE HARVESTING PLAN FOR ANNAPURNA CONSERVATION AREA PROJECT (2025-2029).

Step 12: Submission of final report to NTNC for its approval

NTNC-ACAP submitted final report of assignment i.e., NON-TIMBER FOREST PRODUCTS (NTFPS) INVENTORY AND SUSTAINABLE HARVESTING PLAN FOR ANNAPURNA CONSERVATION AREA PROJECT (2025-2029) along with all detail of financial expenses backstopped by proof/certificates; all tables and reports; photographs etc. NTNC is anticipated to provide Certificate of Accomplishment to NTNC-ACAP.

3. RESULT

3.1 Socio-Economy

According to the 2021 National Population and Housing Census, within the ACA at the Rural Municipality (RM) level, the population totals 114,766 individuals distributed across 31,873 households, with an average household size of 3.6 persons, below the national average of 4.37. Specifically, within ACA's jurisdiction, the population amounts to 77,2911 individuals residing in 18,531 households, averaging 4.17 persons per household. Among the UCOs, Lwang has the highest population at 26.25%, followed by Ghandruk at 21.42%, with Manang and Lomanthang having the lowest populations at 5.10% and 3.52%, respectively. Population density is greatest in Lwang, followed by Bhujung, while it is lowest in Lomanthang. The sex ratio is higher in Jomsom, Manang, Ghandruk, and Lwang, but lower in Lomanthang, Sikles, and Bhujung compared to the national average of 95.59 males per 100 females.

3.2 Literacy rate

The literacy rates across 7 UCOs in ACA shows notable differences. Lomanthang has a low literacy rate of 46.39% with a significant gender gap (58.63% male, 36.04% female). Manang and Jomsom both have literacy rates around 75%, with males significantly more literate than females. Ghandruk and Lwang have higher literacy rates of 79.2% and 80.3%, respectively, also showing gender disparities. Sikles has a literacy rate of 77.4%, while Bhujung is at 71%. Overall, the average literacy rate of is 72.05%, with males at 67.97% and females at 63.73%.

Table 1: Literacy rate in rural municipalities of ACA

UCOs	Rural Municipality	Population	Total population	Literacy Male %	Literacy Female %	Literacy rate (%)
Lomanthang	Lomanthang	1430	2722	58.63	36.04	46.39
	Lo Gekhar Damodarkunda	1292				
Jomsom	Varagaun Muktichhetra	2036	8604	82.13	67.93	75.20
	Gharpajhong	3712				
	Thasang	2856				
Manang	Narpa Bhumi	396	4938	83.27	66.32	75.13
	Manang Ngisyang	1595				
	Chame	1276				
	Nason	1671				
Ghandruk	Annapurna (Myagdi)	123123	34422	86.8	72.2	79.2
	Annapurna (Kaski)	22099				
Lwang	Machhapuchre	22898	22898	86.9	74.1	80.3
Sikles	Madi	16142	16142	86	69	77.4

UCOs	Rural Municipality	Population	Total population	Literacy Male %	Literacy Female %	Literacy rate (%)
Bhujung	Marshyangdi	17080	25040	78	60	71
	Kwhola sothar	7960				
Total average				67.97	63.73	72.05

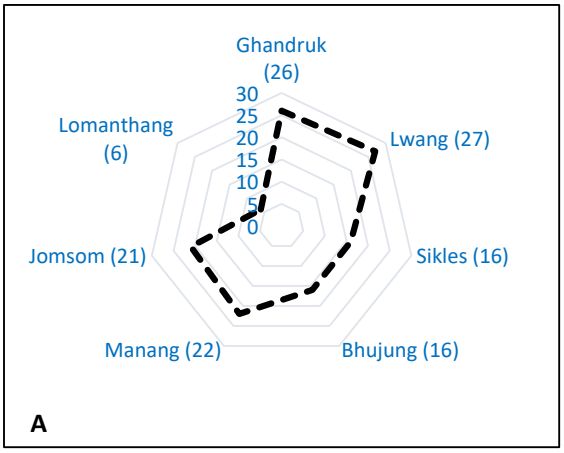
Source: https://censusnepal.cbs.gov.np/

3.3 Management of ACA

The ACA is Nepal's largest Protected Area (PA), covering 5.18% of the country's surface area and 27% of its total PA. Spanning 7,629 km2 between 83°34' to 84°25' E longitude and 28°15' to 28°50' N latitude, ACA encompasses 87 wards across 15 Gaunpalikas in five districts of Gandaki Province. It is divided into seven Unit Conservation Offices and 57 Conservation Area Management Committees, with a focus on involving local communities in resource conservation. Since 1992, ACA has been managed by NTNC following the ICDP model.

3.4 Caste/ Ethnic Composition

More than 36 ethnic groups with diverse cultural and linguistic backgrounds reside in the area. The Gurung community constitutes the largest portion at 26.81%, prominently clustered in Bhujung, Sikles, Ghandruk, and Lwang. Following Gurung are the hill Brahmins at 16.28%, then Bishwokarma at 12.7%, and Chhetri and Magar communities. In specific regions of ACA, Gurung are the predominant ethnic group in Bhujung, Manang, Lomanthang and Sikles UCOs, while Magars are the majority in Ghandruk, Hill Brahmins in Lwang, and Thakali in Jomsom UCOs.



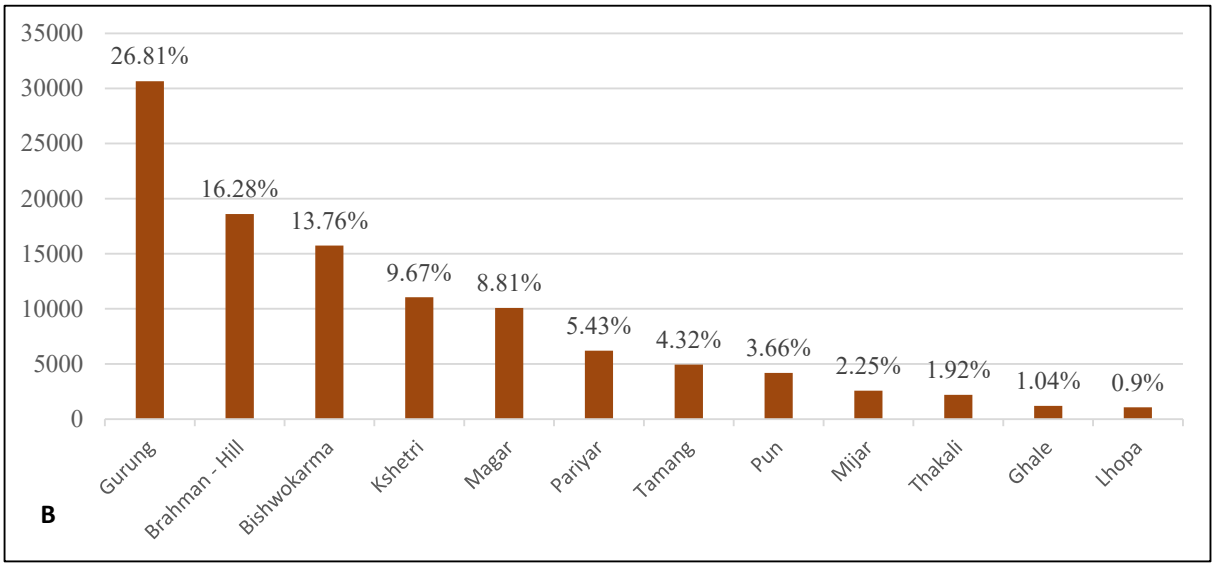


Figure 8: Ethnic composition of ACA UCO's (A) No. of ethnic group in the UCO & (B) Population (%) of 10 major ethnic groups.

In specific regions of ACA, Gurung are the predominant ethnic group in Bhujung, Manang, Lomanthang and Sikles UCOs, while Magars are the majority in Ghandruk, Hill Brahmins in Lwang, and Thakali in Jomsom UCOs.

Table 2: Major ethnic groups in ACA UCO

SN	Name of UCO	Dominant Caste/ethnicity	% of UCO population
1.	Bhujung UCO	Gurung	49.44
2.	Ghandruk UCO	Magar	18.84
3.	Lomanthang UCO	Gurung	56.32
4.	Lwang UCO	Brahmin Hill	28.76
5.	Manang UCO	Gurung	46
6.	Jomsom UCO	Thakali	22.3
7.	Sikles UCO	Gurung	34.77

Source: https://censusnepal.cbs.gov.np/

3.5 Bio-physical Settings

In ACA, barren land dominates at 49.7%, followed by grassland at 21.3%. Freshwater rivers and lakes are sparse, covering only 0.2% of the area, mainly in Manang and Lo-Manthang. Shrubland covers 4% and is prominent in Manang and Jomsom. Sparse agriculture occupies 3.1% of the land, with higher concentrations in Ghandruk and Bhujung. Northern UCOs are food-deficient and exhibit transhumant characteristics.

Table 3: Land use types in ACA

SN	Land Use Type	Proportion
1	Forest	15.2
2	Shrubland	4
3	Grassland	21.3
4	Agriculture	3.1
5	Barren	49.7
6	Sand Gravel	1.7
7	Snow Cover	0.5
8	Glacier	4.4
9	River	0.1
10	Lake/Pond	0.1

3.6 Phyto-Geographic Characters

ACA spans high mountain eco-zones within the valleys of the Marsyangdi and Kali Gandaki Rivers, encompassing the dry alpine forests of Mustang, the valleys and foothills of Pokhara to the south, and the Nepal-China international border to the north. It features notable geographical landmarks, including the world's deepest river gorge (the Kali Gandaki Gorge), the world's largest rhododendron forest, and the world's highest altitude freshwater Tilicho Lake. Serving as a convergence point between the eastern and western Himalayas, ACA's Kali Gandaki River Valley acts as a significant ecological divide, influencing the distribution of plant and bird species characteristic of both the

eastern and western Himalayan regions, as well as the Tibetan-Gangetic regions. ACA encompasses diverse habitats ranging from subtropical Sal forests to perennial snow.

ACA stands as the sole protected area in Nepal encompassing four physiographic regions and six climatic zones, fostering 29 ecosystem types and 22 forest types (Tiruwa et al., 2021). This diverse landscape supports a rich biodiversity, hosting 1884 vascular plants and 1102 animals (Tiruwa et al., 2024). ACA is home to over 60.38% of Nepal's mammalian species, 58.18% of bird species, over 33% of reptiles, about 20% of amphibians, 10.98% of fish species and 51.73% of butterfly species. Additionally, ACA boasts over 430 plant species, with over 200 utilized for domestic purposes and 18 commercially valuable species among them.

Due to the preservation efforts led by the National Trust for NTNC-ACAP boasts a rich stock of NTFPs. Harnessing these products sustainably and judiciously at a commercial level holds the key to promoting sustainable livelihoods and resource productivity. NTFPs serve as integral components of indigenous culture, offering essential healthcare to millions and carrying significant cultural value. However, threats such as overexploitation, premature harvesting, and illegal logging pose challenges to the sustainable management of these resources.

3.7 NTFP's Inventory

The latest inventory has revealed the presence of 345 species of NTFPs in ACA (refer to Annex 5). The species richness of NTFP is notably higher in the CAMCs of Bhujung, Sikles, and Manang UCOs, while it is comparatively lower in the CAMCs of Lomanthang and Ghandruk UCOs (refer to Figure 7).

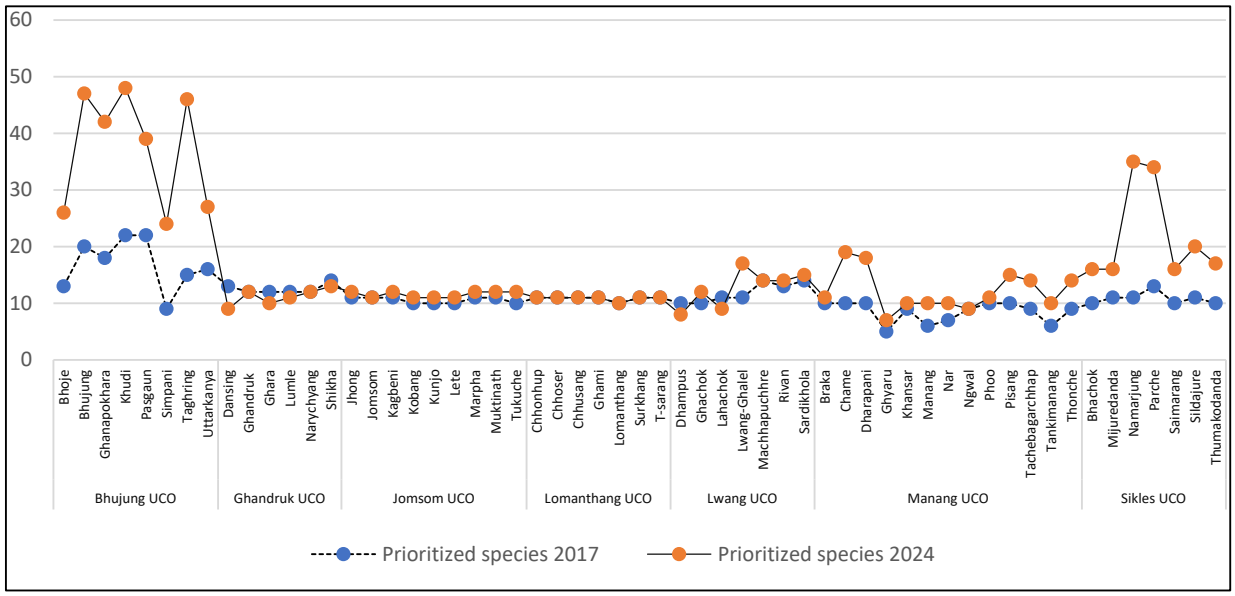


Figure 9: Comparative study of number of prioritized NTFPs species in between 2017 and 2024

3.8 Prioritized NTFPs

Within the CAMCs of ACA, 84 NTFPs were identified as priorities (refer to Annex 6). They were prioritized mainly by the preference of local people, based on their local/domestic use and commercial value. Of 84 prioritized species of NTFPs, a total of 1,005.8 metric ton fresh weight amount has been estimated to sustainably harvest. The majority of socially prioritized NTFPs are found in Bhujung UCO (51), followed by Sikles UCO (33), and Manang UCO (29) respectively (see Figure 8). Notably, Yarshagumba (*Ophiocordyceps sinensis*), Kutki (*Neopicrorhiza scrophulariiflora*), Nirmasi (*Delphinium denudatum),* Satuwa (*Paris polyphylla*), and Padamchal (*Rheum australe*) are the most sought-after NTFPs in 61.40%, 59.64%, 57.89%, 50.87% and 49.12% of CAMCs, respectively**. More than half (58.82%) of the prioritized species are used for local consumption, while 28.23% serve both local and commercial purposes, and 24.71% are**

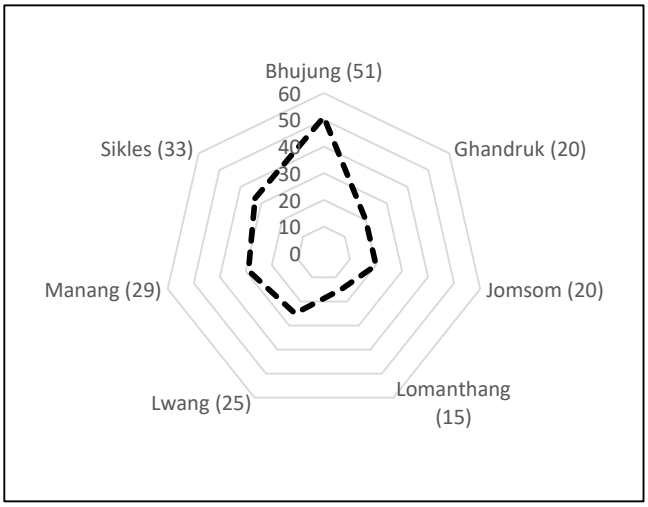


Figure 10: Number of prioritized NTFPs in UCOs of ACA

solely utilized for commercial purposes. Yarshagumba and Kutki are particularly favored in the CAMCs of ACA, preferred by 61.40% (n = 35) and 59.64% (n = 34) of existing CAMCs, respectively (see Table 4).

Table 4: Ten most preferred NTFPs by the CAMC of ACA

SN	Scientific names	Local name	Preferred by CAMC (%)
1	*Ophiocordyceps sinensis*	Yarshagumba	61.40%
2	*Neopicrorhiza scrophulariiflora*	Kutki	59.64%
3	*Delphinium denudatum*	Nirmasi	57.89%
4	*Paris polyphylla*	Satuwa	50.87%
5	*Rheum austral*	Padamchal	49.12%
6	*Rhododendron anthopogon*	Sunpati	49.12%
7	*Girardinia diversifolia*	Allo	47.37%
8	*Swertia chirayita*	Chiraito	47.36%
9	*Asparagus racemosus*	Kurilo	43.85%
10	*Daphne bholua*	Lokta	40.35%

3.9 Assessment of prioritized NTFPs

3.9.1 Bhujung UCO

Bhujung, the smallest UCO representing the Lamjung district of Nepal, covers 4.74% (36,165 hectares) of the ACA. The Bhujung UCO includes eight CAMCs: Bhoje, Bhujung, Ghanpokhara, Khudi, Pasgaun, Simpani, Tadharing, and Uttarkanya, which span various climatic zones from tropical to nival. This study are being fired 96 plant species within this UCO that have NTFPs value, with 51 of these NTFPs being prioritized by the local community.

Table 5: Prioritized NTFPs of Bhujung UCO with harvesting protocols

S.N.	Species	Scientific Name	CAMC	Frequency	Harvesting Protocol
1	Allo	*Girardinia diversifolia*	8	100	Collect bark from 2 yrs. or more matured plants after releasing seeds in October-November. 3 years rotation and reserve at least 25% production and area for regeneration are recommended.
2	Amala	*Phyllanthus emblica*	8	100	Avoid mechanical harvesting, Pick the fruits using hand or thrash with a stick without damaging the branches. Avoid lopping/cutting of fruit branches during fruit collection. Maximum allowable harvest quantity 90% of fruits. Harvest mature ripe fruits before dissemination.
3	Rato Chyaau	*Laetiporus sulphureus*	8	100	Collect only matured plants only. Collect 85% of the population
4	Gurjo	*Tinospora cordifolia*	8	100	Collect mature plant materials (seeds are fully formed, matured, dried and disseminated.) Collect optimum 85% of the population. Rational harvesting ensuring sustainable production.
5	Indreni	*Trichosanthes tricuspidate*	8	100	Avoid mechanical harvesting, Pick the fruits using hand or thrash with a stick without damaging the branches. Avoid lopping/cutting of fruiting branches during fruit collection. Maximum allowable harvest quantity 90% of fruits. Harvest mature ripe fruits before dissemination.
6	Kafal	*Myrica esculenta*	8	100	Avoid mechanical harvesting, Pick the fruits using hand or thrashed with a stick without damaging the branches. Avoid lopping/cutting of fruiting branches during

S.N.	Species	Scientific Name	CAMC	Frequency	Harvesting Protocol
					fruit collection. Maximum allowable harvest quantity 90% of fruits. Harvest mature ripe fruits before dissemination.
7	Kaulo	*Machilus odoratissima*	8	100	Harvest leaves with small twigs using sharp sickle care mother plant to survive. Collect optimum 75% of the population.
8	Majitho	*Rubia manjith*	8	100	Collect mature plant materials (seeds are fully formed, matured, dried and disseminated.) Collect optimum 85% of the population. Rational harvesting ensuring sustainable production.
9	Kurilo	*Asparagus racemosus*	8	100	Harvest leaves with small twigs using sharp sickle care mother plant to survive. Collect optimum 75% of the population.
10	Niguro	*Diplazium maximum*	8	100	Harvest leaves with small twigs using sharp sickle care mother plant to survive. Collect optimum 75% of the population.
11	Pakhanbed	*Bergenia ciliata*	8	100	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
12	Pipla	*Piper mullesua*	8	100	Avoid mechanical harvesting, Pick the fruits using hand or thrashed with a stick without damaging the branches. Avoid lopping/cutting of fruiting branches during fruit collection. Maximum allowable harvest quantity 90% of fruits. Harvest mature ripe fruits before dissemination.
13	Siltimur	*Lindera neesiana*	8	100	Avoid mechanical harvesting, Pick the fruits using hand or thrashed with a stick without damaging the branches. Avoid lopping/cutting of fruiting branches during fruit collection. Maximum allowable harvest quantity 90% of fruits. Harvest mature ripe fruits before dissemination.

S.N.	Species	Scientific Name	CAMC	Frequency	Harvesting Protocol
14	Sisnu	*Urtica dioica*	8	100	Collect bark from 2 yrs. or more matured plants after releasing seeds in October-November. 3 years rotation and reserve at least 25% production and area for regeneration are recommended.
15	Tejpat	*Cinnamomum tamala*	8	100	**Bark:** Avoid mechanical harvesting; collect bark using sharp knife and peel of the bark along tree trunk. Strict to make wound size- 20cm wide* 80 cm long* 1 cm deep and > 30 cm spaces between wounds. Extract the bark from one third (33%) o\proportion of tree trunk. **Leaves:** Avoid mechanical harvesting; harvest leaves with small twigs using sharp sickle care mother plant to survive. Collect optimum 80% of leaves. Avoid lopping/cutting of trees and branches during leaf collection."
16	Timur	*Zanthoxylum armatum*	8	100	Avoid mechanical harvesting, Pick the fruits using hand or thrashed with a stick without damaging the branches. Avoid lopping/cutting of fruiting branches during fruit collection. Maximum allowable harvest quantity 90% of fruits. Harvest mature ripe fruits before dissemination.
17	Titepati	*Artemisia indica*	8	100	Collect mature plant materials (seeds are fully formed, matured, dried and disseminated.) Collect optimum 85% of the population. Rational harvesting ensuring sustainable production.
18	Amriso	*Thysanolaena latifolia*	7	87.5	Avoid mechanical harvesting, collect the inflorescence using hand without damaging the mother plants. Rational harvesting ensuring sustainable production. Maximum allowable harvest quantity 90% of population.
19	Chiraito	*Swertia chirayita*	7	87.5	Collect mature plant materials (seeds are fully formed, matured, dried and disseminated.) Collect optimum 85% of the population. Rational harvesting ensuring sustainable production.
20	Chutro	*Berberis aristate*	7	87.5	Avoid mechanical harvesting; collect bark using sharp knife and peel of the bark along tree trunk. Strict to make wound size- 20cm wide* 80 cm long* 1 cm deep and > 30 cm spaces between wounds.Extract the bark from one third (33%) o\proportion of tree trunk.

S.N.	Species	Scientific Name	CAMC	Frequency	Harvesting Protocol
21	Lokta	*Daphne bholua*	7	87.5	Collect plant bark from the end of September or mid-October continuing into late spring to mid may (kartik to jestha) with two months break in the coldest months of mid-december to mid-february (Poush to Magh). Select only the plants of 10 cm or more circumference girth and 8-10 years or more aged stems for bark collection. Cut the matured stems at 15/30 cm above the ground for letting better coppicing and root system safe. collect optimum 75% of the population.
22	Nigalo	*Thamnocalamus spathiflorus*	7	87.5	Rational harvesting maintaining at least 5 plots. Reserve about 25% of harvesting area and production for sustainable regeneration. Harvest leaves with small twigs using sharp sickle care mother plant to survive. Harvest only matured and outer shoots of culm.
23	Tusa	*Drepanostachyum falcatum*	7	87.5	Rational harvesting maintaining at least 5 plots. Reserve about 25% of harvesting area and production for sustainable regeneration. Harvest leaves with small twigs using sharp sickle care mother plant to survive. Harvest only matured and outer shoots of culm.
24	Ban Tarul	*Dioscorea hamiltonii*	6	75	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
25	Guyeli	*Elaeagnus umbellate*	6	75	Avoid mechanical harvesting, Pick the fruits using hand or thrashed with a stick without damaging the branches. Avoid lopping/cutting of fruiting branches during fruit collection. Maximum allowable harvest quantity 90% of fruits. Harvest mature ripe fruits before dissemination.
26	Nagbeli	*Lycopodium clavatum*	6	75	Collect mature plant materials (seeds are fully formed, matured, dried and disseminated.) Collect optimum 85% of the population. Rational harvesting ensuring sustainable production.
27	Satuwa	*Paris polyphylla*	6	75	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling

S.N.	Species	Scientific Name	CAMC	Frequency	Harvesting Protocol
					part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
28	Kakoli (Ban Lasun)	*Fritillaria cirrohosa*	5	62.5	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
29	Bikh	*Aconitum spicatum*	5	62.5	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
30	Jatamansi	*Nardostachys jatamansi*	5	62.5	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
31	Khiraunla	*Polygonatum cirrhifolium*	5	62.5	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
32	Kutki	*Neopicrorhiza scrophulariiflora*	5	62.5	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
33	Lauth Salla	*Taxus wallichiana*	5	62.5	Avoid mechanical harvesting; collect bark using sharp knife and peel of the bark along tree trunk. Strict to make wound size- 20cm wide* 80 cm long* 1 cm deep and > 30 cm spaces between wounds. Extract the bark from one third (33%) proportion of tree trunk.
34	Nirmasi	*Delphinium denudatum*	5	62.5	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling

S.N.	Species	Scientific Name	CAMC	Frequency	Harvesting Protocol
					part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
35	Padamchal	*Rheum austral*	5	62.5	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only
36	Panchaule	*Dactylorhiza hatagirea*	5	62.5	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
37	Sunpati	*Rhododendron anthopogon*	5	62.5	Avoid mechanical harvesting. A maximum of 90% of flowers are allowed to be harvested.
38	Yarshagumba	*Ophiocordyceps sinensis*	5	62.5	Harvest from May to July. Pick manually by using pointed mechanical tool (like chuche kuto) which disperse minimal soil while digging. Collect only matured stalk. Reserve about 10% of the production area for sustainable regeneration.
39	Dhakayo	*Arisaema griffithii*	4	50	Harvest leaves with small twigs using sharp sickle care mother plant to survive. Collect optimum 75% of the population.
40	Dhatelo	*Prinsepia utilis*	4	50	Avoid mechanical harvesting, Pick the fruits using hand or thrashed with a stick without damaging the branches. Avoid lopping/cutting of fruiting branches during fruit collection. Maximum allowable harvest quantity 90% of fruits. Harvest mature ripe fruits before dissemination.
41	Jhyau	*Lichen sp*	4	50	Collect mature plant materials (seeds are fully formed, matured, dried and disseminated.) Collect optimum 85% of the population. Rational harvesting ensuring sustainable production.
42	Sugandhawal	*Valeriana jatamansi*	4	50	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling

S.N.	Species	Scientific Name	CAMC	Frequency	Harvesting Protocol
					part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
43	Talis Patra	*Abies spectabilis*	4	50	Avoid mechanical harvesting; harvest leaves with small twigs using sharp sickle care mother plant to survive. Collect optimum 80% of leaves. Avoid lopping/cutting of trees and branches during leaf collection.
44	Ainselu	*Rubus ellipticus*	3	37.5	Avoid mechanical harvesting, Pick the fruits using hand or thrashed with a stick without damaging the branches. Avoid lopping/cutting of fruiting branches during fruit collection. Maximum allowable harvest quantity 90% of fruits. Harvest mature ripe fruits before dissemination.
45	Thulo Okhati	*Astilbe rivularis*	3	37.5	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
46	Tin pate satuwa/ Lek satuwa	*Trillium govanianum*	3	37.5	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only
47	Dhupi	*Juniperus indica*	2	25	Avoid mechanical harvesting; harvest leaves with small twigs using sharp sickle care mother plant to survive. Collect optimum 80% of leaves. Avoid lopping/cutting of trees and branches during leaf collection.
48	Bhutkesh	*Selinum wallichianum*	1	12.5	
49	Chiple	*Boehmeria sp*	1	12.5	Avoid mechanical harvesting; collect bark using sharp knife and peel of the bark along tree trunk. Strict to make wound size- 20cm wide* 80 cm long* 1 cm deep

S.N.	Species	Scientific Name	CAMC	Frequency	Harvesting Protocol
					and > 30 cm spaces between wounds. Extract the bark from one third (33%) proportion of tree trunk.
50	Gujargano	*Cissampelos pareira*	1	12.5	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
51	Lapsi	*Choerospondias axillaris*	1	12.5	Avoid mechanical harvesting, Pick the fruits using hand or thrashed with a stick without damaging the branches. Avoid lopping/cutting of fruiting branches during fruit collection. Maximum allowable harvest quantity 90% of fruits. Harvest mature ripe fruits before dissemination.

3.9.9.1 Bhoje CAMC (Bhujung UCO)

Area: 1330 ha (3.6% of UCO, 0.2% of ACA)

Potential NTFPs: Pipla, Tusa, Nigalo, Lokta, Siltimur, Kaaulo, Kafal, Tejpat, Timur, Titepati, Chutro, Niguro, Gurjo, Indreni, Allo, Amriso, Majitho, Sisnu, Kurilo, Chiraito, Chyau, Naagbeli, Pakhanbed, Satuwa, Amala

a) Ecological assessment

In the forest area of Bhoje CAMC, locally preferred NTFPs Kaaulo (IVI=130.74), and Tejpat (IVI=123.05) are found in the canopy layer. Ecological dominance of major NTFPs is available in the understory and ground vegetation of this CAMC. Locally preferred NTFPs such as Tusa (PV= 6.18) are more prominent in the understory layer followed by lokta (PV=5). In the ground vegetation, higher prominence of Pipla (PV= 4.48), Titepati (PV= 4.25), Niguro (PV=3.75), Allo (PV=2.65), Amriso (PV=1.76), Majitho (PV=1.76) and Sisnu (PV=1.76) are recorded.

Table 6: Dominance and prominence of potential plant based NTFPs in Bhoje CAMC

Tree					
Species	**Scientific name**	**RF**	**RD**	**RDO**	**IVI**
Kaulo	*Machilus duthiei*	30	42.85	57.89	130.74
Tejpat	*Cinnamomum tamala*	50	42.85	30.19	123.05
Kafal	*Myrica esculenta*	10	7.14	7.62	24.76
Amala	*Phyllanthus emblica*	10	7.14	4.28	21.43
Shrub					
Species	Scientific name	Frequency		PV	
Tusa	*Drepanostachyum falcatum*	0.12		6.18	
Lokta	*Daphne bholua*	0.06		5	
Herb					
Species	Scientific name	Frequency		PV	
Pipla	*Piper mullesua*	0.3		4.48	
Titepati	*Artemisia indica*	0.25		4.25	

Niguro	*Diplazium maximum*	0.25	3.75
Allo	*Girardinia diversifolia*	0.12	2.65
Amriso	*Thysanolaena latifolia*	0.12	1.76
Majitho	*Rubia manjith*	0.12	1.76
Sisnu	*Urtica dioica*	0.12	1.75

b) Prioritized species and productivity

Pipla, Tusa, Nigalo, Lokta, Siltimur, Kaaulo, Kafal, Tejpat, Timur, Titepati, Chutro, Niguro, Gurjo, Indreni, Allo, Amriso, Majitho, Sisnu, Kurilo, Chiraito, Chyau, Naagbeli, Pakhanbed, Satuwa, Amala are most Prioritized plant based NTFPs by the local community of Bhoje CAMC. Regarding production, all Prioritized species except Chiraito have harvestable quantities in this CAMC.

Table 7: Prioritized NTFPs with their habitat and production potential in Bhoje CAMC

S.N.	Local Name	Scientific Name	Potential habitat area (ha)	Wt/plant (gm)	Wt/ha (Kg)	Sustainable amount to harvest (kg/ha)
1	Pipla	*Piper Mullesua*	406.25	45	15.7	14.13
2	Nigalo	*Thamnocalamus spathiflorus*	162.5	130	19.4	14.55
3	Tusa	*Drepanostachyum falcatum*	162.5	60	11.9	8.925
4	Lokta	*Daphne bholua*	81.25	55	5.5	4.125
5	Siltimur	*Lindera neesiana*	81.25	1200	59.7	53.73
6	Timur	*Zanthoxylum armatum*	81.25	800	39.8	35.82
7	Titepati	*Artemisia indica*	406.25	85	265.6	225.76
8	Chutro	*Berberis aristata*	81.25	195	9.7	3.201
9	Niguro	*Diplazium maximum*	325	14	78.8	59.1
10	Gurjo	*Tinospora cordifolia*	162.5	1900	189	132.3
11	Indreni	*Trichosanthes tricuspidata*	81.25	100	5	4.5
12	Allo	*Girardinia diversifolia*	162.5	64	120	90
13	Amriso	*Thysanolaena maxima*	162.5	50.5	94.7	85.23
14	Majitho	*Rubia manjith*	162.5	73.4	91.8	64.26
15	Sisnu	*Urtica dioica*	162.5	70	131.3	98.475
16	Kurilo	*Asparagus racemosus*	162.5	20	25	18.75

17	Chiraito	*Swertia chirayita*	81.25	5	3.1	2.635
18	Rato Chyaau	*Laetiporus sulphureus*	81.25	45	28.1	23.885
19	Nagbeli	*Lycopodium clavatum*	81.25	95	59.4	50.49
20	Pakhanbed	*Bergenia ciliata*	81.25	25	15.6	10.92
21	Satuwa	*Paris polyphylla*	81.25	14	8.8	6.16
22	Kaulo	*Machilus odoratissima*	243.75	9500	113.4	37.42
23	Tejpat Leaves	*Cinnamomum tamala*	406.25	10000	119.4	95.52
24	Tejpat Bark	*Cinnamomum tamala*	406.25	1000	11.9	3.92
25	Kafal	*Myrica esculenta*	81.25	4500	8.9	8.01
26	Amala	*Phyllanthus emblica*	81.25	5000	9.9	8.91

a) 3.9.1.2 Bhujung CAMC (Bhujung UCO)

Area: 7080 ha (19.6% of UCO, 0.9% of ACA)

Potential NTFPs: Pipla, Tusa, Nigalo, Lokta, Siltimur, Kaaulo, Kafal, Tejpat, Timur, Titepati, Chutro, Niguro, Gurjo, Indreni, Allo, Amriso, Majitho, Sisnu, Kurilo, Chiraito, Chyau, Naagbeli, Pakhanbed, Satuwa, Amala, Yarshagumba, Bikh, Kutki, Sugandhawal, Thulo okhati, Guyeli, Sunpati, Panchaule, Dhakayo, Ban lasun, Khiraula, Jhayu, Nirmasi, Bhutkesh, Padamchal, Lauth salla, Dhupi, Dhatelo, Indreni, Jatamansi, jhyau, Talis patra.

b) Ecological assessment

In the forest area of Bhujung CAMC, locally preferred NTFPs Lauth salla (IVI=96.7), and Tejpat (IVI=69.91) are found in the canopy layer. Ecological dominance of major NTFPs is available in the understory and ground vegetation of this CAMC. Locally preferred NTFPs such as Tusa (PV= 12.43) and Lokta (PV=8.8) are more prominent in the understory layer followed by Chutro (PV=8.3). In the ground vegetation, higher prominence of Kurilo (PV=2.63), Titepati (pv=2.63), Niguro (PV= 2.34), Gurjo (PV=2.15), Satuwa (PV=2.11) and Allo (PV=1.65) are recorded.

Table 8: Dominance and prominence of potential plant based NTFPs in Bhujung CAMC

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Lauth Salla	*Taxus wallichiana*	28	26.9	41.8	96.7
Tejpat	*Cinnamomum tamala*	12	34.61	23.3	69.91
Kafal	*Myrica esculenta*	3.9	15.38	12.7	31.98
Dhupi	*Juniperus indica*	7.9	7.69	10.8	26.39
Talis patra	*Abies spectabilis*	7.9	7.69	9.2	24.79
Shrub					
Species	**Scientific Name**	**Frequency**		**PV**	
Tusa	*Drepanostachyum falcatum*	0.37		12.43	

Lokta	*Daphne bholua*	0.27	8.8
Chutro	*Berberis aristata*	0.24	8.3
Herb			
Species	**Scientific Name**	**Frequency**	**PV**
Kurilo	*Asparagus racemosus*	0.03	2.63
Titepati	*Artemisia indica*	0.03	2.63
Niguro	*Diplazium maximum*	0.12	2.34
Gurjo	*Tinospora cordifolia*	0.02	2.15
Satuwa	*Paris polyphylla*	0.12	2.11
Allo	*Girardinia diversifolia*	0.06	1.65

c) Prioritized Species and productivity

Pipla, Tusa, Nigalo, Lokta, Siltimur, Kaaulo, Kafal, Tejpat, Timur, Titepati, Chutro, Niguro, Gurjo, Indreni, Allo, Amriso, Majitho, Sisnu, Kurilo, Chiraito, Chyau, Naagbeli, Pakhanbed, Satuwa, Amala, Yarshagumba, Bikh, Kutki, Sugandhawal, Thulo okhati, Guyeli, Sunpati, Panchaule, Dhakayo, Ban lasun, Khiraula, Jhayu, Nirmasi, Bhutkesh, Padamchal, Lauth salla, Dhupi, Dhatelo, Indreni, Jatamansi, jhyau, Talis patra are most Prioritized plant based NTFPs by the local community of Bhujung CAMC.

Table 9: Prioritized NTFPs with their habitat and production potential in Bhujung CAMC

SN	Local name	Scientific name	Potential habitat area (ha)	Wt/Plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
1	Tusa	*Drepanostachyum falcatum*	2627.63	80	42	31.5
2	Nigalo	*Thamnocalamus spathiflorus*	2627.63	90	48.73	36.55
3	Lokta	*Daphne bholua*	1897.73	58	20.46	15.35
4	Chutro	*Berberis aristata*	1678.76	125	30.76	10.15
5	Pipla	*Piper mullesua*	510.93	40	28.86	25.97
6	Guyeli	*Elaeagnus umbellata*	218.97	2350	96.4	86.76
7	Siltimur	*Lindera neesiana*	218.97	1200	29.53	26.58
8	Timur	*Zanthoxylum armatum*	145.98	900	14.77	13.29
9	Dhatelo	*Prinsepia utilis*	291.96	140	8.04	7.24
10	Kurilo	*Asparagus racemosus*	218.97	15.5	28.76	21.57
11	Titepati	*Artemisia indica*	218.97	75	46.39	39.43
12	Niguro	*Diplazium maximum*	875.88	15	29.38	22.04
13	Gurjo	*Tinospora cordifolia*	145.98	80	1.31	0.92
14	Satuwa	*Paris polyphylla*	948.87	12	17.32	12.12
15	Allo	*Girardinia diversiflora*	437.94	64	52.78	39.59

SN	Local name	Scientific name	Potential habitat area (ha)	Wt/Plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
16	Sunpati	*Rhododendron anthopogon*	72.99	58	0.48	0.39
17	Indreni	*Trichosanthes tricuspidate*	145.98	100	1.64	1.48
18	Panchaule	*Dactylorhiza hatagirea*	583.92	4.3	3.55	2.49
19	Amriso	*Thysanolaena maxima*	145.98	40	8.25	7.43
20	Nagbeli	*Lycopodium clavatum*	510.93	80	98.97	84.12
21	Kakoli (Ban Lasun)	*Fritillaria cirrhosa*	437.94	2.3	1.4	0.98
22	Dhakayo	*Arisaema griffithii*	437.94	35	32.4	24.3
23	Chiraito	*Swertia chirayita*	364.95	12	7.42	6.31
24	Jatamansi	*Nardostachys jatamansi*	364.95	17.3	8.9	6.23
25	Sisnu	*Urtica dioica*	364.95	35	18.04	13.53
26	Thulo Okhati	*Astilbe rivularis*	145.98	40	8.24	5.77
27	Khiraula	*Polygonatum cirrhifolium*	291.96	35	14.43	10.1
28	Bikh	*Aconitum spicatum*	218.97	10	3.1	2.17
29	Jhyau	*Lichen sp*	218.97	6	3.09	2.63
30	Majitho	*Rubia manjith*	218.97	73	22.58	15.81
31	Nirmasi	*Delphinium denudatum*	218.97	12.3	3.8	2.66
32	Padamchal	*Rheum australe*	218.97	64.2	19.8	13.86
33	Bhutkesh	*Selenium wallichianum*	72.99	17.3	1.8	1.53
34	Rato Chyaau	*Laetiporus sulphureus*	72.99	9	5.56	4.73
35	Lek Satuwa / Tin Pate Satuwa	*Trillium govanianum*	72.99	7	0.72	0.5
36	Pakhanbed	*Bergenia ciliata*	72.99	37.5	3.86	2.7
37	Sugandhawaal	*Valeriana jatamansi*	72.99	20	2.06	1.44
38	Yarshagumba	*Ophiocordyceps sinensis*	72.99	5.5	0.06	0.054
39	Kutki	*Neopicrorhiza scrophulariifolia*	145.98	14.4	2.96	2.07
40	Lauth Salla	*Taxus wallichiana*	510.93	9500	21.82	7.2
41	Tejpat leaves	*Cinnamomum tamala*	218.97	9450	27.91	22.33
42	Tejpat Bark	*Cinnamomum tamala*	218.97	1500	4.43	1.46
43	Kafal	*Myrica esculenta*	72.99	5500	7.22	6.5
44	Dhupi	*Juniperus indica*	145.98	3095	2.03	1.62

SN	Local name	Scientific name	Potential habitat area (ha)	Wt/Plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
45	Talis Patra	*Abies spectabilis*	145.98	8400	5.51	4.4
46	Amala	*Phyllanthus emblica*	72.99	5000	4.92	4.43
47	Kaulo	*Machilus odoratissima*	72.99	10000	3.28	1.08

3.9.1.3 Ghanapokhara CAMC

Area: 5640 ha (15.6% of UCO, 0.7% of ACA)
Potential NTFPs: Pipla, Tusa, Nigalo, Lokta, Siltimur, Kaaulo, Kafal, Tejpat, Timur, Titepati, Chutro, Niguro, Gurjo, Indreni, Allo, Amriso, Majitho, Sisnu, Kurilo, Chiraito, Chyau, Naagbeli, Pakhanbed, Satuwa, Amala, Yarshagumba, Bikh, Kutki, Sugandhawal, Thulo okhati, Guyeli, Sunpati, Panchaule, Dhakayo, Ban lasun, Khiraula, Jhayu, Nirmasi, Bhutkesh, Padamchal, Lauth salla, Dhupi, Dhatelo, Indreni, Jatamansi, jhyau, Talis patra

a) Ecological assessment

In the forest area of Ghanapokhara CAMC, locally preferred NTFPs Lauth salla (IVI=96.7), and Tejpat (IVI=69.91) are found in the canopy layer. Ecological dominance of major NTFPs is available in the understory and ground vegetation of this CAMC. Locally preferred NTFPs such as Tusa (PV= 6.75) and Lokta (PV=8.95) are more prominent in the understory layer followed by Chutro (PV=8.85). In the ground vegetation, higher prominence of Sisnu (PV=3), Kurilo (PV=2.5), Titepati (PV=3.33), Niguro (PV= 1.82), Amrsio (PV= 1.93) and Allo (PV=1.93) are recorded.

Table 10: Dominance and prominence of potential plant based NTFPs in Ghanapokhara CAMC

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Kafal	*Myrica esculenta*	18.74	17.64	10.33	46.71
Tejpat	*Cinnamomum tamala*	12.49	17.64	12.66	42.79
Lauth salla	*Taxus wallichiana*	12.49	11.76	17	41.25
Taalis patra	*Abies spectabilis*	12.49	11.76	14.76	39.01
Kaulo	*Machilus duthiei*	12.49	11.76	13.36	37.61
Shrub					
Species	Scientific Name	Frequency			PV
Lokta	*Daphne bholua*	0.22			8.95
Chutro	*Berberis aristata*	0.33			8.85
Tusa	*Drepanostachyum falcatum*	0.24			6.74
Timur	*Zanthoxylum armatum*	0.04			3.95
Herb					
Species	Scientific Name	Frequency			PV

Titepati	*Artemisia indica*	0.11	3.33
Sisnu	*Urtica dioica*	0.11	3
Kurilo	*Asparagus racemosus*	0.11	2.5
Amriso	*Thysanolaena maxima*	0.06	1.93
Allo	*Girardinia diversifolia*	0.06	1.93
Niguro	*Diplazium maximum*	0.13	1.82

b) Prioritized Species and productivity

Pipla, Tusa, Nigalo, Lokta, Siltimur, Kaaulo, Kafal, Tejpat, Timur, Titepati, Chutro, Niguro, Gurjo, Indreni, Allo, Amriso, Majitho, Sisnu, Kurilo, Chiraito, Chyau, Naagbeli, Pakhanbed, Satuwa, Amala, Yarshagumba, Bikh, Kutki, Thulo okhati, Guyeli, Sunpati, Panchaule, Dhakayo, Ban lasun, Khiraula, Jhayu, Nirmasi, Bhutkesh, Padamchal, Lauth salla, Dhupi, Dhatelo, Indreni, Jatamansi, jhyau, Talis patra are most Prioritized plant based NTFPs by the local community of Ghanpokhara CAMC.

Table 11: Prioritized NTFPs with their habitat and production potential in Ghanapokhara CAMC

S.N.	Local name	Scientific name	Potential habitat area (ha)	Wt/Plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
1	Lokta	*Daphne bholua*	1253.33	67	21.33	15.99
2	Chutro	*Breberis aristata*	1880	130	36.78	12.14
3	Tusa	*Drepanostachyum falcatum*	1378.67	80	22.64	16.98
4	Nigalo	*Thamnocalamus spathiflorus*	1378.67	120	33.95	25.46
5	Timur	*Zanthoxylum armatum*	250.67	2200	77.81	70.03
6	Pipla	*Piper mullesua*	376	55	3.89	3.5
7	Siltimur	*Lindera neesiana*	376	1200	63.66	57.29
8	Gurjo	*Tinospora cordifolia*	250.67	70	31.11	26.44
9	Titepati	*Artemisia indica*	626.67	35	38.89	33.06
10	Sunpati	*Rhododendron anthopogon*	250.67	58.5	2.07	1.66
11	Sisnu	*Urtica dioica*	626.67	70	77.78	58.34
12	Ban tarul	*Dioscorea hamiltonii*	125.33	1950	34.48	24.14
13	Kurilo	*Asparagus racemosus*	626.67	18	20	15
14	Amriso	*Thysanolaena maxima*	376	25	16.67	15

S.N.	Local name	Scientific name	Potential habitat area (ha)	Wt/Plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
15	Allo	*Girardinia diversiflora*	376	65	43.33	32.5
16	Niguro	*Diplazium maximum*	752	14	21.78	16.34
17	Panchaule	*Dactylorhiza hategirea*	752	4.3	5.7	3.99
18	Rato Chyaau	*Laetiporus sulphureus*	125.33	100	1.77	1.59
19	Kakoli (Ban lasun)	*Fritillaria cirrhosa*	376	6	4	2.8
20	Jhyau	*Lichen sps.*	376	5.5	3.67	3.11
21	Khiraula	*Polygonatum cirrhifolium*	376	35	23.3	16.31
22	Majitho	*Rubia manjith*	376	63	42	35.7
23	Nagbeli	*Lycopodium clavatum*	376	54.5	36.33	30.88
24	Satuwa	*Paris polyphylla*	376	9	6	4.2
25	Bikh	*Aconitum spicatum*	250.67	10	4.44	3.11
26	Chiraito	*Swertia chirayita*	250.67	16	7.11	6.04
27	Chyau	*Ganoderma lucidum*	250.67	10	4.44	3.77
28	Jatamansi	*Nardostachys jatamansi*	250.67	17.3	0	0
29	Nirmasi	*Delphinium denudatum*	250.67	15.3	6.8	4.76
30	Padamchal	*Rheum austral*	250.67	67.2	29.87	20.91
31	Dhakayo	*Arisaema griffithii*	125.33	45	10	7.5
32	Kutki	*Neopicrorhiza scrophulariifolia*	125.33	14.4	3.2	2.24
33	Pakhanbed	*Bergenia ciliata*	125.33	24.5	5.44	3.81
34	Yarshagumba	*Ophiocordyceps sinensis*	125.33	5.5	0.132	0.119
35	Kafal	*Myrica esculenta*	376	4500	9.55	8.6
36	Tejpat Bark	*Cinnamomum tamala*	250.6	1500	3.18	1.05
37	Tejpat leaves	*Cinnamomum tamala*	250.66	9950	21.11	16.88
38	Lauth salla	*Taxus wallichiana*	250.66	8450	11.95	3.94

S.N.	Local name	Scientific name	Potential habitat area (ha)	Wt/Plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
39	Talis patra	*Abies spectabilis*	250.66	7500	10.61	8.48
40	Kaulo	*Machilus odoratissima*	250.66	10000	14.15	4.67
41	Amala	*Phyllanthus emblica*	250.66	3050	4.31	3.88
42	Dhupi	*Juniperus indica*	125.33	3095	2.19	1.64

3.9.1.4 Khudi CAMC (Bhujung UCO)

Area: 10110ha (28% of UCO, 1.3% of ACA)
Potential NTFPs: Pipla, Tusa, Nigalo, Lokta, Siltimur, Kaaulo, Kafal, Tejpat, Timur, Titepati, Chutro, Niguro, Gurjo, Indreni, Allo, Amriso, Majitho, Sisnu, Kurilo, Chiraito, Chyau, Naagbeli, Pakhanbed, Satuwa, Amala, Yarshagumba, Bikh, Kutki, Sugandhawal, Thulo okhati, Guyeli, Sunpati, Panchaule, Dhakayo, Ban lasun, Khiraula, Jhayu, Nirmasi, Bhutkesh, Padamchal, Lauth salla, Dhupi, Dhatelo, Indreni, Jatamansi, jhyau, Talis patra.

a) Ecological assessment

In the forest area of Khudi CAMC, locally preferred NTFPs Lauth salla (IVI=83), and Tejpat (IVI=38.2) are found in the canopy layer. Ecological dominance of major NTFPs is available in the understory and ground vegetation of this CAMC. Locally preferred NTFPs such as Lokta (PV= 11.91) and chutro (PV=10.49) are more prominent in the understory layer followed by Tusa (PV=8.75). In the ground vegetation, higher prominence of Titepati (PV=3.3), Kurilo (PV=2.74), Niguro (PV= 2.37 Allo (PV=2.14) and sisnu (PV=1.82) are recorded.

Table 12: Dominance and prominence of potential plant based NTFPs in Khudi CAMC

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Lauth Salla	*Taxus wallichiana*	25	24.5	33.5	83
Tejpat	*Cinnamomum tamala*	11.5	11.3	15.4	38.2
Amala	*Phyllanthus emblica*	7.7	11.3	16.4	35.4
Kaulo	*Machilus duthiei*	13.4	13.2	8.2	34.8
Kafal	*Myrica esculenta*	9.6	9.4	13.6	32.6
Shrub					
Species	**Scientific Name**	**Frequency**			**PV**
Lokta	*Daphne bholua*	0.44			11.91
Chutro	*Berberis aristata*	0.36			10.49
Tusa	*Drepanostachyum falcatum*	0.23			8.75
Timur	*Zanthoxylum armatum*	0.06			4.65

Herb			
Species	**Scientific Name**	**Frequency**	**PV**
Titepati	*Artemisia indica*	0.26	3.3
Kurilo	*Asparagus racemosus*	0.27	2.74
Niguro	*Diplazium maximum*	0.11	2.37
Allo	*Girardinia diversifolia*	0.04	2.14
Sisnoo	*Urtica dioica*	0.08	1.82

b) Prioritized species and productivity

Pipla, Tusa, Nigalo, Lokta, Siltimur, Kaaulo, Kafal, Tejpat, Timur, Titepati, Chutro, Niguro, Gurjo, Indreni, Allo, Amriso, Majitho, Sisnu, Kurilo, Chiraito, Chyau, Naagbeli, Pakhanbed, Satuwa, Amala, Yarshagumba, Bikh, Kutki, Sugandhawal, Thulo okhati, Guyeli, Sunpati, Panchaule, Dhakayo, Ban lasun, Khiraula, Jhayu, Nirmasi, Bhutkesh, Padamchal, Lauth salla, Dhupi, Dhatelo, Indreni, Jatamansi, jhyau, Talis patra are most Prioritized plant based NTFPs by the local community of Khudi CAMC.

Table 13: Prioritized NTFPs with their habitat and production potentials in Khudi CAMC

SN	Local name	Scientific name	Potential habitat area (ha)	Wt/Plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
1	Lokta	*Daphne bholua*	4415.86	58	29.71	22.28
2	Chutro	*Berberis aristata*	3602.41	135	39.51	13.04
3	Tusa	*Drepanostachyum falcatum*	2324.14	120	26.34	19.76
4	Nigalo	*Thamnocalamus spathiflorus*	2324.14	120	26.34	19.76
5	Timur	*Zanthoxylum armatum*	581.03	800	51.22	46.1
6	Ban Tarul	*Dioscorea hamiltonii*	1045.86	1950	160.53	112.37
7	Dhatelo	*Prinsepia utilis*	929.66	90	6.59	5.93
8	Guyeli	*Elaeagnus umbellate*	464.83	1200	43.9	39.51
9	Titepati	*Artemisia indica*	2672.76	30	82.76	70.35
10	Pipla	*Piper mullesua*	348.62	170	9.33	8.4
11	Kurilo	*Asparagus racemosus*	2788.97	40	110.34	82.76
12	Siltimur	*Lindera neesiana*	232.41	1200	21.95	19.76
13	Ainselu	*Rubus ellipticus*	813.45	180	14.82	13.34
14	Niguro	*Diplazium maximum*	1162.07	15	24.14	18.11
15	Allo	*Girardinia diversiflolia*	464.83	90	62.07	46.55
16	Nagbeli	*Lycopodium clavatum*	1510.69	30	48.28	41.04
17	Amriso	*Thysanolaena maxima*	464.83	35	16.09	14.48
18	Sisno	*Urtica dioica*	813.45	70	88.51	66.38

SN	Local name	Scientific name	Potential habitat area (ha)	Wt/Plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
19	Indreni	*Trichosanthes tricuspidata*	116.21	100	3.66	3.29
20	Chiraito	*Swertia chirayita*	813.45	8	6.44	5.15
21	Khiraula	*Polygonatum cirrhifolium*	697.24	14.5	10	7
22	Rato Chyaau	*Laetiporus sulphureus*	464.83	12	5.52	4.69
23	Majitho	*Rubia manjith*	464.83	80	45.98	39.08
24	Pakhanbed	*Bergenia ciliata*	348.62	12.5	7.18	5.03
25	Satuwa	*Paris polyphylla*	348.62	10	3.45	2.42
26	Gurjo	*Tinospora cordifolia*	232.41	120	27.59	23.45
27	Thulo Okhati	*Astilbe rivularis*	232.41	18	4.14	2.9
28	Kakoli (Ban Lasun)	*Fritillaria cirrhosa*	116.21	10.5	1.21	0.85
29	Bikh	*Aconitum spicatum*	116.21	10	1.15	0.81
30	Dhakayo	*Arisaema griffithii*	116.21	80	9.2	6.9
31	Jatamasi	*Nardostachys jatamansi*	116.21	15.5	1.78	1.25
32	Jhyau	*Lichen sp*	116.21	6	0.69	0.58
33	Kutki	*Neopicrorhiza scrophulariifolia*	116.21	14.4	1.66	1.16
34	Nirmasi	*Delphinium denudatum*	116.21	15.5	1.78	1.25
35	Padamchaal	*Rheum austral*	116.21	67.5	7.76	5.43
36	Panchaule	*Dactylorhiza hatagirea*	116.21	4.3	0.5	0.35
37	Sugandhawal	*Valeriana jatamansi*	116.21	20	2.3	1.6
38	Sunpati	*Rhododendron anthopogon*	116.21	58.5	0.54	0.41
39	Tin paate Satuwan / Lek Satuwa	*Trillidium govanianum*	116.21	10	1.15	0.81
40	Yarshagumba	*Ophiocordyceps sinensis*	116.21	5.5	0.143	0.129
41	Lauth Salla	*Taxus wallichiana*	1510.69	8500	40.43	13.34
42	Tejpat Bark	*Cinnamomum tamala*		1500	3.29	1.09
43	Tejpat Leaves	*Cinnamomum tamala*	697.24	10000	21.95	17.56
44	Amala	*Phyllanthus emblica*	464.83	5500	12.07	10.86

SN	Local name	Scientific name	Potential habitat area (ha)	Wt/Plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
45	Chiple Kaulo	*Machilus duthiei*	813.45	9500	24.33	8.03
46	Kafal	*Myrica esculenta*	581.03	3500	6.4	5.76
47	Talis Patra	*Abies spectabilis*	232.41	8400	6.15	5.2
48	Chiple	*Boehmeria sp*	116.21	8500	3.11	1.03

3.9.1.5 Pasgaun CAMC

Area: 2550 ha (7.1% of UCO, 0.3 % of ACA)
Potential NTFPs: Pipla, Tusa, Nigalo, Lokta, Siltimur, Kaaulo, Kafal, Tejpat, Timur, Titepati, Chutro, Niguro, Gurjo, Indreni, Allo, Amriso, Majitho, Sisnu, Kurilo, Chiraito, Chyau, Naagbeli, Pakhanbed, Satuwa, Amala, Yarshagumba, Bikh, Kutki, Sugandhawal, Thulo okhati, Guyeli, Sunpati, Panchaule, Dhakayo, Ban lasun, Khiraula, Jhayu, Nirmasi, Bhutkesh, Padamchal, Lauth salla, Dhupi, Dhatelo, Indreni, Jatamansi, jhyau, Talis patra.

a) Ecological assessment

In the forest area of Pasgaun CAMC, locally preferred NTFPs Lauth salla (IVI=98.58), Kaulo (IVI= 52.43) and Tejpat (IVI=44.69) are found in the canopy layer. Ecological dominance of major NTFPs is available in the understory and ground vegetation of this CAMC. Locally preferred NTFPs such as Lokta (PV= 10.76) and chutro (PV=10.73) are more prominent in the understory layer followed by Tusa (PV=6.89). In the ground vegetation, higher prominence of Pipla (PV= 5.06), Niguro (PV= 3.44), Allo (PV=2.34),Titepati (PV=1.81), Kurilo (PV=1.62), and sisnu (PV=1.62) are recorded.

Table 14: Dominance and prominence of potential plant based NTFPs in Pasgaun CAMC

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Lauth Salla	*Taxus wallichiana*	26.3	26.32	45.96	98.58
Kaaulo	*Machilus duthiei*	15.7	15.78	20.95	52.43
Tejpat	*Cinnamomum tamala*	15.7	15.78	13.21	44.69
Kafal	*Myrica esculenta*	5.26	5.26	5.08	15.6
Amala	*Phyllanthus emblica*	5.26	5.26	2.66	13.18
Shrub					
Species	**Scientific Name**	**Frequency**			**PV**
Lokta	*Daphne bholua*	0.28			10.76
Chutro	*Berberis aristata*	0.36			10.73
Tusa	*Drepanostachyum falcatum*	0.13			6.89
Siltimur	*Lindera neesiana*	0.07			5.6
Herb					
Species	**Scientific Name**	**Frequency**			**PV**

Pipla	*Piper mullesua*	0.42	**5.06**
Niguro	*Diplazium maximum*	0.2	3.44
Allo	*Girardinia diversifolia*	0.1	2.34
Titepati	*Artemisia indica*	0.13	1.81
Kurilo	*Asparagus racemosus*	0.1	1.62
Sisnu	*Urtica dioica*	0.1	1.62

b) Prioritized species and productivity

Pipla, Tusa, Nigalo, Lokta, Siltimur, Kaaulo, Kafal, Tejpat, Timur, Titepati, Chutro, Niguro, Gurjo, Indreni, Allo, Amriso, Majitho, Sisnu, Kurilo, Chiraito, Chyau, Naagbeli, Pakhanbed, Satuwa, Amala, Yarshagumba, Bikh, Kutki, Sugandhawal, Thulo okhati, Guyeli, Sunpati, Panchaule, Dhakayo, Ban lasun, Khiraula, Jhayu, Nirmasi, Bhutkesh, Padamchal, Lauth salla, Dhupi, Dhatelo, Indreni, Jatamansi, jhyau, Talis patra are most Prioritized plant based NTFPs by the local community of Pasgaun CAMC.

Table 15: Prioritized NTFPs with their habitat and production potential in Pasgaun CAMC

SN	Local name	Scientific name	Potential habitat area (ha)	Wt/Plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
1	Pipla	*Piper mullesua*	1073.68	45	16.02	14.42
2	Lokta	*Daphne bholua*	738.16	65	17.7	13.28
3	Chutro	*Berberis aristata*	939.47	125	36.65	12.09
4	Nigalo	*Thamnocalamus spathiflorus*	335.53	120	17.59	13.19
5	Tusa	*Drepanostachyum falcatum*	335.53	110	16.12	12.09
6	Siltimur	*Lindera neesiana*	201.32	250	15.71	14.14
7	Timur	*Zanthoxylum armatum*	134.21	800	33.51	30.16
8	Niguro	*Diplazium maximum*	536.84	15	82.89	62.17
9	Gurjo	*Tinospora cordifolia*	67.11	70	18.42	15.66
10	Allo	*Girardinia diversiflora*	268.42	74	116.84	87.63
11	Ban Tarul	*Dioscorea hamiltonii*	67.11	1950	40.84	36.76
12	Guyeli	*Elaeagnus umbellate*	67.11	230	4.82	4.34
13	Indreni	*Trichosanthes tricuspidata*	134.21	100	4.19	3.77
14	Majitho	*Rubia manjith*	201.32	42	33.16	28.19
15	Titepati	*Artemisia indica*	335.53	67	88.16	74.94

SN	Local name	Scientific name	Potential habitat area (ha)	Wt/Plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
16	Kurilo	*Asparagus racemosus*	268.42	15	15.79	11.84
17	Sisnu	*Urtica dioica*	268.42	35	36.84	27.63
18	Sunpati	*Rhododendron anthopogon*	67.11	58.5	1.23	1.1
19	Chiraito	*Swertia chirayita*	134.21	8	4.21	3.58
20	Paakhanbed	*Bergenia ciliata*	134.21	25	13.16	9.21
21	Satuwa	*Paris polyphylla*	134.21	10	5.26	3.68
22	Kakoli (Ban Lasun)	*Fritillaria cirrhosa*	67.11	25.8	6.79	4.75
23	Bikh	*Aconitum spicatum*	67.11	10	2.63	1.84
24	Rato Chyaau	*Laetiporus sulphureus*	67.11	8	2.11	1.79
25	Jatamansi	*Nardostachys jatamansi*	67.11	13.5	3.55	2.49
26	Khiraunla	*Polygonatum cirrhifolium*	67.11	35	9.21	6.45
27	Kutki	*Neopicrorhiza scrophulariiflora*	67.11	14.4	3.79	2.65
28	Naagbeli	*Lycopodium clavatum*	67.11	40	10.53	8.95
29	Nirmasi	*Delphinium denudatum*	67.11	15.3	4.03	2.82
30	Padamchaal	*Rheum austral*	67.11	67.2	17.68	12.38
31	Panchaule	*Dactylorhiza hatagirea*	67.11	4.3	1.13	0.79
32	Sugandhawaal	*Valeriana jatamansi*	67.11	20	5.26	3.68
33	Yarshagumba	*Ophiocordyceps sinensis*	67.11	5.5	0.24	0.22
34	Lauth salla	*Taxus wallichiana*	335.52	8400	35.18	11.61
35	Kaaulo	*Machillus odoratissima*	201.31	5000	12.56	4.14
36	Tejpat leaves	*Cinnamomum tamala*	201.31	9500	23.87	19.09
37	Tejpat Bark	*Cinnamomum tamala*	201.31	1500	3.77	1.24
38	Kafal	*Myrica esculenta*	67.1	5000	4.6	4.14
39	Amala	*Phyllanthus emblica*	67.1	6500	5.4	4.86

3.9.1.6 Taghring CAMC (Bhujung UCO)

Area: 8240 ha (22.8% of UCO, 1.1 % of ACA)

Potential NTFPs: Pipla, Tusa, Nigalo, Lokta, Siltimur, Kaaulo, Kafal, Tejpat, Timur, Titepati, Chutro, Niguro, Gurjo, Indreni, Allo, Amriso, Majitho, Sisnu, Kurilo, Chiraito, Chyau, Naagbeli, Pakhanbed, Satuwa, Amala, Yarshagumba, Bikh, Kutki, Sugandhawal, Thulo okhati, Guyeli, Sunpati, Panchaule, Dhakayo, Ban lasun, Khiraula, Jhyau, Nirmasi, Bhutkesh, Padamchal, Lauth salla, Dhupi, Dhatelo, Indreni, Jatamansi, Talis patra

a) Ecological assessment

In the forest area of Bhujung CAMC, locally preferred NTFPs Lauth Salla (IVI=124.67), Kafal (IVI= 56.4) and Amala (IVI=26.05) are found in the canopy layer. Ecological dominance of major NTFPs is available in the understory and ground vegetation of this CAMC. Locally preferred NTFPs such as Tusa (PV=11.21), Lokta (PV= 11.11) and Chutro (PV=10.26) are more prominent in the understory layer followed by Timur (PV=5.38). In the ground vegetation, higher prominence of Titepati (PV=2.56), Niguro (PV=1.83), Majitho (PV=1.72), Allo (PV=1.72) and Kurilo (PV=1.61), are recorded.

Table 16: Dominance and prominence of potential NTFPs in Taghring CAMC

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Lauth Salla	*Taxus wallichiana*	41.18	40	43.49	124.67
Kafal	*Myrica esculenta*	17.65	20	18.75	56.4
Amala	*Phyllanthus emblica*	8.82	8.57	8.66	26.05
Tejpat	*Cinnamomum tamala*	8.82	8.57	8.66	26.05
Talis Patra	*Abies spectabilis*	5.88	5.71	8.11	19.7
Shrub					
Species	***Scientific Name***	**Frequency**			***PV***
Tusa	*Drepanostachyum falcatum*	0.28			11.21
Lokta	*Daphne bholua*	0.37			11.11
Chutro	*Berberis aristata*	0.37			10.26
Timur	*Zanthoxylum armatum*	0.09			5.38
Herb					
Species	***Scientific Name***	**Frequency**			***PV***
Titepati	*Artemisia indica*	0.13			2.56
Niguro	*Diplazium maximum*	0.05			1.83
Majitho	*Tinospora cordifolia*	0.11			1.72
Allo	*Girardinia diversifolia*	0.03			1.72
Kurilo	*Asparagus racemosus*	0.04			1.61

b) Prioritized species and productivity

Pipla, Tusa, Nigalo, Lokta, Siltimur, Kaaulo, Kafal, Tejpat, Timur, Titepati, Chutro, Niguro, Gurjo, Indreni, Allo, Amriso, Majitho, Sisnu, Kurilo, Chiraito, Chyau, Naagbeli, Pakhanbed, Satuwa, Amala, Yarshagumba, Bikh, Kutki, Sugandhawal, Thulo okhati, Guyeli, Sunpati, Panchaule, Dhakayo, Ban lasun, Khiraula, Jhayu, Nirmasi, Bhutkesh, Padamchal, Lauth salla, Dhupi, Dhatelo, Indreni, Jatamansi, jhyau, Talis patra are most prioritized plant based NTFPs by the local community of Taghring CAMC.

Table 17: Prioritized NTFPs with their habitat and production potential in Taghring CAMC

SN	Local name	Scientific name	Potential habitat area (ha)	Wt/Plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
1	Tusa	*Drepanostachyum falcatum*	2336.72	120	42.76	32.07
2	Lokta	*Daphne bholua*	3074.63	58	20.67	15.5
3	Chutro	*Berberis aristata*	3074.63	120	39.91	13.17
4	Nigalo	*Thamnocalamus spathiflorus*	2336.72	80	28.51	21.38
5	Timur	*Zanthoxylum armatum*	737.91	800	57.01	51.31
6	Dhatelo	*Prinsepia utilis*	737.91	110	7.84	7.06
7	Sunpati	*Rhododendron anthopogon*	245.97	58.5	1.39	1.25
8	Siltimur	*Lindera neesiana*	368.96	900	32.07	28.86
9	Ban Tarul	*Dioscorea hamiltonii*	245.97	1950	46.32	41.69
10	Guyeli	*Girardinia diversiflora*	122.99	260	6.18	5.56
11	Pipla	*Piper mullesua*	122.99	140	6.65	5.99
12	Titepati	*Artemisia indica*	1106.87	35	73.13	62.16
13	Niguro	*Diplazium maximum*	491.94	15	13.43	10.07
14	Nagbeli	*Lycopodium clavatum*	983.88	25	29.85	25.37
15	Majitho	*Rubia manjith*	983.88	54	64.48	54.81
16	Allo	*Girardinia diversifolia*	245.97	64	28.66	21.5
17	Khiraula	*Polygonatum cirrhifolium*	860.9	15	15.67	10.97
18	Sissno	*Urtica dioica*	860.9	70	114.93	86.2
19	Kurilo	*Asparagus racemosus*	368.96	40	17.91	13.43
20	Chiraito	*Swertia chirayita*	614.93	8	5.97	5.07
21	Satuwa	*Paris polyphylla*	614.93	11.5	10.3	7.21

SN	Local name	Scientific name	Potential habitat area (ha)	Wt/Plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
22	Amriso	*Thysanolaena maxima*	491.94	55	41.04	36.94
23	Dhakayo	*Arisaema griffithii*	491.94	30	22.39	16.79
24	Indreni	*Trichosanthes tricuspidate*	122.99	100	3.56	3.2
25	Gurjo	*Tinospora cordifolia*	245.97	70	20.9	17.77
26	Rato Chyaau	*Laetiporus sulphureus*	245.97	18	5.37	4.56
27	Pakhanved	*Bergenia ciliata*	245.97	25	11.19	7.83
28	Panchaule	*Dactylorhiza hatagirea*	245.97	4.3	1.28	0.9
29	Kakoli (Ban Lasun)	*Fritillaria cirrhosa*	122.99	10.5	1.57	1.1
30	Bikh	*Aconitum spicatum*	122.99	15	2.24	1.57
31	Jatamnsi	*Nardostachys jatamansi*	122.99	15.5	2.31	1.62
32	Jhyau	*Lichen sp*	122.99	9	1.34	1.13
33	Kutki	*Neopicrorhiza scrophulariifolia*	122.99	14.4	2.15	1.51
34	Nirmasi	*Delphinium denudatum*	122.99	13.5	2.01	1.41
35	Padamchal	*Rheum austral*	122.99	67.2	10.03	7.02
36	Sugandhawaal	*Valeriana wallichii*	122.99	20	2.99	2.09
37	Thulo Okhati	*Astilbe rivularis*	122.99	18	2.69	1.88
38	Tin Patae Satuwa	*Trillium govanianum*	122.99	5	0.75	0.53
39	Yarshagumba	*Ophiocordyceps sinensis*	122.99	5.5	0.04	0.04
40	Lauth Salla	*Taxus wallichiana*	1721.79	9000	59.86	19.75
41	Kafal	*Myrica esculenta*	737.91	6500	21.62	19.46
42	Amala	*Phyllanthus emblica*	368.96	5000	7.13	6.42
43	Tejpat leaves	*Cinnamomum tamala*	368.96	9000	12.82	10.25
44	Tejpat Bark	*Cinnamomum tamala*	368.96	1500	2.14	0.71
45	Talis Patra	*Abies spectabilis*	245.97	8500	8.08	6.46
46	Kaulo	*Machilus odoratissima*	245.97	9500	9.03	2.98

3.9.1.7 Simpani CAMC (Bhujung UCO)

Area: 620 ha (1.7% of UCO, 0.1 % of ACA)
Potential NTFPs: Pipla, Tusa, Nigalo, Lokta, Siltimur, Kaaulo, Kafal, Tejpat, Timur, Titepati, Chutro, Niguro, Gurjo, Indreni, Allo, Amriso, Majitho, Sisnu, Kurilo, Chiraito, Chyau, Naagbeli, Pakhanbed, Satuwa, Amala

a) Ecological assessment

In the forest area of Bhujung CAMC, locally preferred NTFPs Amala (IVI=89), Kafal (IVI= 49.96) and Lapsi (IVI=32.12) are found in the canopy layer. Ecological dominance of major NTFPs is available in the understory and ground vegetation of this CAMC. Locally preferred NTFPs such as Siltimur (PV=6.7), and Timur (PV=6.3) are more prominent in the understory layer followed by Ban tarul (PV=5.9). In the ground vegetation, higher prominence of Kurilo (PV=2.74), Titepati (PV=2.74), Gurjo (PV=2.37), are recorded.

Table 18: Dominance and prominence of potential plant based NTFPs in Simpani CAMC

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Amala	*Phyllanthus emblica*	42.86	20	26.14	89
Kafal	*Myrica esculenta*	14.29	20	15.67	49.96
Lapsi	*Choerospondias axillaris*	14.29	10	7.83	32.12
Kaulo	*Machilus duthiei*	14.29	10	9.19	33.48
Tejpat	*Cinnamomum tamala*	14.29	10	7.19	31.48
Shrub					
Species	**Scientific Name**	**Frequency**			**PV**
Siltimur	*Lindera neesiana*	0.2			6.7
Timur	*Zanthoxylum armatum*	0.1			6.3
Ban tarul	*Discorea hamiltonii*	0.4			5.9
Chutro	*Berberis aristata*	0.2			5.6
Herb					
Species	**Scientific Name**	**Frequency**			**PV**
Kurilo	*Asparagus racemosus*	0.3			2.74
Titepati	*Artemisia indica*	0.3			2.74
Gurjo	*Tinospora cordifolia*	0.1			2.37
Sisnu	*Urtica dioica*	0.2			2.23
Allo	*Girardinia diversifolia*	0.1			2.1
Niguro	*Diplazium maximum*	0.1			1.58

b) Prioritized species and productivity

Pipla, Tusa, Nigalo, Lokta, Siltimur, Kaaulo, Kafal, Tejpat, Timur, Titepati, Chutro, Niguro, Gurjo, Indreni, Allo, Amriso, Majitho, Sisnu, Kurilo, Chiraito, Chyau, Naagbeli, Pakhanbed, Satuwa, Amala are most Prioritized plant based NTFPs by the local community of Simpani CAMC.

Table 19: Prioritized NTFPs with their habitat and production potential in Simpani CAMC

S.N.	Local name	Scientific name	Potential habitat area (ha)	Wt/Plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
1	Siltimur	*Lindera neesiana*	124	70	11.14	10.03
2	Timur	*Zanthoxylum armatum*	62	135	10.74	9.67
3	Ban Tarul	*Dioscorea hamiltonii*	248	220	70.03	63.03
4	Chutro	*Berberis aristata*	124	120	19.1	6.3
5	Guyeli	*Elaeagnus umbellate*	124	240	38.2	34.38
6	Ainselu	*Rubus ellipticus*	62	165	26.26	23.63
7	Dhatelo	*Prinsepia utilis*	124	110	17.51	15.76
8	Indreni	*Trichosanthes tricuspidate*	62	100	7.96	7.16
9	Pipla	*Piper mullesua*	62	40	6.37	5.73
10	Kurilo	*Asparagus racemosus*	186	38	38	28.5
11	Titepati	*Artemisia indica*	186	35	35	29.75
12	Gurjo	*Tinospora cordifolia*	62	35	35	29.75
13	Sisno	*Urtica dioica*	124	42	42	31.5
14	Allo	*Girardinia diversiflora*	62	55	55	41.25
15	Niguro	*Diplazium maximum*	62	15	30	22.5
16	Amriso	*Thysanolaena maxima*	62	35	35	31.5
17	Rato Chyaau	*Laetiporus sulphureus*	62	9	9	7.65
18	Majitho	*Rubia manjith*	62	48	48	40.8
19	Pakhanved	*Bergenia ciliata*	62	14	14	9.8
20	Amala	*Phylanthus emblica*	186	3500	22.28	20.05
21	Kafal	*Myrica esculenta*	62	3000	19.09	17.18
22	Kaulo	*Machilus odoratissima*	62	9500	30.29	9.98
23	Tejpat Leaves	*Cinnamomum tamala*	62	10000	31.83	25.46
24	Tejpat Bark	*Cinnamomum tamala*	62	1500	4.77	1.58

3.9.1.8 Uttarkanya CAMC

Area: 620 ha (1.7% of UCO, 0.1 % of ACA)
Potential NTFPs: Pipla, Tusa, Nigalo, Lokta, Siltimur, Kaaulo, Kafal, Tejpat, Timur, Titepati, Chutro, Niguro, Gurjo, Indreni, Allo, Amriso, Majitho, Sisnu, Kurilo, Chiraito, Chyau, Naagbeli, Pakhanbed, Satuwa, Amala

a) Ecological assessment

In the forest area of Bhujung CAMC, locally preferred NTFPs Kafal (IVI= 84.7) and Tejpat (IVI=76.8) are found in the canopy layer. Ecological dominance of major NTFPs is available in the understory

and ground vegetation of this CAMC. Locally preferred NTFPs such as Ban tarul (PV=8.39), and Tusa (PV=8.16), are more prominent in the understory layer followed by Timur (PV=5.77). In the ground vegetation, higher prominence of Titepati (PV=7.63), Amriso (PV=4.33), Sisnu (PV=4.08), Kurilo (PV=2.5), and Niguro (PV=2.5) are recorded.

Table 20: Dominance and prominence of potential plant based NTFPs in Uttarkanya CAMC

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Kafal	*Myrica esculenta*	25	25	34.7	84.7
Tejpat	*Cinnamomum tamala*	25	25	26.8	76.8
Chiple Kaulo	*Machilus duthiei*	25	25	21.5	71.5
Amala	*Phyllanthus emblica*	25	25	16.8	66.8
Shrub					
Species	**Scientific Name**	**Frequency**			**PV**
Ban tarul	*Dioscorea hamiltonii*	0.41			8.39
Tusa	*Drepanostachyum falcatum*	0.16			8.16
Timur	*Zanthoxylum armatum*	0.08			5.77
Herb					
Species	**Scientific Name**	**Frequency**			**PV**
Titepati	*Artemisia indica*	0.58			**7.63**
Amriso	*Thysanolaena maxima*	0.33			4.33
Sisnu	*Urtica dioica*	0.16			4.08
Kurilo	*Asparagus racemosus*	0.25			2.5
Niguro	*Diplazium maximum*	0.25			2.5

b) Prioritized species and productivity

Pipla, Tusa, Nigalo, Lokta, Siltimur, Kaaulo, Kafal, Tejpat, Timur, Titepati, Chutro, Niguro, Gurjo, Indreni, Allo, Amriso, Majitho, Sisnu, Kurilo, Chiraito, Chyau, Naagbeli, Pakhanbed, Satuwa, Amala are most Prioritized plant based NTFPs by the local community of Uttarkanya CAMC.

Table 21: Prioritized NTFPs with their habitat and production potential in Uttarkanya CAMC

SN	**Local name**	**Scientific name**	**Potential habitat area (ha)**	**Wt/Plant (gm)**	**Wt/ha (kg)**	**Sustainable amount to harvest (kg/ha)**
1	Ban Tarul	*Dioscorea hamiltonii*	258.33	220	72.95	51.06
2	Nigalo	*Thamnocalamus spathiflorus*	103.33	80	10.61	7.96

SN	Local name	Scientific name	Potential habitat area (ha)	Wt/Plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
3	Tusa	*Drepanostachyum falcatum*	103.33	120	15.92	11.94
4	Titepati	*Artemisia indica*	361.67	35	204.17	173.54
5	Gurjo	*Tinospora cordifolia*	155	35	175	148.75
6	Timur	*Zanthoxylum armatum*	51.67	135	8.95	8.06
7	Amriso	*Thysanolaena maxima*	206.67	35	116.67	105
8	Ainselu	*Rubus ellipticus*	51.67	165	10.94	9.85
9	Lokta	*Daphne bholua*	51.67	57	3.78	2.83
10	Siltimur	*Lindera neesiana*	51.67	70	4.64	4.18
11	Sisnu	*Urtica dioica*	103.33	42	70	52.5
12	Indreni	*Trichosanthes tricuspidata*	51.67	100	6.63	5.97
13	Kurilo	*Asparagus racemosus*	155	40	100	75
14	Niguro	*Diplazium maximum*	155	15	37.5	28.13
15	Majitho	*Rubia manjith*	103.33	45	75	63.75
16	Gujargano	*Cissaempelos pareira*	51.67	40	33.33	28.33
17	Allo	*Girardinia diversifolia*	51.67	55	45.83	34.38
18	Chiraito	*Swertia chirayita*	51.67	8	6.67	5
20	Rato Chyaau	*Laetiporus sulphureus*	51.67	9	7.5	6.38
21	Guyeli	*Elaeagnus umbellata*	51.67	240	15.92	14.32
22	Pakhanbed	*Bergenia ciliata*	51.67	14	11.67	8.17
23	Pipla	*Piper mullesua*	51.67	40	2.65	2.39
24	Kafal	*Myrica esculenta*	51.67	6500	17.24	15.52
25	Tejpat leaves	*Cinnamomum tamala*	51.67	10000	26.53	21.2
26	Tejpat Bark	*Cinnamomum tamala*	51.67	1500	3.97	1.31
27	Chiple Kaulo	*Machilus duthiei*	51.67	9500	25.2	8.32
28	Amala	*Phyllanthus emblica*	51.67	4500	11.94	10.74

3.9.2 Ghandruk UCO

In 1990, the pioneering project for establishing conservation areas in Nepal began in Ghandruk UCO. One of three UCOs representing Kaski district, Ghandruk covers 10.2% (77,817 hectares) of the ACA. It is also the sole UCO representing Myagdi district. The Ghandruk UCO includes six CAMCs: three from Kaski district (Ghandruk, Dangsing, and Lumle) and three from Myagdi district (Shikha, Ghara, and Narchyang). This UCO spans various climatic zones in Nepal, from tropical to nival. There are 20 NTFPs found to be prioritized by the local people within which Bish jharne (*Arisaema speciosum*), Satuwa (*Paris polyphylla*) and Tusa (*Drepanostachyum falcatum*) are preferred in all CAMCs of Ghandruk UCO.

Table 22: Prioritized NTFPs of Ghandruk UCO with harvesting protocols

SN	Local name	Scientific name	CAMCs	Frequency	Harvesting protocols
1	Bish jharne	*Arisaema speciosum*	6	100	Harvest with small twigs using sharp sickles, care mother plant to survive. Collect optimum 75% of the population.
2	Satuwa	*Paris polyphylla*	6	100	Harvest leaves with small twigs using sharp sickle care mother plant to survive. Collect optimum 75% of the population.
3	Tusa	*Drepanostachyum falcatum*	6	100	Rational harvesting maintaining at least 5 plots. Reserve about 25% of harvesting area and production for sustainable regeneration. Harvest shoots using sharp sickle care mother plant to survive. Harvest only matured and outer shoots of culm.

SN	Local name	Scientific name	CAMCs	Frequency	Harvesting protocols
4	Lokta	*Daphne bholua*	5	83.33	Collect plant bark from the end of September or mid-October continuing into late Spring to mid-May (Kartik to Jestha) with two months break in the coldest months of mid-December to mid-February (Poush to Magh). Select only the plants of 10 cm or more circumference girth and 8-10 years or more aged stems for bark collection. Cut the matured stems at 15/30 cm above the ground for letting better coppicing and root system safe. Collect optimum 75% of the population.
5	Nirmasi	*Delphinium denudatum*	5	83.33	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
6	Niguro	*Dryopteris cochleate*	5	83.33	Harvest leaves with small twigs using sharp sickle care mother plant to survive. Collect optimum 75% of the population.
7	Allo	*Girardinia diversifolia*	5	83.33	Collect bark from 2 years or more matured plants after releasing seeds in October-November. Three years rotation and reserve at least 25% production and area for regeneration are recommended.
8	Chiraito	*Swertia chirayita*	5	83.33	Collect mature plant materials (seeds are fully formed, matured, dried and disseminated). Collect optimum 85% of the population. Rational harvesting ensuring sustainable production.

SN	Local name	Scientific name	CAMCs	Frequency	Harvesting protocols
9	Kakoli (Ban lasun)	*Fritillaria cirrhosa*	4	66.67	Harvest leaves using sharp sickle, care mother plant to survive. Collect optimum 75% of the population.
10	Sisnu	*Urtica dioica*	4	66.67	Collect bark from 2 years or more matured plants after releasing seeds in October-November. Three years rotation and reserve at least 25% production and area for regeneration are recommended.
11	Kurilo	*Asparagus racemosus*	3	50	Harvest leaves with small twigs using sharp sickle care mother plant to survive. Collect optimum 75% of the population.
12	Halhale	*Rumex nepalensis*	2	33.33	Harvest leaves with small twigs using sharp sickle care mother plant to survive. Collect optimum 75% of the population.
13	Rato Chyaau	*Laetiporus sulphureus*	2	33.33	Collect matured plant only. Collect optimum 85% of the plant population.
14	Bikh	*Aconitum spicatum*	2	33.33	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration.
15	Timur	*Zanthoxylum armatum*	1	16.67	Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
16	Padamchal	*Rheum austral*	1	16.67	Harvest leaves with petiole (Chulthi) using sharp sickle, care mother plant to survive. Leaves: Collect optimum 75% of the population. Collect optimum 70% of the population (Tuber).
17	Siltimur	*Litsea cubeba*	1	16.67	Avoid Mechanical Harvesting; picked the fruits using hand or thrashed with a stick without damaging the branches. Avoid lopping/cutting of fruit

SN	Local name	Scientific name	CAMCs	Frequency	Harvesting protocols
					branching during fruit collection. Maximum allowable harvest quantity 90% of fruits.
18	Pakhanbed	*Bergenia ciliata*	1	16.67	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
19	Bojho	*Acorus calamus*	1	16.67	Harvest only the desired portion of the plant.Dug out tubers of matured and older plants only. Replent/left the apical portion of tubers. Immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance population
20	Nigalo	*Thamnocalamus spathiflorus*	1	16.67	Rational harvesting maintaining at least 5 plots. Reserve about 25% of harvesting area and production for sustainable regeneration. Harvest leaves with small twigs using sharp sickle care mother plant to survive. Harvest only matured and outer shoots of culm.

3.9.2.1 Ghandruk CAMC (Ghandruk UCO)

Area: 28110ha (36.1% of UCO, 3.7% of ACA)

Potential NTFPS: Lokta, Dhakayo, Satuwa, Tusa, Niguro, Allo, Chirato, Ban Lasun and Kurilo

a) Ecological assessment

In the forest area of Ghandruk CAMC, locally preferred NTFPs are shrubs and herbs. Canopy layer is dominated by Rhododendron and Uttis forest. Sisnu, Allo, Niguro are found in the ground vegetation layer. Understorey and ground floor of forest is mostly habituated by these preferred species. Locally preferred NTFPS like Kurilo (PV = 3.99), Satuwa (PV = 12.91), Tusa (PV = 3.19), Chiraito (PV = 1.96) are prominent in understorey layer.

Table 23: Dominance and prominence value of potential plant based NTFPs in Ghandruk CAMC

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Uttis	***Alnus nepalensis***	**40.89**	**27.89**	**36.45**	**117.32**
Laliguras	***Rhododendron arboreum***	**18.18**	**51.72**	**58.24**	**111.51**
Lokta	***Daphne bholua***	**40.89**	**20.69**	**5.35**	**71.14**
Shrub					
Species	**Scientific Name**	**Frequency**			**PV**
Ainselu	***Rubus ellipticus***	**0.07**			**0.92**
Kurilo	***Asparagus recemosus***	**0.20**			**3.99**
Nigalo	***Thamnocalamus spathiflorus***	**0.27**			**3.69**
Tusa	***Drepanostachyum falcatum***	**0.20**			**3.19**
Herb					
Species	**Scientific Name**	**Frequency**			**PV**
Sisnu	***Urtica dioica***	**0.13**			**1.30**
Allo	***Girardinia diversifolia***	**0.13**			**1.96**
Niguro	***Dryopteris cochleata***	**0.20**			**3.99**
Satuwa	***Paris polyphylla***	**0.27**			**12.91**
Dhakayo	***Arisaema speciosum***	**0.27**			**9.22**
Chiraito	***Swertia chirayita***	**0.13**			**1.96**

Bikh	***Aconitum spicatum***	**0.13**	**2.61**

b) Prioritized species and productivity

Most prioritized plant based NTFPs by the local community of Ghandruk CAMC are Dhakayo, Lokta, Tusa, Allo, Chiraito, Halhale, Ban Lasun, Bikh, Sisno and Niguro. In this CAMC potential habitats of Dhakayo, Tusa, Allo, Chiraito and Lokta are higher than other species. In terms of production most of the prioritized species except Bikh have harvestable quantity in this CAMC.

Table 24: Prioritized NTFPs with their habitat and production potential in Ghandruk CAMC

S. N	Local name	Scientific name	Potential habitat area (ha)	Wt/Plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
1	Dhakayo	*Arisaema speciosum*	7496	36	120	36
2	Lokta	*Daphne bholua*	7496	62	19.75	12.83
3	Tusa	*Drepanostachyum falcatum*	5622	50	10.62	6.38
4	Chiraito	*Swertia chirayita*	3748	20	40	8
5	Allo	*Giardinia diversifolia*	3748	35	70	45.5
6	Ban Lasun	*Fritillaria cirrhosa*	3748	24	64	19.2
7	Halhale	*Rumex Nepalensis*	5622	19	50.67	15.20
8	Satuwa	*Paris polyphylla*	7496	10	26.67	8.01
9	Bikha	*Aconitum spicatum*	3748	25	2.39	0.71
10	Sisnu	*Urtica dioica*	3748	20	26.67	8.01
11	Nirmasi	*Delphinium denudatum*	1874	10	13.33	3.9
12	Niguro	*Dryopteris cochleata*	5622	20	66.67	13.4

3.9.2.2 Dangsing CAMC

Area: 4250 ha (5.5% of UCO, 0.6% of ACA)

Potential NTFPs: Ban Lasun, Dhakayo, Kurilo, Tusa, Satuwa, and Chiraito.

a) Ecological assessment

In the forest area of Dangsing CAMC, locally preferred NTFPs are unavailable at canopy layer. Ecological dominancy of NTFPs is available in the understorey and ground vegetation layer. Locally preferred NTFPS Chutro (PV = 12.33) and Tusa (PV = 1.69) are more prominent in the understorey layer. In the ground vegetation layer there is higher prominence of Dhakayo (PV = 4.40), Kurilo (PV = 2.48), Chiraito (PV = 2.94) and Satuwa (PV = 2.12).

Table 25: Dominance and prominence value of potential plant based NTFPs in Dangsing CAMC

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Uttis	***Alnus nepalensis***	**14.4**	**14.86**	**17.13**	**46.40**
Laliguras	***Rhododendron arboretum***	**6.40**	**29.73**	**29.20**	**65.33**
Chilaune	***Schima wallichii***	**28.80**	**6.76**	**7.20**	**42.76**
Mauwa	***Engelhardia spicata***	**7.20**	**21.62**	**34.29**	**63.12**
Rakchan	***Daphniphyllum himalense***	**14.40**	**10.81**	**8.52**	**33.85**
Lokta	***Daphne bholua***	**28.80**	**16.22**	**3.66**	**48.67**
Shrub					
Species	**Scientific Name**	**Frequency**			**PV**
Chutro	***Berberis asiatica***	**0.27**			**12.33**
Bhuletro	***Butea minor***	**0.20**			**5.96**
Tusa	***Drepanostachyum falcatum***	**0.20**			**1.69**
Ainselu	***Rubus ellipticus***	**0.07**			**1.53**
Sisnu	***Urtica dioica***	**0.13**			**0.54**
Herb					
Species	**Scientific Name**	**Frequency**			**PV**
Halhale	***Urtica dioica***	**0.13**			**4.86**
Dhakayo	***Arisaema speciosum***	**0.27**			**4.40**
Allo	***Giardinia diversifolia***	**0.13**			**0.78**
Kurilo	***Asparagus racemosus***	**0.27**			**2.48**
Satuwa	***Paris polyphylla***	**0.53**			**2.12**

Chiraito	***Swertia chirayita***	**0.60**	**2.94**
Lunde	***Amaranthus spinosus***	**0.13**	**1.38**
Kakoli (Ban Lasun)	***Fritillaria cirrhosa***	**0.13**	**0.35**

b) Prioritized species and productivity

Dhakayo, Ban Lasun, Tusa, Kurilo, Satuwa, Chiraito and Nigalo are the most prioritized plant based NTFPs by the local communities of Dangsing CAMC. Potential habitats of commercial NTFPs like Dhakayo, Tusa, Satuwa, Chiraito and Kurilo are higher than the other species. In terms of production all the species have harvestable quantity in this CAMC.

Table 26: Prioritized NTFPs with their habitat and production potential in Dangsing CAMC

S. N	Local name	Scientific name	Potential habitat area (ha)	Wt/Plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
1	Dhakayo	*Arisaema speciosum*	1133.33	45.2	60.27	18.08
2	Tusa	*Drepanostachyum falcatum*	850	103.2	43.2	12.96
3	Chiraito	*Swertia chirayita*	2550	17.2	45.87	9.17
4	Allo	*Girardinia diversifolia*	566.7	24.8	49.60	32.24
5	Ban Lasun	*Fritillaria cirrhosa*	566.7	23.8	47.06	14.11
6	Halhale	*Rumex nepalensis*	566.7	15.5	20.67	6.20
7	Satuwa	*Paris polyphylla*	2266	14.3	7.33	5.5
8	Nirmasi	*Delphinium denudatum*	566.7	13.2	17.60	5.28
9	Niguro	*Dryopteris cochleata*	1133.4	23.5	62.67	18.80

3.9.2.3 Lumle CAMC (Ghandruk UCO)

Area: 4870 ha (6.3% of UCO,0.6% of ACA)

Potential NTFPs: Dhakayo, Satuwa, Chirato, Kurilo, Allo, Lokta, Niguro, Chutro and Sisnu.

a) Ecological assessment

In the forest area of Lumle CAMC, locally preferred NTFPs are unavailable at the canopy layer. Ecologically understorey and ground vegetation layer is habituated by of most the NTFPS found in this CAMC. Locally preferred NTFPs like Tusa (PV = 7.39), Satuwa (PV = 5.84) Allo (PV = 3.59), Kurilo (PV = 2.72) and Chiraito (PV = 3.73) are prominent in the ground vegetation and understorey layer.

Table 27: Dominance and prominence value of potential plant based NTFPs in Lumle CAMC

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Laliguras	***Rhododendron arboretum***	**7.19**	**21.69**	**27.49**	**56.36**
Rakchan	***Daphniphyllum himalense***	**5.99**	**20.48**	**22.12**	**48.54**
Lokta	***Daphne bholua***	**8.98**	**14.46**	**3.59**	**27.03**
Malato	***Macaranga denticulata***	**8.98**	**9.64**	**9.15**	**27.77**
Kafal	***Myrica esculanta***	**8.98**	**9.64**	**8.35**	**26.98**
Chilaune	***Schima wallichii***	**11.98**	**8.43**	**8.37**	**28.78**
Uttis	***Alnus nepalensis***	**11.98**	**6.02**	**5.72**	**23.72**
Mauwa	***Engelhardia spicata***	**17.96**	**6.02**	**11.93**	**35.92**
Katus	***Castonopsis indica***	**17.96**	**3.61**	**3.28**	**24.86**
Shrub					
Species	**Scientific Name**	**Frequency**			**PV**
Angeri	***Lyonia ovalifolia***	**0.13**			**4.13**
Ainselu	***Rubus ellipticus***	**0.07**			**1.30**
Tusa	***Drepanostachyum falcatum***	**0.13**			**7.39**
Nigalo	***Thamnocalamus spathiflorus***	**0.20**			**1.44**
Herb					
Species	**Scientific Name**	**Frequency**			**PV**
Banmara	***Eupatorium sp***	**0.20**			**0.56**
Dhakayo	***Arisaema speciosum***	**0.20**			**1.10**
Allo	***Giardinia diversifolia***	**0.13**			**3.59**

Kurilo	***Asparagus racemosus***	**0.20**	**2.72**
Satuwa	***Paris polyphylla***	**0.27**	**5.84**
Chiraito	***Swertia chirayita***	**0.27**	**3.73**
Pakhenbed	***Bergenia ciliata***	**0.13**	**1.83**
Nagbeli	***Lycopodium clavatum***	**0.13**	**0.66**
Banko	***Arisaema tortuosum***	**0.07**	**1.05**

b) Prioritized species and productivity

Most prioritized plant based NTFPs by the local communities of Lumle CAMC are Satuwa, Tusa, Chiraito, Kurilo, and Dhakayo. Other NTFPs like Allo, Ban Lasun, Lokta, Nirmasi and Pakhenbed are also preferred by the locals. Potential habitats of commercial NTFPs like Dhakayo, Tusa, Satuwa, Chiraito and Kurilo are higher than the other species. Commercial NTFPs are mostly found in the understorey. In terms of production most of the species have harvestable amount in this CAMC.

Table 28: Prioritized NTFPs with their habitat and production potential in Lumle CAMC

S. N.	Local name	Scientific name	Potential habitat area (ha)	Wt/Plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
1	Tusa	*Drepanostachyum falcatum*	974	92.2	24.7	7.41
2	Satuwa	*Paris polyphylla*	1298.7	7.2	19.20	5.76
3	Kurilo	*Asparagus racemosus*	974	15.5	41.30	12.39
4	Pakhenbed	*Bergenia ciliata*	649.4	15.3	30.60	9.18
5	Dhakayo	*Arisaema speciosum*	974	14.3	47.67	14.30
6	Chiraito	*Swertia chirayita*	198.7	13.2	44	8.8
7	Allo	*Girardinia diversifolia*	649.4	23.8	3.79	2.46
8	Ban Lasun	*Fritillaria cirrhosa*	649.4	9.5	12.67	3.80
9	Lokta	*Daphne bholua*	650	45.5	121.33	78.86
10	Niguro	*Dryopteris cochleata*	650	23.8	47.6	14.28
11	Nirmasi	*Delphinium denudatum*	324.7	17.2	22.93	6.87

3.9.2.4 Ghara CAMC

Area: 4000 ha (5.1% of UCO, 0.5% of ACA)

Potential NTFPS: Timur, Siltimur, Tusa, Satuwa, Niguro, Ainselu and Dhokayo

a) Ecological assessment

Within the forest area of Ghara CAMC, locally preferred NTFPs are shrubs and herbs. Canopy layer is dominated by Rhododendron and Uttis forest. Sisnu, Allo, Niguro are found in the ground vegetation layer. Understorey and ground floor of forest is mostly habituated by these preferred species. Locally preferred NTFPS like Kurilo (PV = 0.99), Satuwa (PV = 4.97), Tusa (PV = 3.98), Niguro (PV = 3.98) are prominent in understorey layer.

Table 29: Dominance and prominence value of potential plant based NTFPs in Ghara CAMC

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Uttis	***Alnus nepalensis***	**7.94**	**32.72**	**13.79**	**44.89**
Lauth Salla	***Taxus wallichiana***	**31.78**	**5.34**	**3.45**	**50.33**
Chilaune	***Schima wallichii***	**15.89**	**7.26**	**5.17**	**34.76**
Siltimur	***Litsea cubeba***	**5.30**	**5.09**	**6.90**	**19.39**
Sallo	***Pinus roxburghii***	**3.53**	**9.80**	**8.62**	**23.25**
Painyu	***Prunus cerasoides***	**7.94**	**5.93**	**8.62**	**23.28**
Timur	***Zanthoxylum armatum***	**7.94**	**6.62**	**12.07**	**25.36**
Guyeli	***Elaeagnus infundibularis***	**4.54**	**6.05**	**17.24**	**25.21**
Laligurans	***Rhododendron arboretum***	**4.54**	**18.53**	**17.24**	**32.27**
Lokta	***Daphne bholua***	**10.59**	**2.67**	**6.09**	**21.27**
Shrub					
Species	**Scientific name**	**Frequency**		**PV**	
Ainselu	***Rubus ellipticus***	**0.13**		**1.62**	
Nigalo	***Thamnocalamus spathiflorus***	**0.20**		**2.98**	
Tusa	***Drepanostachyum***	**0.20**		**3.98**	

	falcatum		
Bilaune	***Maesa chisia***	**0.20**	**3.98**
Angeri	***Lyonia ovalifolia***	**0.13**	**0.81**
Chutro	***Berberis asiatica***	**0.20**	**1.99**
Lokta	***Daphne bholua***	**0.07**	**1.15**
Herb			
Species	**Scientific name**	**Frequency**	**PV**
Sisnu	***Urtica dioica***	**0.13**	**2.43**
Allo	***Girardinia diversifolia***	**0.07**	**1.15**
Niguro	***Dryopteris cochleata***	**0.20**	**3.98**
Satuwa	***Paris polyphylla***	**0.20**	**4.97**
Halhale	***Rumex nepalensis***	**0.13**	**1.62**
Titepati	***Artemisia indica***	**0.13**	**2.43**
Kurilo	***Asparagus racemosus***	**0.20**	**0.99**
Guchichyau	***Morchella esculenta***	**0.07**	**1.15**
Arile	***Biancaea decaptela***	**0.07**	**0.57**
Banko	***Arisaema tortuosum***	**0.13**	**2.43**
Bojho	***Acorus calamus***	**0.13**	**0.81**

b) Prioritized Species and Productivity

Most prioritized plant based NTFPs by the local community of Ghara CAMC are Niguro, Timur,Siltimur, Satuwa, Dhakayo, Sisno, Khiraula and Bhojo. In this CAMC potential habitats of Dhakayo, Tusa, Satuwa, Timur and Sisnu are higher than other species. In terms of production, most of the prioritized species have harvestable quantity in this CAMC.

Table 30: Prioritized NTFPs with their habitat and production potential in Ghara CAMC

S. N	Local name	Scientific name	Potential habitat area (ha)	Wt/Plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
1	**Dhakayo**	***Arisaema speciosum***	**155.7**	**30**	**60**	**48**

2	**Lokta**	***Daphne bholua***	**266.6**	**60**	**6.4**	**2.12**
3	**Tusa**	***Drepanostachyum falcatum***	**800**	**55**	**11.8**	**8.26**
4	**Allo**	***Girardiana diversifolia***	**266.6**	**35**	**46.7**	**15.41**
5	**Satuwa**	***Paris polyphylla***	**800**	**14**	**16.4**	**12.3**
6	**Sisnu**	***Urtica dioica***	**533.33**	**30**	**60**	**36**
7	**Niguro**	***Dryopteris cochleate***	**800**	**22**	**58.7**	**48**
8	**Timur**	***Zanthoxylum armatum***	**140.1**	**1250**	**6.6**	**6**
9	**Siltimur**	***Litsea cubeba***	**122.2**	**27.5**	**5**	**4.5**
10	**Bojho**	***Acorus calamus***	**533.3**	**8**	**5.4**	**3.78**

3.9.2.5 Shikha CAMC

Area: 4600 ha (5.9% of UCO, 0.6% of ACA)

Potential NTFPs: Dhakayo, Kurilo, Tusa, Satuwa, Chiraito, Niguro, Rato Chyau and Bojho.

a) Ecological assessment

In the forest area of Shikha CAMC, locally preferred NTFPs are unavailable at canopy layer. Ecological dominancy of NTFPs are available in the understorey and ground vegetation layer. Locally preferred NTFPS Chutro (PV = 3.38) and Tusa (PV = 3.43) are more prominent in the understorey layer. In the ground vegetation layer, there is higher prominence of Niguro (PV = 6.9), Halhale (PV = 6.8), and Satuwa (PV = 5.4).

Table 31: Dominance and prominence value of potential plant based NTFPs in Shikha CAMC

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Uttis	***Alnus nepalensis***	**31.0**	**45.65**	**56.7**	**125.5**
Laliguras	***Rhododendron arboretum***	**27.6**	**36.96**	**39.1**	**106.2**
Lokta	***Daphne bholua***	**41.4**	**17.39**	**4.2**	**68.3**
Sallo	***Pinus roxburghii***	**49.7**	**15.22**	**14.1**	**101.5**
Painyu	***Prunus cerasoides***	**41.4**	**15.22**	**7.2**	**75.1**
Chilaune	***Schima wallichi***	**62.1**	**10.87**	**4.5**	**89.2**
Shrub					

Species	Scientific Name	Frequency	PV
Ainselu	*Rubus ellipticus*	0.27	1.53
Nigalo	*Thamnocalamus spathiflorus*	0.40	4.70
Tusa	*Drepanostachyum falcatum*	0.33	3.43
Bilaune	*Maesa chisia*	0.40	4.07
Angeri	*Lyonia ovalifolia*	0.33	1.72
Chutro	*Berberis asiatica*	0.47	3.38
Lokta	*Daphne bholua*	0.60	4.22
Herb			
Species	**Scientific Name**	**Frequency**	**PV**
Sisnu	*Urtica dioica*	0.47	5.4
Allo	*Girardinia diversifolia*	0.27	1.5
Niguro	*Dryopteris cochleata*	0.67	6.9
Satuwa	*Paris polyphylla*	0.47	5.4
Halhale	*Urtica dioica*	0.47	6.8
Titepati	*Artemisia indica*	0.27	3.1
Kurilo	*Asparagus racemosus*	0.20	0.7
Chyau	*Agaricus sps.*	0.07	0.3
Banko	*Arisaema tortuosum*	0.40	2.8
Bish Jharne	*Arisaema speciosum*	0.53	3.6

b) Prioritized species and productivity

Most prioritized plant based NTFPs by the local community of Shikha CAMC are Satuwa, Tusa, Dhakayo, Rato chyau, Kurilo and Chiraito. In this CAMC the potential habitats of commercial species like Chiraito, Kurilo, Tusa and Rato Chyau are higher than other species.

Table 32: Prioritized NTFPs with their habitat and production potential in Shikha CAMC

S. N.	Local name	Scientific name	Potential habitat area (ha)	Wt/Plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
1	Bish jharne	*Arisaema speciosum*	2453.3	32	213.33	149.3
2	Tusa	*Drepanostachyum falcatum*	1533.3	57	36.31	25.41
3	Chiraito	*Swertia chirayita*	1533.3	25	38.67	32.86
4	Allo	*Girardinia diversifolia*	1226.7	35	140	46.2
5	Rato Chyaau	*Laetiporus sulphurous*	306.7	45	60.00	51
6	Kurilo	*Asparagus racemosus*	920.0	22	44.00	30.8
7	Satuwa	*Paris polyphylla*	2146.7	7	11.46	8.6
8	Nirmasi	*Delphinium denudatum*	613.3	10	13.33	10.64
9	Padamchal	*Rheum australe*	920.0	30	40.00	28
10	Nigalo	*Thamnocalamus spathiflorus*	1840.0	135	107.48	74.9
11	Lokta	*Daphne bholua*	2760.0	62	36.20	11.94
12	Sisnu	*Urtica dioica*	2146.7	32	41.33	32.8
13	Bikh	*Aconitum spicatum*	920.0	8	10	7

3.9.2.6 Narchang CAMC

Area: 31980 ha (41.1% of UCO, 4.2% of ACA)

Potential NTFPs: Dhakayo, Satuwa, Chirato, Kurilo, Ban Lasun, Tusa, Niguro, Chutro and Sisnu.

a) Ecological assessment

In the forest area of Narchang CAMC, locally preferred NTFPs are unavailable at the canopy layer. Ecologically understorey and ground vegetation layer is habituated by of most the NTFPS

found in this CAMC. Locally preferred NTFPs like Nigalo (PV = 6.00), Chutro (PV = 5.69) Kurilo (PV = 4.88) and Chiraito (PV = 1.45) are prominent in the ground vegetation and understorey layer.

Table 33: Dominance and prominence value of potential plant based NTFPs in Narchang CAMC

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Uttis	***Alnus nepalensis***	**14.95**	**14.08**	**20.37**	**47.03**
Laliguras	***Rhododendron arboretum***	**6.65**	**21.13**	**26.04**	**43.11**
Tanki	***Bauhinia purpurea***	**14.95**	**8.45**	**7.97**	**35.14**
Chilaune	***Schima wallichii***	**11.96**	**9.86**	**10.68**	**35.30**
Mauwa	***Engelhardia spicata***	**14.95**	**11.27**	**6.17**	**33.04**
Okhar	***Juglans regia***	**19.94**	**7.04**	**9.42**	**43.62**
Painyu	***Prunus cerasoides***	**9.97**	**11.27**	**10.63**	**32.98**
Mallato	***Macaranga denticulate***	**6.65**	**16.90**	**8.69**	**29.94**
Shrub					
Species	**Scientific Name**	**Frequency**			**PV**
Chutro	***Berberis asiatica***	**0.53**			**5.69**
Ainselu	***Rubus ellipticus***	**0.20**			**1.45**
Tusa	***Drepanostachyum falcatum***	**0.27**			**3.35**
Nigalo	***Thamnocalamus spathiflorus***	**0.33**			**6.00**
Bhimsenpati	***Buddleja asiatica***	**0.20**			**1.45**
Sisnu	***Urtica dioica***	**0.53**			**3.79**
Kurilo	***Asparagus racemosus***	**0.47**			**3.55**
Herb					
Species	**Scientific Name**	**Frequency**			**PV**
Titepati	***Artemisia indica***	**0.47**			**3.99**
Kurilo	***Asparagus racemosus***	**0.47**			**4.88**
Chiraito	***Swertia chirayita***	**0.20**			**1.45**

Siru	***Imperata cylindrica***	**0.60**	**4.02**
Banso	***Digitaria spp.***	**0.27**	**1.68**

b) Prioritized species and productivity

Ban Lasun, Dhakayo,Tusa,Rato Chyau, Niguro, Kurilo, Satuwa, Chiraito and Lokta are most prioritized plants by the local of Narchang CAMC,In this CAMC the potential habitats of commercial species like Dhakayo, Chutro, Satuwa and Ban Lasun are higher than the other species.

Table 34: Prioritized NTFPs with their habitat and production potential in Narchang CAMC

S. N	Local name	Scientific name	Potential habitat area (ha)	Wt/Plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
1	Tusa	*Drepanostachyum falcatum*	8528	50	26.5	18.55
2	Satuwa	*Paris polyphylla*	14924	5	4.53	3.4
3	Kurilo	*Asparagus racemosus*	1251.3	12	16	11.2
4	Rato Chyaau	*Laetiporus sulphureus*	858.5	7	14	11.0
5	Dhakayo	*Arisaema speciosum*	8527	9	15	12.2
6	Chiraito	*Swertia chirayita*	6396	13	26	20.8
7	Nigalo	*Thamnocalamus spathiflorus*	1572	102	54.14	37.81
8	Ban Lasun	*Fritillaria cirrhosa*	2132	5	6.67	5.36
9	Lokta	*Daphne bholua*	8528	23	4.88	1.61
10	Niguro	*Dryopteris cochleate*	4666.7	11	36.67	29.04
11	Bojho	*Delphinium denudatum*	6396	7	14	9.8
12	Sisnu	*Urtica dioica*	4264	10	20	16

3.9.3 Jomsom UCO

Representing one of the two UCOs in Mustang district, Nepal, Jomsom UCO covers 13.0% (99,712 ha) of the ACA's land area. This UCO encompasses both cis and trans-Himalaya physiography, including nine CAMCs: Jhong, Muktinath, Kagbeni, Jomsom, Marpha, Tukuche, Kobang, Kunjo, and Lete, which represent the upper sub-tropical to nival climatic zones of Nepal. The current study identified 46 NTFPs in this UCO, with 20 being prioritized by the local population. Ban Lasun (*Allium wallichii*), Kutki (*Neopicrorhiza scrophulariiflora*), Padamchal (*Rheum australe*), and Yarshagumba (*Ophiocordyceps sinensis*) are preferred by all CAMCs within the Jomsom UCO.

Table 35: Prioritized NTFPs of Jomsom UCO with harvesting protocols

S.N.	Local Name	Scientific Name	CAMCs	Frequency	Harvesting Protocols
1.	Ban Lasun	*Allium wallichii*	9	100	Harvest only the desired portion of the plants. Dug out tubers of matured and older plants only. Replant/left the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance population.
2.	Kutki	*Neopicrorhiza scrophulariifolia*	9	100	Harvest only the desired portion of the plants. Dug out tubers of matured and older plants only. Replant/left the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance population.
3.	Padamchal/Chulthe Amilo	*Rheum australe*	9	100	Harvest leaves with petiole (Chulthi) using sharp sickle, care mother plant to survive, collect optimum 75% of the Population.
4	Yarshagumba	*Ophiocordyceps sinensis*	9	100	Harvest from May to July. Pick manually by using pointed mechanical tool (like Chuche Kuto) which disperse minimal soil while digging. Collect only the matured stalk. Reserve about 10% of the production area for sustainable regeneration

5	Setok Chini/Khiraula/Salam Mishri	*Polygonatum cirrrhifolium*	9	100	Harvest only the desired portion of the plant. Dug out tubers of matured and older plants only. Replant/left the apical portion of tubers, immature sister bulbs, the seedling part or immature plants to ensure regeneration Collect optimum 70% of the population. Operate harvesting activities within areas having abundance population
6	Dhupi	*Juniperus indica*	6	66.7	Avoid mechanical harvesting; harvest leaves using sharp sickle, care mother plant to survive. Collect optimum 80% of leaves. Avoid lopping/cutting of trees and branches during leaf collection
7	Nirmasi	*Delphinim denudatum*	6	66.7	Harvest only the desired portion of the plant. Dug out tubers of matured and older plants only. Replant/left the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance population.
8	Dale chuk	*Hippophae salicifolia*	6	66.7	Avoid mechanical harvesting; picked the fruits using hand or thrashed with a stick without damaging the branches Avoid lopping/ cutting of fruiting branches during fruit collection. Maximum allowable harvest quantity 90% of fruits. Harvest mature ripe fruits before seed dissemination
9	Lauth Salla	*Taxus wallichiana*	5	55.6	Avoid mechanical harvesting; collect bark using sharp knife and peel of the bark along tree trunk. Strict to make wound size – 20cm wide x 80 cm long x 1 cm deep and > 30 cm spaces between wounds. Extract the bark from on third (33%) proportion of the trunk
10	Sunpati	*Rhododendron anthopogon*	5	55.6	**Leaves** Avoid mechanical harvesting; harvest leaves using sharp sickle. Care mother plant to survive. Collect optimum 80% of leaves

					Avoid lopping/cutting of trees and branches during leaf collection **Flower** Avoid mechanical harvesting A maximum of 90 % percent of flowers are allowed to be harvested
11	Bhuin chuk	*Hippophae tibetana*	3	33.3	Avoid mechanical harvesting; picked the fruits using hand or thrashed with a stick without damaging the branches. Avoid lopping/cutting of fruiting branches during fruit collection. Maximum allowable harvest quantity 90% of fruits. Harvest mature ripe fruits before seed dissemination
12	Kakoli (Ban Lasun)	*Fritillaria cirrhosa*	3	33.3	Harvest leaves using sharp sickle, care mother plant to survive. Collect optimum 75% of the population.
13	Nigalo	*Thamnocalamus spathiflorus*	3	33.3	
14	Jatamansi	*Nardostachys jatamansi*	3	33.3	Harvest only the desired portion of the plant. Dug out tubers of matured and older plants only. Replant/left the apical portion of tubers, immature sister bulbs, the seeding part; or immature plants to ensure regeneration Collect optimum 70% of the population. Operate harvesting activities within areas having abundance population.
15	Bhojo	*Acorus calamus*	2	22.2	Harvest only the desired portion of the plant. Dug out tubers of matured and older plants only. Replant/left the apical portion of tubers. Immature sister bulbs, the seedling part; or immature plants to ensure regeneration Collect optimum 70% of the population. Operate harvesting activities within areas having abundance population.
16	Satuwa	*Paris polyphylla*	2	22.2	Harvest only the desired portion of the plant. Dug out tubers of matured and older plants only. Replant/left the apical portion of

					tubers, immature sister bulbs. The seedling part or immature plants to ensure regeneration Collect optimum 70% of the population. Operate harvesting activities within areas having abundance population
17	Sisnu	*Urtica dioica*	2	22.2	Harvest leaves with small twigs using sharp sickle, care mother plant to survive. Collect optimum 75% of the population.
18	Somlata	*Ephedra gerardiana*	1	11.1	Collect mature plant materials (seeds are fully formed, matured, dried and disseminated). Collect optimum 85% of the population Rotational harvesting ensuring sustainable production
19	Pakhanbed	*Bergenia ciliata*	1	11.1	Harvest only the desired portion of the plant. Dug out tubers of matured and older plants only. Replant/left the apical portion of tubers, immature sister bulbs, the seedling part or immature plants to ensure regeneration Collect optimum 70% of the population. Operate harvesting activities within areas having abundance population.
20	Panchaunle	*Dactylorhiza hatagirea*	1	11.1	Harvest only the desired portion of the plant. Dug out tubers of matured and older plants only. Replant/left the apical portion of tubers, immature sister bulbs, the seedling part or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance population.

3.9.3.1 Jhong CAMC (Jomsom UCO)

Area: 4980 ha (5% of UCO, 0.7% of ACA)

Potential NTFPs: Yarshagumba, Kutki, Nirmasi, Sumpati, Padamchal, Ban Lasun, Bhuin chuk and Dhupi

a) Ecological assessment

In Jhong CAMC, located in the Trans Himalayan region, forest areas are absent. However, the understory and ground vegetation display an ecological dominance of NTFPs. The locally preferred NTFPs recorded in this CAMC include Somlata (PV = 6.3), Bhuin chuk (PV = 0.1), and Padamchal (PV = 4.4).

Table 36: Dominance and prominence of potential plant based NTFPs in Jhong

Shrub			
Species	**Scientific name**	**Frequency**	**PV**
Kada/Talang	*Caragana sp*	0.7	36.5
Balu Rato	*Sid asp*	0.1	6.7
Somlata	*Ephedra gerardiana*	0.3	6.3
Sisnu	*Urtica dioica*	0.1	3.7
Chutro	*Berberis asiatica*	0.1	0.4
Bhuin chuk	*Hippophae tibetana*	0.1	0.1
Pati	*Artemisia sp*	0.1	0.1
Herb			
Species	**Scientific name**	**Frequency**	**PV**
Titepati	*Artemisia gmelinii*	0.1	18
Padamchal	*Rheum australe*	0.1	4.4
Titepati	*Artemisia indica*	0.1	1.5
Babiyo	*Eulaliopsis sp*	0.03	0.2

b) Prioritized species and productivity

The local community of Jhong CAMC prioritizes several plant-based NTFPs, including Yarshagumba, Kutki, Nirmasi, Sunpati, Padamchal, Ban Lasun, Bhuin chuk, Dhupi, Titepati, and Somlata. In this CAMC, the potential habitats for commercial species like Somlata, Yarshagumba, Padamchal, Kutki, and Nirmasi are more abundant compared to other species. Regarding production, all prioritized species, except Bhuin chuk, have harvestable quantities in this CAMC.

Table 37: Prioritized NTFPs with their habitat and production potential in Jhong CAMC

S.N.	Local Name	Scientific Name	Potentioal habitat area (ha)	Wt/plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
1	Yarshagumba	*Ophiocordyceps sinensis*	796.8	0.5	0.0014	0.0014
2	Kutki	*Neopicrorhiza scrophulariifolia*	398.4	580	1.392	0.696
3	Nirmasi	*Delphinium denudatum*	398.4	18	0.0864	0.0432
4	Sunpati	*Rhododendron anthopogon*	1593.6	145 (Lf)	1.44	1.008
				5 (Fl)	0.1	0.8
5	Padamchal	*Rheum australe*	996	95	0.912	0.456
6	Ban Lasun	*Allium wallichii*	398.4	12	0.038	0.0192
7	Bhuin chuk	*Hippophae tibetana*	597.6	450	1.8	0.9
8	Dhupi	*Juniperus indica*	398.4	1500	6	3
9	Titepati	*Artemisia indica*	597.6	45	0.28	0.144
10	Somlata	*Ephedra gerardiana*	796.8	150	1.2	0.6
11.	Setok Chini/Khiraula	*Polygonatum cirrrhifolium*	398.4	175	0.7	0.35

3.9.3.2 Jomsom CAMC (Jomsom UCO)

Area: 18420 ha (18.25% of UCO, 2.4% of ACA)

Potential NTFPs: Yarshagumba, Kutki, Padamchal, Sunpati, Dhupi, Ban Lasun, Bhuin chuk and Jatamasi

a) Ecological assessment

In the forest area of Jomsom CAMC, the locally preferred NTFP Dhupi (IVI = 261.0) is found in the canopy layer. Although Dale chuk has ecological potential for harvest in Jomsom CAMC, it is not considered a preferred species by the local community. Sunpati (PV = 2.7) shows significant ecological dominance in the understory layer. In the ground vegetation, Padamchal (PV = 0.5) and Kutki (PV = 0.2) are recorded with higher prominence.

Table 38: Dominance and prominence of potential plant based NTFPs in Jomsom CAMC

Tree					
Species	**Scientific name**	**RF**	**RD**	**RDO**	**IVI**
Dhupi	*Juniperus indica*	87.5	93.8	79.8	261.0
Dale chuk	*Hippophae salicifolia*	12.5	6.3	20.2	39.0
Shrub					
Species	**Scientific name**	**Frequency**		**PV**	

Bhale sunpati	*Rhododendron lepidotum*	0.3	22.6
Kada/Talang	*Caragana sp*	0.7	13.7
Pati	*Artemisia sp*	0.4	13.5
Sunpati	*Rhododendron anthopogon*	0.1	2.7
Chutro	*Barberis sp*	0.3	2.3
Somlata	*Epedra gerardiana*	0.1	0.5
Herb			
Species	**Scientific name**	**Frequency**	**PV**
Padamchal	*Rheum austral*	0.1	0.5
Kutki	*Neopicrorhiza scrophulariifolia*	0.0	0.2
Ban Lasun	*Allium wallichii*	0.2	0.1
Gandhe	*Ageratum sp*	0.03	0.05

b) Prioritized species and productivity

The local community of Jomsom CAMC prioritizes several plant-based NTFPs, including Yarshagumba, Kutki, Sunpati, Padamchal, Ban Lasun, Bhuin chuk, Dhupi, Titepati, Jatamansi, and Sisnu. In this CAMC, the habitats for commercial species such as Yarshagumba, Padamchal, Kutki, and Jatamansi are more extensive than for other species. Regarding production, all prioritized species, except Bhuin chuk, have harvestable quantities in this CAMC.

Table 39: Prioritized NTFPs with their habitat and production potential in Jomsom CAMC

S.N.	Local Name	Scientific Name	Potential habitat area (ha)	Wt/plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
1	Yarshagumba	*Ophiocordyceps sinensis*	2210.4	0.45	0.00144	0.0013
2	Kutki	*Neopicrorhiza scrophulariifolia*	1473.6	580	1.85	1.29
3	Padamchal	*Rheum australe*	3684	150	1.2	0.6
4	Sunpati	*Rhododendron anthopogon*	8841.6	98 (LF)	1.1	0.83
				2 (Fl)	0.1	0.1
5	Dhupi	*Juniperus indica*	2947.2	1500	9.6	1.92
6	Ban Lasun	*Allium wallichii*	1473.6	12	0.048	0.0336
7	Bhuin chuk	*Hippophae tibetana*	4420.8	350	3.36	0.72
8	Titepati	*Artemisia gmelinii*	5157.6	150	1.68	0.392
9	Jatamasi	*Nardostachys jatamansi*	1473.6	300	1.2	0.2
10	Lauth Salla	*Taxus wallichiana*	3684	13500	108	2.16

3.9.3.3 Kagbeni CAMC (Jomsom UCO)

Area: 28420 ha (28.5% of UCO, 3.7% of ACA)

Potential NTFPs: Yarshagumba, Kutki, Sunpati, Padamchal, Ban Lasun, Jatamasi Bhuin chuk and Dhupi

a) Ecological assessment

Forest areas are absent in Kagbeni CAMC due to its location in the Trans Himalayan region. However, NTFPs show ecological dominance in the understory and ground vegetation of this CAMC. Locally preferred NTFPs such as Sunpati (PV = 2.0) and Bhuin chuk (PV = 0.2) are prominent in the understory layer, while Padamchal (PV = 0.3) exhibits higher prominence in the ground vegetation.

Table 40: Dominance and prominence of potential plant based NTFPs in Kagbeni CAMC.

Shrub			
Species	**Scientific name**	**Frequency**	**PV**
Kada/Talang	*Caragana sp*	0.5	22.9
Bhale sunpati	*Rhododendron lepidotum*	0.1	2.6
Chutro	*Berberis aristata*	0.2	2.3
Sunpati	*Rhododendron anthopogon*	0.1	2.0
Somlata	*Ephedra gerardiana*	0.1	1.5
Pati	*Artemisia indica*	0.1	0.9
Bhuin chuk	*Hippophae tibetana*	0.1	0.2
Herb			
Species	**Scientific name**	**Frequency**	**PV**
Sisnu	*Urtica dioica*	0.0	2.1
Babiyo	*Eulaliopsis binate*	0.1	0.7
Wild strawberry	*Fragaria sp*	0.1	0.5
Padamchal	*Rheum australe*	0.03	0.3
Ghodtapre	*Centella asiatica*	0.03	0.1
Kutki	*Neopicrorhiza scrophulariifolia*	0.03	0.003
Ban lasun	*Allium wallichii*	0.3	0.003

b) Prioritized species and productivity

The local community of Kagbeni CAMC prioritizes several plant-based NTFPs, including Yarshagumba, Kutki, Sunpati, Padamchal, Ban Lasun, Bhuin chuk, Dhupi, Titepati, Jatamansi, and Sisnu. In this CAMC, the habitats for commercial species such as Yarshagumba, Padamchal, Kutki, and Jatamansi are more extensive than for other species. Regarding production, all prioritized species, except Bhuin chuk, have harvestable quantities in this CAMC.

Table 41: Prioritized NTFPs with their habitat and production potential in Kagbeni CAMC

S.N.	Local Name	Scientific Name	Potential habitat area (ha)	Wt/plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
1	Yarshagumba	*Ophiocordyceps sinensis*	3410.4	0.3	0.00096	0.000672
2	Kutki	*Neopicrorhiza scrophulariiflora*	2273.6	580	1.856	0.928
3	Padamchal	*Rheum austral*	5684.0	150	1.2	0.84
4	Sunpati	*Rhododendron anthopogon*	13641.6	90 (LF)	1.1	0.74
				10(Fl)	0.1	0.10
5	Bhuin chuk	*Hippophae tibetana*	6820.8	350	3.36	1.68
6	Dhupi	*Juniperus indica*	4547.2	1500	9.6	4.8
7	Ban Lasun	*Allium wallichii*	2273.6	12	0.048	0.024
8	Jatamansi	*Nardostachys jatamansi*	2273.6	300	1.2	0.6
9	Titepati	*Artemisia indica*	7957.6	150	1.68	0.84
10	Sisnu	*Urtica dioica*	4547.2	500	2.4	1.2
11	Setok Chini/Khiraula	*Polygonatum cirrrhifolium*	4547.2	175	0.98	0.49

3.9.3.4 Kobang CAMC (Jomsom UCO)

Area: 7980 ha (8% of UCO, 1% of ACA)

Potential NTFPs: Yarshagumba, Kutki, Padamchal, Nirmasi, Dale chuk, Lauth Salla, Ban Lasun and Pakhanbed.

a) Ecological assessment

In the forest area of Kobang CAMC, the locally preferred NTFPs Lauth Salla (IVI = 75.9) and Dale chuk (IVI = 72.8) dominate the canopy layer. Other NTFPs show ecological dominance in the understory and ground vegetation of this CAMC. Nigalo (PV = 47.8), a locally preferred NTFP, is more prominent in the understory layer, while Pachaunle (PV = 5.3) has a higher prominence in the ground vegetation.

Table 42:Dominance and prominence of potential plant based NTFPs in Kobang CAMC

Tree					
Species	**Scientific name**	**RF**	**RD**	**Rdo**	**IVI**
Lauth Salla	*Taxus wallichiana*	21.1	26.9	28.0	75.9
Dale chuk	*Hippophae salicifolia*	15.8	26.9	30.1	72.8

Gobre Salla	*Pinus Wallichiana*	5.3	3.9	4.9	14.0
Shrub					
Species	**Scientific name**	**Frequency**		**PV**	
Nigalo	*Thamnocalamus spathiflorus*	0.1		47.8	
Sunpati	*Rhododendron anthopogon*	0.2		12.4	
Bhale sunpati	*Rhododendron lepidotum*	0.2		6.1	
Chutro	*Berberis aristata*	0.1		3.2	
Ainselu	*Rubus ellipticus*	0.1		1.0	
Ghoda Marcha	*Scnecio sp.*	0.1		0.4	
Herb					
Species	**Scientific name**	**Frequency**		**PV**	
Panchaule	*Dactylorhiza hatagirea*	0.0		5.3	
Dhakayo	*Arisaema speciosum*	0.1		2.2	

b) Prioritized species and productivity

The local community of Kobang CAMC prioritizes several plant-based NTFPs, including Yarshagumba, Kutki, Padamchal, Dale chuk, Lauth Salla, Nigalo, Titepati, and Pakhanbed. In this CAMC, the habitats for commercial species such as Nirmasi, Yarshagumba, Padamchal, Kutki, and Ban Lasun are more extensive compared to other species. Regarding production, all prioritized species have harvestable quantities in this CAMC.

Table 43: Prioritized NTFPs with their habitat and production potential in Kobang CAMC

S.N.	Local Name	Scientific Name	Potential habitat area (ha)	Wt/plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
1	Yarshagumba	*Ophiocordyceps sinensis*	1276.8	0.5	0.0032	0.00224
2	Kutki	*Neopicrorhiza scrophulariiflora*	957.6	580	3.248	1.624
3	Padamchal	*Rheum austral*	2553.6	450	4.32	2.16
4	Nirmasi	*Delphinium denudatum*	638.4	32	0.1024	0.0512
5	Dale chuk	*Hippophae salicifolia*	1276.8	6055	48.44	24.22
6	Lauth Salla	*Taxus wallichiana*	1596.0	13500	129.6	25.92
7	Ban Lasun	*Allium wallichii*	1276.8	12	0.0576	0.04032
8	Nigalo	*Thamnocalamus spathiflorus*	1915.2	250	50	15

9	Jatamansi	*Nardostachys jatamansi*	1915.2	2165	43.3	12.99
10	Pakhanbed	*Bergenia ciliata*	1596.0	16820	430.592	21.52
11	Setok Chini/Khiraula	*Polygonatum cirrrhifolium*	1596.0	175	1.12	0.56

3.9.3.5 Kunjo CAMC (Jomsom UCO)

Area: 7570 ha (7.6% of UCO, 1% of ACA)

Potential NTFPs: Yarshagumba, Kutki, Padamchal, Nirmasi, Satuwa, Dale chuk, Ban Lasun and Lauth Salla.

a) Ecological assessment

In the forested area of Kunjo CAMC, the locally preferred NTFPs Lauth Salla (IVI = 60.2) and Dale chuk (IVI = 26.0) are found in the canopy layer. Other NTFPs show ecological dominance in the ground vegetation of this CAMC. Bojho (PV = 77.1) and Titepati (PV = 14.5) exhibit higher prominence in the ground vegetation.

Table 44: Dominance and prominence of potential plant based NTFPs in Kunjo CAMC

Tree					
Species	**Scientific name**	**RF**	**RD**	**RDO**	**IVI**
Gobre Salla	*Pinus Wallichiana*	37.5	31.6	34.1	103.2
Bhale sunpati	*Rhododendron lepidotum*	25.0	26.3	38.9	90.2
Lauth Salla	*Taxus wallichiana*	25.0	21.1	14.2	60.2
Dale chuk	*Hippophae salicifolia*	6.3	15.8	4.0	26.0
Bais	*Salix sp*	6.3	5.3	3.4	15.0
Shrub					
Species	**Scientific name**	**Frequency**		**PV**	
Nigalo	*Thamnocalamus spathiflorus*	0.2		20.8	
Bhale sunpati	*Rhododendron lepidotum*	0.1		6.4	
Pathi	*Artemisia indica*	0.1		3.4	
Timur	*Zanthoxylum armatum*	0.1		1.6	
Chutro	*Berberis aristata*	0.1		0.9	
Somlata	*Ephedra gerardiana*	0.1		0.9	
Ainselu	*Rubus ellipticus*	0.1		0.4	
Jamanemandro	*Mahonia sp*	0.1		0.3	
Herb					
Species	**Scientific name**	**Frequency**		**PV**	
Bojho	*Acorus calamus*	0.1		77.1	
Titepati	*Artemisia indiaca*	0.1		14.5	
Ghodtapre	*Centella asiatica*	0.2		3.9	
Ganja	*Cannabis sativa*	0.0		3.3	

Babiyo	*Allium sp*	0.1	3.2
Wild strawberry	*Fragaria sp*	0.3	3.1
Dhakayo	*Arisaema speciosum*	0.1	3.1
Banpyaj	*Allium sp*	0.1	2.0
Satuwa	*Paris polyphylla*	0.1	1.6
Kada	*Caragana sp*	0.1	0.8
Sisnu	*Urtica dioica*	0.0	0.8
Chiraito	*Swertia chirayita*	0.0	0.2
Pirejhar	*Persicaria sp*	0.1	0.1
Nirmasi	*Delphinium denudatum*	0.0	0.1

b) Prioritized species and productivity

The local community of Kunjo CAMC prioritizes several plant-based NTFPs, including Yarshagumba, Kutki, Nirmasi, Dale chuk, Satuwa, Ban Lasun, Bojho, Lauth Salla, and Titepati. In this CAMC, the habitats for commercial species such as Nirmasi, Yarshagumba, Padamchal, Ban Lasun, Lauth Salla, Kutki, and Satuwa are more extensive compared to other species. Regarding production, all prioritized species, except Padamchal, are available in harvestable quantities in this CAMC.

Table 45: Prioritized NTFPs with their habitat and production potential in Kunjo CAMC

S.N.	Local Name	Scientific Name	Potential habitat area (ha)	Wt/plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
1	Yarshagumba	*Ophiocordyceps sinensis*	1211.2	0.5	0.0024	0.00168
2	Kutki	*Neopicrorhiza scrophulariiflora*	1514.0	580	4.64	3.248
3	Nirmasi	*Delphinium denudatum*	605.6	32	0.1024	0.0512
4	Dale chuk	*Hippophae salicifolia*	605.6	1500	12	6
5	Padamchal	*Rheum australe*	1816.8	450	2.88	1.44
6	Satuwa	*Paris polyphylla*	1211.2	125	0.6	0.3
7	Ban Lasun	*Allium wallichii*	2422.4	12	0.144	0.1008
8	Nigalo	*Thamnocalamus spathiflorus*	1211.2	250	60	42
9	Lauth Salla	*Taxus wallichiana*	1816.8	13500	129.6	12.96
10	Pakhanbed	*Bergenia ciliata*	908.4	250	1.2	0.6
11	Setok Chini/Khiraula	*Polygonatum cirrrhifolium*	605.6	175	0.7	0.49

3.9.3.6 Lete CAMC (Jomsom UCO)

Area: 5080 ha (5.1% of UCO, 0.7% of ACA)

Potential NTFPs: Yarshagumba, Kutki, Padamchal, Satuwa, Dale chuk, Ban Lasun, Panchaule and Lauth Salla.

a) Ecological assessment

In the forested area of Lete CAMC, the locally preferred NTFP Dale chuk (IVI = 31.7) is found in the canopy layer. Other NTFPs, such as Nigalo (PV = 13.4), dominate the understory layer ecologically. In the ground vegetation, Sisnu (PV = 19.9) is notably prominent.

Table 46: Dominance and prominence of potential plant based NTFPs in Lete CAMC

Tree					
Species	**Scientific name**	**RF**	**RD**	**RDO**	**IVI**
Gurans	*Rhododendron sp*	35.7	54.2	42.4	132.3
Gobre Salla	*Pinus Wallichiana*	37.7	25.0	51.5	112.2
Dale chuk	*Hippophae salicifolia*	14.3	12.5	4.9	31.7
Bais	*Salix sp*	14.3	8.3	1.2	23.8
Shrub					
Species	**Scientific name**	**Frequency**		**PV**	
Bhale sunpati	*Rhododendron lepidotum*	0.2		25.5	
Nigalo	*Thamnocalamus spathiflorus*	0.3		13.4	
Chutro	*Berberis aristata*	0.3		11.2	
Ainselu	*Rubus ellipticus*	0.1		1.0	
Sunpati	*Rhododendron anthopogon*	0.1		0.7	
Gophala	*Hoiboellia latifolia*	0.1		0.1	
Herb					
Species	**Scientific name**	**Frequency**		**PV**	
Sisnu	*Utrica dioica*	0.1		19.9	
Wild Strawbery	*Fragaria sp*	0.5		8.6	
Babiyo	*Eulaiopsis sp*	0.2		6.3	
Gholtapre	*Centella asiatica*	0.3		2.8	
Pere Jhar	*Cymbopogon sp*	0.1		0.7	
Thulo kada	*Circium sp*	0.1		0.6	
Titepati	*Artemisia indica*	0.1		0.3	
Banpyaj	*Allium sp*	0.1		0.3	
Chari Amilo	*Oxalis sp*	0.03		0.2	

b) Prioritized species and productivity

The local community of Lete CAMC prioritizes several plant-based NTFPs, including Yarshagumba, Kutki, Bojho, Satuwa, Padamchal, Ban Lasun, Dale chuk, Lauth Salla, Nigalo, and Pachaunle. In this CAMC, the habitats for commercial species such as Lauth Salla, Satuwa, Yarshagumba, Padamchal, and Ban Lasun are more extensive compared to other species. Regarding production, all prioritized species are available in harvestable quantities in this CAMC.

Table 47: Prioritized NTFPs with their habitat and production potential in Lete CAMC

S.N.	Local Name	Scientific Name	Potential habitat area (ha)	Wt/plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
1	Yarshagumba	*Ophiocordyceps sinensis*	609.6	0.45	0.0018	0.00126
2	Kutki	*Neopicrorhiza scrophulariiflora*	609.6	580	1.856	1.1136
3	Bojho	*Acorus calamus*	406.4	45	0.144	0.072
4	Satuwa	*Paris polyphylla*	203.2	15	0.024	0.012
5	Padamchal	*Rheum australe*	1219.2	450	4.32	2.16
6	Ban Lasun	*Allium wallichii*	812.8	12	0.0576	0.04032
7	Dale chuk	*Hippophae salicifolia*	812.8	800	2.56	1.792
8	Lauth Salla	*Taxus wallichiana*	609.6	13500	64.8	45.36
9	Nigalo	*Thamnocalamus spathiflorus*	2438.4	450	140	45
10	Panchaunle	*Dactylorhiza hatagirea*	406.4	5	0.008	0.004
11	Setok Chini/Khiraula	*Polygonatum cirrrhifolium*	609.6	175	0.7	0.49

3.9.3.7 Marpha CAMC (Jomsom UCO)

Area: 9150 ha (9.2% of UCO, 1.2% of ACA)

Potential NTFPs: Yarshagumba, Kutki, Padamchal, Sunpati, Dhupi, Nirmasi, Padamchal and Ban Lasun.

a) Ecological assessment

In the forested area of Marpha CAMC, the locally favored NTFPs Dhupi (IVI = 162.9) and Lauth Salla (IVI = 55.6) are found in the canopy layer. Other NTFPs exhibit ecological dominance in the ground vegetation of this CAMC. Padamchal (PV = 0.3) shows notable prominence in the ground vegetation.

Table 48: Dominance and prominence of potential plant based NTFPs in Marpha CAMC

Tree					
Species	**Scientific name**	**RF**	RD	Rdo	IVI
Dhupi	*Juniperus indica*	50.0	56.0	56.9	162.9

Lauth Salla	*Taxus wallichiana*	14.3	24.0	17.3	55.6
Shrub					
Species	**Scientific name**	**Frequency**		**PV**	
Chutro	*Berberis aristate*	0.3		27.6	
Kada/Talang	*Caragana sp*	0.4		15.8	
Balu Rato	*Sida sp*	0.1		10.2	
Aaru	*Pyrus sp*	0.1		0.7	
Nigalo	*Thamnocalamus spathiflorus*	0.1		0.6	
Somlata	*Ephedra gerardiana*	0.1		0.4	
Bhuin chuk	*Hippophae tibetana*	0.1		0.3	
Kalo Ainselu	*Rubus ellipticus*	0.1		0.2	
Herb					
Species	**Scientific name**	**Frequency**		**PV**	
Ganja	*Cannabis sativa*	0.0		1.7	
Wild Strawbery	*Fragaria sp*	0.2		1.6	
Titepati	*Artemisia indica*	0.1		0.4	
Padamchal	*Rheum australe*	0.0		0.3	
Ban Lasun	*Allium wallichii*	0.1			

b) Prioritized species and productivity

The local community of Marpha CAMC prioritizes several plant-based NTFPs, including Yarshagumba, Kutki, Sunpati, Dale chuk, Padamchal, Lauth Salla, Dhupi, Nirmasi, Ban Lasun, and Titepati. In this CAMC, the habitats for commercial species such as Padamchal, Nirmasi, Yarshagumba, and Kutki are more extensive compared to other species. Regarding production, all prioritized species are available in harvestable quantities in this CAMC.

Table 49: Prioritized NTFPs with their habitat and production potential in Marpha CAMC

S.N.	Local Name	Scientific Name	Potentioal habitat area (ha)	Wt/plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
1	Yarshagumba	*Ophiocordyceps sinensis*	1464.0	0.45	0.00252	0.001764
2	Kutki	*Neopicrorhiza scrophulariiflora*	732.0	580	1.392	0.696
3	Sunpati	*Rhododendron anthopogon*	1098	140(Lf)	0.76	0.48
				10(fl)	0.10	0.10
4	Dale chuk	*Hippophae salicifolia*	1464.0	1500	9.6	4.8
5	Lauth Salla	*Taxus wallichiana*	1098.0	13500	64.8	32.4

S.N.	Local Name	Scientific Name	Potentioal habitat area (ha)	Wt/plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
6	Dhupi	*Juniperus indica*	732.0	3050	12.2	6.1
7	Nirmasi	*Delphinium denudatum*	732.0	32	0.1024	0.07168
8	Padamchal	*Rheum australe*	1830.0	250	2	1
9	Ban Lasun	*Allium wallichii*	732.0	12	0.048	0.0336
10	Titepati	*Artemisia indica*	732.0	150	0.6	0.42
11.	Setok Chini/Khiraula	*Polygonatum cirrrhifolium*	1464.0	175	0.98	0.49

3.9.3.8 Muktinath CAMC (Jomsom CAMC)

Area: 5930 ha (5.9 % of UCO, 0.8% of ACA)

Potential NTFPs: Yarshagumba, Kutki, Padamchal, Sunpati, Nirmasi, Dhupi, Padamchal, Bhuin chuk, Jatamasi and Ban Lasun.

a) Ecological assessment

In the forested area of Muktinath CAMC, the locally favored NTFP Dhupi (IVI = 200.9) dominates the canopy layer. Although Bhojpatra has potential for harvest in Muktinath CAMC ecologically, it is not preferred by the local community. Other NTFPs show ecological dominance in the understory and ground vegetation of this CAMC. Padamchal (PV = 8.5) is notably prominent in the understory layer. In the ground vegetation, Padamchal (PV = 0.8) and Ban Lasun (PV = 0.3) exhibit high prominence.

Table 50: Dominance and prominence of potential plant based NTFPs in Muktinath CAMC

Tree					
Species	**Scientific name**	**RF**	**RD**	**Rdo**	**IVI**
Dhupi	*Juniperus indica*	68.8	68.8	63.4	200.9
Gobre Salla	*Pinus Wallichiana*	18.8	18.8	20.8	58.3
Bhojpatra	*Betula utilis*	12.5	12.5	15.8	40.8
Shrub					
Species	**Scientific name**	**Frequency**		**PV**	
Kada/Talang	*Caragana sp*	0.6		17.0	
Pathi	*Artemisia indica*	0.5		11.3	
Sunpati	*Rhododendron anthopogon*	0.3		8.5	
Chutro	*Berberis sp*	0.3		6.6	
Bhale sunpati	*Rhododendron lepidotum*	0.1		2.2	
Somlata	*Ephedra gerardiana*	0.07		2.2	
Herb					
Species	**Scientific name**	**Frequency**		**PV**	

Padamchal	*Rheum australe*	0.1	0.8
Ban Lasun	*Allium wallichii*	0.1	0.3
Kutki	*Neopicrorhiza scrophularlifolia*	0.03	0.1
Titepati	*Artemisia indica*	0.1	0.1

b) Prioritized species and productivity

The local community of Muktinath CAMC prioritizes several plant-based NTFPs, including Yarshagumba, Kutki, Nirmasi, Sunpati, Padamchal, Dhupi, Ban Lasun, Bhuin chuk, Jatamasi, and Titepati. In this CAMC, the habitats for commercial species such as Padamchal, Nirmasi, Yarshagumba, Jatamasi, and Kutki are more extensive compared to other species. Regarding production, all prioritized species are available in harvestable quantities in this CAMC.

Table 51: Prioritized NTFPs with their habitat and production potential in Muktinath CAMC

S.N.	Local Name	Scientific Name	Potential habitat area (ha)	Wt/plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
1	Yarshagumba	*Ophiocordyceps sinensis*	948.8	0.45	0.0018	0.00126
2	Kutki	*Neopicrorhiza scrophulariiflora*	474.4	580	1.392	0.9744
3	Nirmasi	*Delphinium denudatum*	948.8	18	0.0864	0.06048
4	Sunpati	*Rhododendron anthopogon*	2372	140(lf)	1.82	1.24
				10(FL)	0.1	0.1
5	Padamchal	*Rheum australe*	1423.2	450	4.32	3.024
6	Dhupi	*Juniperus indica*	474.4	3095	12.38	8.666
7	Ban Lasun	*Allium wallichii*	474.4	18	0.0576	0.04032
8	Bhuin chuk	*Hippophae tibetana*	948.8	450	1.8	1.26
9	Titepati	*Artemisia indica*	711.6	250	1.6	1.12
10	Sisnu	*Utrica dioica*	948.8	150	1.2	0.84
11.	Setok Chini/Khiraula	*Polygonatum cirrrhifolium*	474.4	175	0.7	0.49

3.9.3.9 Tukuche CAMC (Jomsom UCO)

Area: 12210 ha (12.2% of UCO, 1.6% of ACA)

Potential NTFPs: Yarshagumba, Kutki, Dale chuk, Nirmasi, Lauth Salla, Padamchal, Dhupi and Ban Lasun

a) Ecological assessment

In the forested area of Tukuche CAMC, the locally favored NTFPs Dhupi (IVI = 113.9), Dale chuk (IVI = 41.2), and Lauth Salla (IVI = 23.2) are found in the canopy layer. Other NTFPs exhibit ecological dominance in the ground vegetation of this CAMC. Titepati (PV = 0.4) shows high prominence in the ground vegetation.

Table 52: Dominance and prominence of potential plant based NTFPs in Tukuche CAMC

Tree					
Species	**Scientific name**	**RF**	**RD**	**RDO**	**IVI**
Dhupi	*Juniperus indica*	31.3	43.5	39.1	113.9
Gobre Salla	*Pinus Wallichiana*	31.3	21.7	30.2	83.2
Dale chuk	*Hippophae salicifolia*	6.3	13.0	21.9	41.2
Talis patra	*Abies spectabilis*	12.5	8.7	5.5	26.7
Lauth Salla	*Taxus wallichiana*	12.5	8.7	2.01	23.2
Chimal	*Thododendron sp*	6.3	4.4	1.4	11.9
Shrub					
Species	**Scientific name**	**Frequency**		**PV**	
Bhale sunpati	*Rhododendron lepidotum*	0.2		16.3	
Timur	*Zanthoxylum armatum*	90’0.1		4.2	
Nigalo	*Thamnocalamus spathiflorus*	0.3		1.9	
Chutro	*Berberis aristata*	0.1		1.1	
Ainselu	*Rubus ellipticus*	0.1		0.3	
Herb					
Species	**Scientific name**	**Frequency**		**PV**	
Wild Strawbery	*Fragaria sp*	0.2		0.9	
Ganja	*Cannabis sativa*	0.1		0.7	
Titepati	*Artemisia indica*	0.1		0.4	
Dhakayo	*Arisaema speciosum*	0.03		0.3	
Chyau	*Agaricus sp*	0.03		0.3	
Gholtapre	*Centella asiatica*	0.03		0.2	
Banpyaj	*Allium sp*	0.1		0.1	
Chiraito	*Swertia chirayita*	0.1		0.1	
Babiyo	*Eulaliopsis sp*	0.03		0.1	
Nirmasi	*Delphinium denudatum*	0.03		0.04	

b) Prioritized species and productivity

The local community of Tukuche CAMC prioritizes several plant-based NTFPs, including Yarshagumba, Kutki, Dale chuk, Nirmasi, Lauth Salla, Padamchal, Dhupi, Nigalo, Ban Lasun, and Titepati. In this CAMC, the habitats for commercial species such as Padamchal, Nirmasi, Yarshagumba, Lauth Salla, and Kutki are more extensive compared to other species. Regarding production, all prioritized species are available in harvestable quantities in this CAMC.

Table 53: Prioritized NTFPs with their habitat and production potential in Tukuche CAMC

S.N.	Local Name	Scientific Name	Potentioal habitat area (ha)	Wt/plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
1	Yarshagumba	*Ophiocordyceps sinensis*	2442.0	0.5	0.0016	0.00112
2	Kutki	*Neopicrorhiza scrophulariiflora*	2930.4	580	3.712	1.856
3	Dale chuk	*Hippophae salicifolia*	1953.6	6055	38.752	19.376
4	Nirmasi	*Delphinium denudatum*	1953.6	32	0.128	0.0896
5	Lauth Salla	*Taxus wallichiana*	5372.4	13500	140.4	14.04
6	Padamchal	*Rheum australe*	2930.4	450	2.52	1.26
7	Dhupi	*Juniperus indica*	3907.2	16820	242.208	24.22
8	Nigalo	*Thamnocalamus spathiflorus*	1465.2	250	30	15
9	Ban Lasun	*Allium wallichii*	1953.6	12	0.096	0.0672
10	Titepati	*Artemisia indica*	2930.4	2165	13.856	6.928
11	Setok Chini/Khiraula	*Polygonatum cirrrhifolium*	2442.0	175	2.24	1.12

3.9.4 Lomanthang UCOs

Representing one of the two UCOs in Mustang district, Nepal, Lomanthang is the largest UCO, covering 33.0% (255,091 ha) of the ACA's land area. This UCO fully encompasses the trans-Himalayan physiography with a cold arid climate, including the seven CAMCs of Lomanthang, Chhuksang, Chhohnup, Ghami, Surkhang, Tsarang, and Chhoser, all of which represent Nepal's nival climatic zones. The current study identified 25 NTFPs in this UCO, with 15 being prioritized by the local population. Jimbu (*Allium hypsistum*), Kutki (*Neopicrorhiza scrophulariifolia*), Padamchal (*Rheum australe*), Sunpati (*Rhododendron anthopogon*), Titepati (*Artemisia gmelinii*), Bhuin chuk (*Hippophae tibetana*), and Yarshagumba (*Ophiocordyceps sinensis*) are preferred by all CAMCs within the Lomanthang UCO.

Table 54: Prioritized NTFPs of Lomanthang UCO with Harvesting Protocols.

S.N.	Local Name	Scientific Name	CAMCs	Frequency	Harvesting Protocols
1	Jimbu	*Allium hypsistum*	7	100.0	Harvest leaves using sharp sickle, care mother plant to survive. Collect optimum 75% of the population.
2	Kutki	*Neopicrorhiza scrophulariifolia*	7	100.0	Harvest only the desired portion of the plant. Dug out tubers of matured and older plants only. Replant/left the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance population.
3	Padamchal	*Rheum australe*	7	100.0	Harvest leaves with Petiole (Chulthi) using sharp sickle, care mother plant to survive. Collect optimum 75% of the population.
4	Sunpati	*Rhododendron anthopogon*	7	100.0	**Leaves** Avoid mechanical harvesting; harvest leaves using sharp sickle, care mother plant to survive. Collect optimum 80% of leaves. Avoid lopping/cutting of trees and branches during leaf collection. **Flower** Avoid mechanical harvesting. A maximum of 90 % of flowers are allowed to be harvested.

S.N.	Local Name	Scientific Name	CAMCs	Frequency	Harvesting Protocols
5	Titepati	*Artemisia gmelinii*	7	100.0	Collect mature plant materials (seeds are fully formed, matured, dried and disseminated.) Collect optimum 85% of leaves. Rational harvesting ensuring sustainable production.
6	Bhuin chuk	*Hippophae tibetana*	7	100.0	Avoid Mechanical Harvesting; picked the fruits using hand or thrashed with a stick without damaging the branches. Avoid lopping/cutting of fruit branching during fruit collection. Maximum allowable harvest quantity 90% of fruits. Harvest mature ripe fruits before seed dissemination.
7	Yarshagumba	*Ophiocordyceps sinensis*	7	100.0	Harvest from May to July. Pick manually by using pointed mechanical tool (like chuche kuto) which disperse minimal soil while digging. Collect only the mature stalk. Reserve about 10% of the production area for sustainable regeneration.
8	Ban Lasun	*Allium wallichii*	6	85.7	Harvest only the desired portion of the plant. Dug out tubers of matured and older plants only. Replant/left the apical portion of tubers, immature sister bulbs, the seedling part, or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance population.
9	Chiraito	*Swertia chirayita*	4	57.1	Collect mature plant materials (seeds are fully formed, matured, dried and disseminated.) Collect optimum 85% of leaves. Rational harvesting ensuring sustainable production.
10	Rosa	*Rosa sericea*	3	42.9	

S.N.	Local Name	Scientific Name	CAMCs	Frequency	Harvesting Protocols
11	Niramasi	*Delphinium denudatum*	2	28.6	Harvest only the desired portion of the plant. Dug out tubers of matured and older plants only. Replant/left the apical portion of tubers, immature sister bulbs, the seedling part, or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance population.
12	Somlata	*Ephedra gerardiana*	2	28.6	Collect mature plant materials (seeds are fully formed, matured, dried and disseminated.) Collect optimum 85% of leaves. Rational harvesting ensuring sustainable production.
13	Jatamansi	*Nardostachys jatamansi*	2	28.6	Harvest only the desired portion of the plant. Dug out tubers of matured and older plants only. Replant/left the apical portion of tubers, immature sister bulbs, the seedling part, or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance population.
14	Ganja	*Cannibas sativa*	1	14.3	Collect mature plant materials (seeds are fully formed, matured, dried and disseminated.) Collect optimum 85% of leaves. Rational harvesting ensuring sustainable production.
15	Lichen	*Usnea aciculifera*	1	14.3	

3.9.4.1 Lomanthang CAMC (UCO Lomanthang

Area: 28160 ha (11% of UCO, 3.7% of ACA)

Potential NTFPs: Yarshagumba, Sunpati, Kutki, Padamchal, Bhuin chuk, Jimbu, Chiraito and Nirmasi

a) Ecological assessment

In Lomanthang CAMC, there are no forested areas. Instead, ecological dominance of NTFPs occurs in the understory and ground vegetation. Locally favored NTFPs such as Bhuin chuk (PV = 2.12) and Sunpati (PV = 3.24) are prominent in the shrub layer. In the ground vegetation, Kutki (PV = 4.24), Padamchal (PV = 1.58), and Jimbu (PV = 1.41) show higher prominence.

Table 55: Dominance and Prominence of Potential plant based NTFPs in Lomanthang CAMC

Shrub			
Species	**Scientific Name**	**Frequency**	**PV**
Bhuin chuk	*Hippophae tibetana*	0.2	2.44
Sunpati	*Rhododendron anthopogon*	0.3	3.24
Herb			
Kutki	*Neopicrorhiza scrophulariifolia*	0.6	4.24
Titepati	*Artemisia gemelinii*	0.1	1.58
Padamchal	*Rheum australe*	0.1	1.58
Jimbu	*Allium hypsistum*	0.1	1.41

b) Prioritized species and productivity

The local communities of Lomanthang CAMC prioritize several plant-based NTFPs, including Yarshagumba, Sunpati, Kutki, Padamchal, Bhuin chuk, Titepati, Jimbu, Chiraito, Lichen, and Niramasi. In this CAMC, the habitats for commercial species such as Yarshagumba, Kutki, Sunpati, and Padamchal are more extensive compared to other species. Regarding production, all prioritized species, except Lichens, are available in harvestable quantities in this CAMC.

Table 56: Prioritized NTFPS with their habitat and production potential in Lomanthang CAMC

S.N.	Local Name	Scientific Name	Potential Habitat Area (ha)	Wt/Plant (gm)	Wt/Ha (Kg)	Sustainable amount to harvest (Kg/Ha)
1	Yarshagumba	*Ophiocordyceps sinensis*	1408	0.5	0.025	0.022
2	Sunpati	*Rhododendron anthopogon*	3637.1	56 (Lf)	4.46	2.68
				0.81 (Fl)	0.06	0.04
3	Kutki	*Neopicrorhiza scrophulariifolia*	3636.6	0.8	1.4	0.84
4	Padamchal	*Rheum australe*	1180.8	12	4.5	2.7
5	Bhuin chuk	*Hippophae tibetana*	450.2	6.8	6.8	4.08
6	Jimbu	*Allium hypsistum*	1795.6	4.6	2.3	1.38
7	Chiraito	*Swertia chirayita*	19.9	24.8	3.1	1.86
8	Nirmasi	*Delphinium denudatum*	324.2	15.4	3.85	2.31
9	Titepati	*Artemisia gmelinii*	2451.1	10	2.5	1.5

3.9.4.2 Chhoser CAMC (Lomanthang UCO)

Area: 34390 ha (13.5% of UCO, 4.5% of ACA)

Potential NTFPs: Yarshagumba, Sunpati, Kutki, Padamchal, Bhuin chuk, Ban Lasun, Jimbu, Chiraito and Jatamasi.

a) Ecological assessment

Chhoser CAMC in Lomanthang UCO, situated in the trans-Himalayan region of Nepal, lacks forested areas. However, ecological dominance of NTFPs is observed in the understory and ground vegetation of this CAMC. Locally favored NTFPs such as Bhuin chuk (PV = 3.46) and Sunpati (PV = 1.41) are prominent in the understory layer. In the ground vegetation, Padamchal (PV = 1.41), Titepati (PV = 2.73), Kutki (PV = 2.44), Jimbu (PV = 2.44), and Ban Lasun (PV = 2.23) exhibit higher prominence.

Table 57: Dominance and Prominence of Potential plant based NTFPs in Chhoser CAMC

Shrub			
Species	**Scientific Name**	**Frequency**	**PV**
Bhuin chuk	*Hippophae tibetana*	0.2	3.46
Sunpati	*Rhododendron anthopogon*	0.1	1.41
Herb			
Kutki	*Neopicrorhiza scrophulariifolia*	0.2	2.44
Titepati	*Artemisia gemelinii*	0.3	2.73

Padamchal	*Rheum australe*	0.1	1.41
Jimbu	*Allium hypsistum*	0.3	2.44
Ban Lasun	*Allium wallichii*	0.2	2.23

b) Prioritized species and productivity

Most prioritized plant based NTFPs by the local community of Chhosser CAMC are Yarshagumba, Kutki, Padamchal Sunpati, Ban Lasun, Jimbu, Bhuin chuk, Titepati, Chiraito and Jatamas. In this CAMC the potential habitats of the commercial species like Yarshagumba, Jatamasi, Kutki and Sunpati are higher than other species. In terms of production all prioritized species have harvestable quantity in this CAMC.

Table 58: Prioritized NTFPS with their habitat and production potential in Chhoser CAMC

SN	Local Name	Scientific Name	Potential Habitat Area (Ha)	Wt/Plant (gm)	Wt/Ha (Kg)	Sustainable amount to harvest (Kg/Ha)
1	Yarshagumba	*Ophiocordyceps sinensis*	1264.4	0.5	0.023	0.02
2	Sunpati	*Rhododendron anthopogon*	684.1	7.8 (Lf)	3.90	2.34
				1.87 (Fl)	0.94	0.56
3	Kutki	*Neopicrorhiza scrophulariifolia*	684.1	0.8	1.80	1.08
4	Ban Lasun	*Allium wallichii*	189	1.1	1.79	1.07
5	Padamchal	*Rheum austral*	18.2	15.5	5.81	3.49
6	Bhuin chuk	*Hippophae tibetana*	207.1	17.7	2.82	1.69
7	Jimbu	*Allium hypsistum*	492.4	6.7	6.70	4.02
8	Chiraito	*Swertia chirayita*	102.5	24.8	3.10	1.86
9	Jatamansi	*Nardostachys jatamansi*	1264.4	17.3	2.16	1.30
10	Titepati	*Artemisia gmelinii*	302.3	6	3.00	1.80

3.9.4.3 Chhonhup CAMC (Lomanthang UCO)

Area: 9810 ha (3.8% of UCO, 1.3% of ACA)

Potential NTFPs: Yarshagumba, Kutki, Padamchal, Sunpati, Ban Lasun, Bhuin chuk, Jimbu, Chiraito and Jatamansi.

a) Ecological assessment

The less forest areas in the trans himalayan region resulted no representation of tree in the canopy. Ecological dominancy of other NTFPs is available in the understory and ground vegetation of this CAMC. Locally preferred NTFPs Bhuin chuk (PV= 2.44) and Sunpati (PV= 2) are more prominence

in understory layer. In the ground vegetation higher prominence of the Titepati (PV= 2.73), Kutki (PV= 2.23), Ban Lasun (PV= 2.44), Jimbu (PV= 2.22) and Padamchal (PV= 1.22) are recorded.

Table 59: Dominance and Prominence of Potential plant based NTFPs in Chhonhup CAMC

Shrub			
Species	**Scientific Name**	**Frequency**	**PV**
Bhuin chuk	*Hippophae tibetana*	0.2	2.44
Sunpati	*Rhododendron anthopogon*	0.2	2
Herb			
Kutki	*Neopicrorhiza scrophulariifolia*	0.25	2.23
Titepati	*Artemisia gemelinii*	0.3	2.73
Padamchal	*Rheum australe*	0.15	1.22
Jimbu	*Allium hypsistum*	0.3	2.22
Ban Lasun	*Allium wallichii*	0.3	2.44

b) Prioritized species and productivity

Yarshagumba, Kutki, Padamchal, Sunpati, Ban Lasun, Titepati, Bhuin chuk, Jimbu, Chiraito and Jatamasi are most prioritized plant based NTFPs by the local community of chhonhup CAMC. In this CAMC the potential habitats of the commercial species like Yarshagumba, Jatamasi, Sunpati and Kutki are higher than other species. In terms of production all prioritized species have harvestable quantity in this CAMC.

Table 60: Prioritized NTFPS with their habitat and production potential in Chhonhup CAMC

SN	**Local Name**	**Scientific Name**	**Potential Habitat Area (ha)**	**Wt/Plant (gm)**	**Wt/Ha (Kg)**	**Sustainable amount to harvest (Kg/Ha)**
1	Yarshagumba	*Ophiocordyceps sinensis*	3602.7	0.5	0.01	0.009
2	Sunpati	*Rhododendron anthopogon*	2764.1	3.60	0.87	0.52
				1.09	0.26	0.16
3	Kutki	*Neopicrorhiza scrophulariifolia*	2764.1	0.8	2.2	1.32
4	Padamchal	*Rheum australe*	647.8	17.4	6.525	3.915
5	Bhuin chuk	*Hippophae tibetana*	432.5	8.1	3.87	2.32
6	Jimbu	*Allium hypsistum*	1492.5	1.3	3.575	2.145
7	Chiraito	*Swertia chirayita*	476	23.3	5.825	3.495
8	Ban lasun	*Allium wallichii*	1212	1.1	2.475	1.485
9	Jatamasi	*Delphinium denudatum*	3602.7	17.3	4.325	2.595
10	Titepati	*Artemisia gmelinii*	1518.3	3.8	4.75	2.85

3.9.4.4 T-sarang CAMC (Lomanthang UCO)

Area: 32250 ha (12.6% of UCO, 4.2% of ACA)

Potential NTFPs: Yarshagumba, Kutki, Sunpati, Padamchal, Bhuin chuk and Jimbu

a) Ecological assessment

Forest area is absent in T-sarang CAMC of ACA. Ecological dominancy of NTFPs is available in the understory and ground vegetation of this CAMC. Locally preferred NTFPs Bhuin chuk (PV= 2.12) and Sunpati (PV= 2.23) are more prominence in understory layer. In the ground vegetation higher prominence of the Titepati (PV=3.35), Kutki (PV= 3.16), Ban Lasun (PV= 2.73), Jimbu (PV= 2.23) and Padamchal (PV= 1.22) are recorded.

Table 61: Dominance and Prominence of Potential plant based NTFPs in T-sarang CAMC.

Shrub			
Species	**Scientific Name**	**Frequency**	**PV**
Bhuin chuk	*Hippophae tibetana*	0.15	2.12
Sunpati	*Rhododendron anthopogon*	0.2	2.23
Herb			
Kutki	*Neopicrorhiza scrophulariifolia*	0.25	3.16
Titepati	*Artemisia gemelinii*	0.25	3.35
Padamchal	*Rheum australe*	0.1	1.22
Jimbu	*Allium hypsistum*	0.25	2.23
Ban Lasun	*Allium wallichii*	0.3	2.73

b) Prioritized species and productivity

Yarshagumba, Kutki, Padamchal, Sunpati, Ban Lasun, Titepati, Bhuin chuk, Jimbu, Somlata and Rosa are most prioritized plant based NTFPs by the local community of chhonhup CAMC. In this CAMC the potential habitats of the commercial species like Yarshagumba, Padamchal, Sunpati and Kutki are higher than other species. In terms of production all prioritized species have harvestable quantity in this CAMC.

Table 62: Prioritized NTFPS with their habitat and production potential in T-sarang CAMC

SN	**Local Name**	**Scientific Name**	**Potential Habitat Area (ha)**	**Wt/Plant (gm)**	**Wt/Ha (Kg)**	**Sustainable amount to harvest (Kg/Ha)**
1	Yarshagumba	*Ophiocordyceps sinensis*	1561.6	0.5	0.02	0.018
2	Sunpati	*Rhododendron anthopogon*	1311.3	8.91 (Lf)	2.84	1.70
				0.87 (Fl)	0.27	0.16

SN	Local Name	Scientific Name	Potential Habitat Area (ha)	Wt/Plant (gm)	Wt/Ha (Kg)	Sustainable amount to harvest (Kg/Ha)
3	Kutki	*Neopicrorhiza scrophulariifolia*	1304	0.8	1.70	1.02
4	Padamchal	*Rheum australe*	528.1	12	7.50	4.50
5	Bhuin chuk	*Hippophae tibetana*	387.4	19.8	2.36	1.42
6	Jimbu	*Allium hypsistum*	637.1	3.1	2.71	1.63
7	Ban lasun	*Allium walichii*	112.4	0.6	2.10	1.26
8	Somlata	*Ephedra gerardiana*	1074.3	13.3	4.99	2.99
9	Titepati	*Artemisia gmelinii*	1205.3	3	3.00	1.80
10	Rosa	*Rosa sericea*	1204.3	1	1.25	0.75

3.9.4.5 Surkhang CAMC (Lomanthang UCO)

Area: 70560 ha (31.2% of UCO, 10.4% of ACA)

Potential NTFPs: Yarshagumba, Sunpati, Padamchal, Kutki, Bhuin chuk, Jimbu and Chiraito.

a) Ecological assessment

Forest area is absent in Surkhang CAMC of ACA. Ecological dominancy of NTFPs is available in the understory and ground vegetation of this CAMC. Locally preferred NTFPs Bhuin chuk (PV= 1.5) and Sunpati (PV= 1.22) are more prominence in understory layer. In the ground vegetation higher prominence of the Titepati (PV=2.12), Kutki (PV= 2.82), Padamchal (PV= 1.58), Ban Lasun (PV= 3.24) and Jimbu (PV= 1.58) and are recorded.

Table 63: Dominance and Prominence of Potential plant based NTFPs in Surkhang CAMC

Shrub			
Species	**Scientific Name**	**Frequency**	**PV**
Bhuin chuk	*Hippophae tibetana*	0.15	1.5
Sunpati	*Rhododendron anthopogon*	0.1	1.22
Herb			
Titepati	*Artemisia gemelinii*	0.1	2.12
Kutki	*Neopicrorhiza scrophulariifolia*	0.2	2.82
Padamchal	*Rheum australe*	0.1	1.58
Ban Lasun	*Allium wallichii*	0.3	3.24
Jimbu	*Allium hypsistum*	0.25	1.58

b) Prioritized species and productivity

Yarshagumba, Kutki, Padamchal, Sunpati, Ban Lasun, Titepati, Bhuin chuk, Jimbu, Chiraito and Rosa are most prioritized plant based NTFPs by the local community of Surkhang CAMC. In this CAMC the potential habitats of the commercial species like Yarshagumba, Padamchal, Sunpati and Kutki are higher than other species. In terms of production all prioritized species have harvestable quantity in this CAMC.

Table 64: Prioritized NTFPS with their habitat and production potential in Surkhang CAMC

SN	Local Name	Scientific Name	Potential Habitat Area (ha)	Wt/Plant (gm)	Wt/Ha (Kg)	Sustainable amount to harvest (Kg/Ha)
1	Yarshagumba	*Ophiocordyceps sinensis*	3978	0.4	0.01	0.008
2	Sunpati	*Rhododendron anthopogon*	5848.7	9.8 (Lf)	1.56	0.94
				0.8 (Fl)	0.13	0.08
3	Kutki	*Neopicrorhiza scrophulariifolia*	5848.7	0.8	2.20	1.32
4	Padamchal	*Rheum australe*	1359.4	11	4.13	2.48
5	Bhuin chuk	*Hippophae tibetana*	1672.1	12.8	2.04	1.22
6	Jimbu	*Allium hypsistum*	709.4	4.6	2.88	1.73
7	Ban lasun	*Allium walichii*	3562.2	0.9	2.70	1.62
8	Chiraito	*Swertia chirayita*	154.3	12	3.00	1.80
9	Titepati	*Artemisia gmelinii*	1432.2	3	2.63	1.58
10	Rosa	*Rosa sericea*	504.3	1	1.63	0.98

3.9.4.6 Ghami CAMC (Lomanthang UCO)

Area: 22050 ha (8.6% of UCO, 2.9% of ACA)

Potential NTFPs: Yarshagumba, Sunpati, Padamchal, Kutki, Bhuin chuk and Jimbu

a) Ecological assessment

Forest area is absent in Ghami CAMC of ACA. Ecological dominancy of NTFPs is available in the understory and ground vegetation of this CAMC. Locally preferred NTFPs Bhuin chuk (PV= 2.44) and Sunpati (PV= 1.22) are more prominence in understory layer. In the ground vegetation higher prominence of the Kutki (PV= 3.46), Titepati (PV=1.73), Padamchal (PV= 2.44), Jimbu (PV= 2.83) and Ban Lasun (PV= 1.74) are recorded.

Table 65: Dominance and Prominence of Potential plant based NTFPs in Ghami CAMC.

Shrub			
Species	**Scientific Name**	**Frequency**	**PV**
Bhuin chuk	*Hippophae tibetana*	0.2	2.44
Sunpati	*Rhododendron anthopogon*	0.15	1.22
Herb			
Kutki	*Neopicrorhiza scrophulariifolia*	0.2	3.46
Titepati	*Artemisia gemelinii*	0.15	1.73
Padamchal	*Rheum australe*	0.3	2.44
Jimbu	*Allium hypsistum*	0.2	2.83
Ban Lasun	*Allium wallichii*	0.1	1.74

b) Prioritized species and productivity

Yarshagumba, Kutki, Padamchal, Sunpati, Ban Lasun, Titepati, Bhuin chuk, Jimbu, Somlata and Rosa are most prioritized plant based NTFPs by the local community of Ghami CAMC. In this CAMC the potential habitats of the commercial species like Yarshagumba, Padamchal, Sunpati and Kutki are higher than other species. In terms of production all prioritized species have harvestable quantity in this CAMC.

Table 66: Prioritized NTFPS with their habitat and production potential in Ghami CAMC.

SN	**Local Name**	**Scientific Name**	**Potential Habitat Area (ha)**	**Wt/Plant (gm)**	**Wt/Ha (Kg)**	**Sustainable amount to harvest (Kg/Ha)**
1	Yarshagumba	*Ophiocordyceps sinensis*	2879.6	0.5	0.01`	0.008
2	Sunpati	*Rhododendron anthopogon*	2609.7	10.92	2.61	1.56
				1.87	0.45	0.27
3	Kutki	*Neopicrorhiza scrophulariifolia*	2547.4	0.8	2.50	1.50
4	Padamchal	*Rheum australe*	1943.9	28	10.50	6.30
5	Bhuin chuk	*Hippophae tibetana*	807.2	15.8	5.66	3.40
6	Jimbu	*Allium hypsistum*	1504.8	3.3	4.95	2.97
7	Ban lasun	*Allium wallichii*	2301.7	2.7	2.36	1.42
8	Somlata	*Ephedra gerardiana*	3119.2	13.3	6.65	3.99
9	Titepati	*Artemisia gmelinii*	1205.9	10	3.75	2.25

SN	Local Name	Scientific Name	Potential Habitat Area (ha)	Wt/Plant (gm)	Wt/Ha (Kg)	Sustainable amount to harvest (Kg/Ha)
10	Rosa	*Rosa sericea*	1204.7	1	1.63	0.98

3.9.4.7 Chhusang CAMC (Lomanthang UCO)

Area: 48880 ha (19.2% of UCO, 2.9% of ACA)

Potential NTFPs: Yarshagumba, Sunpati, Padamchal, Kutki, Bhuin chuk and Jimbu

a) Ecological assessment

Forest area is absent in Chussang CAMC of ACA. Ecological dominancy of NTFPs is available in the understory and ground vegetation of this CAMC. Locally preferred NTFPs Bhuin chuk (PV= 2.23) and Sunpati (PV= 1.41) are more prominence in understory layer. In the ground vegetation higher prominence of the Titepati (PV=1.22), Padamchal (PV= 1.41), Kutki (PV= 3.60), Ban Lasun (PV= 1.73) and Jimbu (PV= 1.22) are recorded.

Table 67: Dominance and Prominence of Potential plant based NTFPs in Chhusang CAMC.

Shrub			
Species	**Scientific Name**	**Frequency**	**PV**
Bhuin chuk	*Hippophae tibetana*	0.2	2.23
Sunpati	*Rhododendron anthopogon*	0.1	1.41
Herb			
Titepati	*Artemisia gemelinii*	0.1	1.22
Padamchal	*Rheum australe*	0.1	1.41
Kutki	*Neopicrorhiza scrophulariifolia*	0.2	3.60
Ban Lasun	*Allium wallichii*	0.15	1.73
Jimbu	*Allium hypsistum*	0.1	1.22

b) Prioritized species and productivity

Yarshagumba, Kutki, Padamchal, Sunpati, Ban Lasun, Titepati, Bhuin chuk, Jimbu, Bhang and Niramasi are most prioritized plant based NTFPs by the local community of Chussang CAMC. In this CAMC the potential habitats of the commercial species like Yarshagumba, Padamchal, Sunpati and Kutki are higher than other species. In terms of production all prioritized species have harvestable quantity in this CAMC.

Table 68: Prioritized NTFPS with their habitat and production potential in Chhusang

SN	Local Name	Scientific Name	Potential Habitat Area (ha)	Wt/Plant (gm)	Wt/Ha (Kg)	Sustainable amount to harvest (Kg/Ha)
1	Yarshagumba	*Ophiocordyceps sinensis*	2444	0.5	0.015	0.013
2	Sunpati	*Rhododendron anthopogon*	3924.4	8.72	2.41	1.45
				1.87	0.52	0.31
3	Kutki	*Neopicrorhiza scrophulariifolia*	3870	0.8	2.90	1.74
4	Padamchal	*Rheum austral*	2480.6	26.9	6.73	4.04
5	Bhuin chuk	*Hippophae tibetana*	114.3	7.7	3.98	2.39
6	Jimbu	*Allium hypsistum*	800.2	3.6	2.70	1.62
7	Ban lasun	*Allium walichii*	5.1	2	2.50	1.50
8	Titepati	*Artemisia gmelinii*	1005	10	3.75	2.25
9	Bhang	*Cannabis sativa*	64.2	10	16.25	9.75
10	Nirmasi	*Delphinium denudatum*	117.4	15.4	1.93	1.16

3.9.5 Lwang UCO

Among the three UCOs representing the Kaski district of Nepal, Lwang covers 6.86% (52,384 hectares) of the ACA land area. It is the sole UCO representing the Myagdi District of Nepal. Lwang encompasses seven CAMCs: Lwanghalel, Machhapuchhre, Dhampus, Rivan, Lahchok, Gachok, and Sardikhola, which span the sub-tropical to nival climatic zones of Nepal.

Table 69: Prioritized NTFPs of Lwang UCO with Harvesting Protocols.

S. N	Local Name	Scientific Name	CAMCs	Frequency	Harvesting Protocol
1	Allo	*Girardinia diversifolia*	7	100	Collect bark from 2 years or more matured plants after releasing seeds in October-November. Three years rotation and reserve at least 25% production and area for regeneration are recommended.
2	Chutro	*Berberis asiatica*	7	100	Avoid mechanical harvesting; collect bark using sharp knife and peel of the bark along tree trunk. Strict to make wound size- 20cm wide* 80 cm long* 1 cm deep and > 30 cm spaces between wounds. Extract the bark from one third (33%) proportion of tree trunk.
3	Kurilo	*Asparagus racemosus*	7	100	Harvest leaves with small twigs using sharp sickle care mother plant to survive. Collect optimum 75% of the population.
4	Niguro	*Dryopteris cochleata*	7	100	Harvest leaves with small twigs using sharp sickle care mother plant to survive. Collect optimum 75% of the population.
5	Banko	*Arisaema tortuosum*	6	85.7	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.

S. N	Local Name	Scientific Name	CAMCs	Frequency	Harvesting Protocol
6	Timur	*Zanthoxylum armatum*	6	85.7	Avoid mechanical harvesting, Pick the fruits using hand or thrashed with a stick without damaging the branches. Avoid lopping/cutting of fruiting branches during fruit collection. Maximum allowable harvest quantity 90% of fruits. Harvest mature ripe fruits before dissemination.
7	Nigalo	*Thamnocalamus spathiflorus*	5	71.4	Rational harvesting maintaining at least 5 plots.
8	Satuwa	*Paris polyphylla*	5	71.4	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
9	Chiraito	*Swertia chirayita*	4	57.1	Collect mature plant materials (Seed are fully formed, mature, dried and disseminated. Collect optimum 85% of the population. Rotational harvesting ensuring sustainable production
10	Titepati	*Artemisia indica*	4	57.1	Collect mature plant materials (seeds are fully formed, matured, dried and disseminated). Collect optimum 85% of the population. Rational harvesting ensuring sustainable production
11	Tusa	*Drepanostachyum falcatum*	4	57.1	Rational harvesting maintaining at least 5 plots. Reserve about 25% of harvesting area and production for sustainable regeneration. Harvest shoots using sharp sickle care mother plant to survive. Harvest only matured and outer shoots of culm.
12	Halhale	*Rumex nepalensis*	3	42.9	Harvest leaves with small twigs using sharp sickle care mother plant to survive. Collect optimum 75% of the population.

S. N	Local Name	Scientific Name	CAMCs	Frequency	Harvesting Protocol
13	Lokta	*Daphne bholua*	3	42.9	Collect plant bark from the end of September or mid-October continuing into late Spring to mid-May (Kartik to Jestha) with two months break in the coldest months of mid-December to mid-February (Poush to Magh). Select only the plants of 10 cm or more circumference girth and 8-10 years or more aged stems for bark collection. Cut the matured stems at 15/30 cm above the ground for letting better coppicing and root system safe. Collect optimum 75% of the population.
14	Jatamasi	*Nardostachys jatamansi*	3	42.9	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
15	Kutki	*Neopicrorhiza scrophulariiflora*	3	42.9	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
16	Dhakayo	*Arisaema speciosum*	2	28.6	Harvest leaves with small twigs using sharp sickle care mother plant to survive. Collect optimum 75% of the population.

S. N	Local Name	Scientific Name	CAMCs	Frequency	Harvesting Protocol
17	Kafal	*Myrica esculenta*	2	28.6	Avoid mechanical harvesting, Pick the fruits using hand or thrashed with a stick without damaging the branches. Avoid lopping/cutting of fruiting branches during fruit collection. Maximum allowable harvest quantity 90% of fruits. Harvest mature ripe fruit
18	Bantarul	*Dioscorea pentaphylla*	1	14.3	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
19	Bhuletro	*Butea minor*	1	14.3	Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
20	Gittha	*Dioscorea sp.*	1	14.3	Harvest only desired portion of the plant. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
21	Guyeli	*Elaeagnus infundibularis*	1	14.3	Avoid mechanical harvesting, Pick the fruits using hand or thrashed with a stick without damaging the branches. Avoid lopping/cutting of fruiting branches during fruit collection. Maximum allowable harvest quantity 90% of fruits. Harvest mature ripe fruit

S. N	Local Name	Scientific Name	CAMCs	Frequency	Harvesting Protocol
22	Khiramlo	*Polygonatum verticillatum*	1	14.3	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
23	Lauthsalla	*Taxus wallichiana*	1	14.3	Avoid mechanical harvesting; collect bark using sharp knife and peel of the bark along tree trunk. Strict to make wound size- 20cm wide* 80 cm long* 1 cm deep and > 30 cm spaces between wounds. Extract the bark from one third (33%) o\proportion of tree trunk. Collect optimum 80% of leaves. Avoid lopping/cutting of trees and branches during leaf collection.
24	Pakhanbed	*Bergenia ciliata*	1	14.3	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
25	Pipla	*Piper longum*	1	14.3	Avoid mechanical harvesting, Pick the fruits using hand or thrashed with a stick without damaging the branches. Avoid lopping/cutting of fruiting branches during fruit collection. Maximum allowable harvest quantity 90% of fruits. Harvest mature ripe fruit

3.9.5.1 Dhampus CAMC

Area: 1180 ha (2.3% of UCO, 0.2% of ACA)
Potential NTFPs: Allo, Kurilo, Bantarul, Chutro, Ainselu, Banko, Niguro, Guyeli

a) Ecological assessment

In the forest area of Dhampus CAMC, locally preferred NTFPs are primarily found in the understory and ground vegetation layers. Ecologically, Ainselu (PV = 15.8) and Chutro (PV = 11.2) have high potential for harvest in the understory layer. Allo (PV = 11.0) also shows significant prominence in this layer. In the ground vegetation, higher prominence of Unyu (PV = 7.7), Niguro (PV = 5.8), and Pani Amala (PV = 5.8) are recorded.

Table 70: Dominance and prominence of potential plant based NTFPs in Dhampus CAMC

Tree					
Species	**Scientific Name**	**RDO**	**RF**	**RD**	**IVI**
Chilaune	*Schima wallichii*	20.0	20	30.3	70.3
Lali Gurans	*Rhododendron arboretum*	19.8	10	14.5	44.3
Katus	*Castanopsis indica*	6.3	8	3.6	17.9
Mauwa	*Engelhardia spicata*	3.3	10	3.6	16.9
Mallato	*Macaranga denticulate*	15.2	16	14.5	45.7
Rakchan	*Daphniphyllum himalense*	5.0	10	6.1	21.1
Shirish	*Albizia lebbeck*	3.4	4	3.0	10.4
Uttis	*Alnus nepalensis*	23.7	10	18.8	52.5
Kafal	*Myrica esculenta*	0.3	2	0.6	2.9
Guyeli	*Elaeagnus infundibularis*	0.7	4	1.2	5.9
Shrub					
Species	**Scientific Name**	**Frequency**		**PV**	
Ainselu	*Rubus ellipticus*	0.4		15.8	
Chutro	*Berberis asiatica*	0.2		11.2	
Allo	*Girardinia diversifolia*	0.5		11.0	
Angeri	*Lyonia ovalifolia*	0.1		5.5	
Sisnu	*Urtica dioica*	0.2		4.5	
Bantarul	*Dioscorea pentaphylla*	0.1		3.9	
Kurilo	*Asparagus racemosus*	0.1		1.8	
Herb					
Species	**Scientific Name**	**Frequency**		**PV**	
Unyu	*Dicranopteris linearis*	0.3		7.7	
Niguro	*Dryopteris cochleata*	0.3		5.8	
Pani Amala	*Nephrolepis cordifolia*	0.3		5.8	

Banko	*Arisaema tortuosum*	0.3	5.2

b) Potential species and productivity

The most prioritized plant-based NTFPs by the local community of Dhampus CAMC are Allo, Kurilo, Bantarul, Chutro, Ainselu, Banko, Niguro, and Guyeli. In terms of production, all prioritized species have harvestable quantities in this CAMC, with Allo showing the highest sustainable harvest amount.

Table 71: Prioritized NTFPs with their habitat and production potential in Dhampus CAMC

SN	Local name	Scientific name	Potential habitat area (ha)	Wt/plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
1	Kurilo	*Asparagus racemosus*	157.3	60	9.5	7.2
2	Bantarul	*Dioscorea pentaphylla*	78.7	800	42.4	34.0
3	Allo	*Girardinia diversifolia*	629.3	91	120.7	96.6
4	Chutro	*Berberis asiatica*	236.0	43	4.6	4.1
5	Ainselu	*Rubus ellipticus*	472.0	85	31.6	28.4
6	Banko	*Arisaema tortuosum*	314.7	35	93.3	74.6
7	Niguro	*Dryopteris cochleata*	393.3	19.2	64.0	48.0
8	Guyeli	*Elaeagnus infundibularis*	157.3	900	3.3	3.0

3.9.5.2 Ghachowk CAMC

Area: 1010 ha (1.9% of UCO, 0.1% of ACA)

Potential NTFPs: Chutro, Timur, Kurilo, Allo, Nigalo, Ainselu, Banko, Niguro, Satuwa, Dhakayo, Pakhanbed, Chiraito

a) Ecological assessment

In the forest area of Ghachok CAMC, locally preferred NTFPs are primarily found in the understory and ground vegetation layers. In the understory layer, Ainselu (PV = 17.0) and Timur (PV = 16.6) show high potential for harvest. Chutro (PV = 12.0) and Allo (PV = 6.8) also show significant prominence in this layer. In the ground vegetation layer, higher prominence of Unyu (PV = 8.3), Pani Amala (PV = 6.2), and Banko (PV = 5.5) are recorded. Niguro (PV = 3.9) and Dhakayo (PV = 3.9) also show notable presence.

Table 72: Dominance and prominence of potential plant based NTFPs in Ghachok CAMC

Tree					
Species	**Scientific name**	**RF**	**RD**	**RDO**	**IVI**
Rakchan	*Daphniphyllum himalense*	14.1	10.5	19.5	44.1
Mauwa	*Engelhardia spicata*	12.5	12.2	8.9	33.6
Malato	*Macaranga denticulate*	12.5	11.0	13.2	36.7
Phalat	*Quercus glauca*	3.1	1.1	1.5	5.7
Chilaune	*Schima wallichii*	14.1	21.5	15.8	51.4
Shirish	*Albizia lebbeck*	7.8	3.3	1.8	12.9
Uttis	*Alnus nepalensis*	12.5	14.9	19.0	46.5
Chaap	*Michelia champaca*	3.1	1.1	1.6	5.8
Katus	*Castanopsis indica*	14.1	18.8	15.1	47.9
Kafal	*Myrica esculenta*	1.6	0.6	0.2	2.3
Shrub					
Species	**Scientific name**	**Frequency**		**PV**	
Ainselu	*Rubus ellipticus*	0.5		17.0	
Timur	*Zanthoxylum armatum*	0.3		16.6	
Chutro	*Berberis asiatica*	0.2		12.0	
Allo	*Girardinia diversifolia*	0.5		6.8	
Nigalo	*Thamnocalamus spathiflorus*	0.2		5.9	
Sisnu	*Urtica dioica*	0.2		4.8	
Kurilo	*Asparagus racemosus*	0.4		3.1	
Herb					
Species	**Scientific name**	**Frequency**		**PV**	
Unyu	*Dicranopteris linearis*	0.3		8.3	
Pani Amala	*Nephrolepis cordifolia*	0.4		6.2	
Banko	*Arisaema tortuosum*	0.3		5.5	
Niguro	*Dryopteris cochleata*	0.2		3.9	
Dhakayo	*Arisaema speciosum*	0.2		3.9	
Pakhanbed	*Bergenia ciliata*	0.1		2.8	
Satuwa	*Paris polyphylla*	0.1		1.4	

b) Prioritized species and productivity

The most prioritized plant-based NTFPs by the local community of Ghachok CAMC are Chutro, Timur, Kurilo, Allo, Nigalo, Ainselu, Banko, Niguro, Satuwa, Dhakayo, Pakhanbed, and Chiraito. In terms of production, all prioritized species have harvestable quantities in this CAMC.

Table 73: Prioritized NTFPs with their habitat and production potential in Ghachok CAMC

SN	Species	Scientific name	Potential Habitat Area (ha)	Wt/Plant (gm)	Wt/ha (Kg)	Sustinable amount to harvest (kg/ha)
1	Chutro	*Berberis asiatica*	233.1	235.0	28.8	25.9
2	Timur	*Zanthoxylum armatum*	310.8	22.5	5.5	5.0
3	Kurilo	*Asparagus racemosus*	388.5	14.0	4.3	3.2
4	Allo	*Girardinia diversifolia*	466.2	102.5	87.8	70.3
5	Nigalo	*Thamnocalamus spathiflorus*	155.4	58.3	50.0	37.5
6	Ainselu	*Rubus ellipticus*	466.2	85.0	36.4	32.8
7	Banko	*Arisaema tortuosum*	310.8	33.0	101.5	81.2
8	Niguro	*Dryopteris cochleata*	155.4	14.0	32.3	24.2
9	Satuwa	*Paris polyphylla*	77.7	14.0	21.5	15.1
10	Dhakayo	*Arisaema speciosum*	155.4	55.2	84.9	67.9
11	Pakhanbed	*Bergenia ciliata*	77.7	56.2	43.2	34.6
12	Chiraito	*Swertia chirayita*	77.69	28.0	43.1	36.6

3.9.5.3 Lahachok CAMC

Area: 400 ha (0.8% of UCO, 0.1% of ACA)

Potential NTFPs: Chutro, Kurilo, Allo, Ainselu, Timur, Banko, Niguro, Titepati, Kafal

a) Ecological assessment

In the forest area of Lahachok CAMC, locally preferred NTFPs are primarily found in the understory and ground vegetation layers. In the understory layer, Chutro (PV = 16.4) and Ainselu (PV = 13.7) show high potential for harvest. Allo (PV = 6.3) and Timur (PV = 6.3) also show significant prominence in this layer. In the ground vegetation layer, higher prominence of Unyu (PV = 5.5), Titepati (PV = 4.5), and Pani Amala (PV = 3.2) are recorded. Niguro (PV = 2.2) also shows notable presence.

Table 74: Dominance and prominence of potential plant based NTFPs in Lahachok CAMC

Tree					
Species	**Scientific name**	**RF**	**RD**	**RDO**	**IVI**
Chilaune	*Schima wallichii*	20.0	44.1	26.9	91.0
Katus	*Castanopsis indica*	20.0	29.2	41.3	90.5
Mauwa	*Engelhardia spicata*	17.8	9.3	10.8	37.9
Malato	*Macaranga denticulate*	13.3	3.7	6.7	23.7

Uttis	*Alnus nepalensis*	11.1	4.3	4.7	20.2
Shirish	*Albizia lebbeck*	6.7	3.1	4.1	13.9
Rakchan	*Daphniphyllum himalense*	6.7	3.1	3.4	13.1
Shrub					
Species	**Scientific name**	**Frequency**		**PV**	
Chutro	*Berberis asiatica*	0.3		16.4	
Ainselu	*Rubus ellipticus*	0.3		13.7	
Allo	*Girardinia diversifolia*	0.4		6.3	
Timur	*Zanthoxylum armatum*	0.1		6.3	
Sisnu	*Urtica dioca*	0.2		4.5	
Kurilo	*Asparagus racemosus*	0.1		1.6	
Herb					
Species	**Scientific name**	**Frequency**		**PV**	
Unyu	*Dicranopteris linearis*	0.3		5.5	
Titepati	*Artemisia indica*	0.2		4.5	
Pani Amala	*Nephrolepis cordifolia*	0.1		3.2	
Niguro	*Dryopteris cochleata*	0.2		2.2	
Banko	*Arisaema tortuosum*	0.1		1.6	

b) Prioritized species and productivity

The most prioritized plant-based NTFPs by the local community of Lahachok CAMC are Chutro, Kurilo, Allo, Ainselu, Timur, Banko, Niguro, Titepati, and Kafal. In terms of production, all prioritized species have harvestable quantities in this CAMC.

Table 75: Prioritized NTFPs with their habitat and production potential in Lahachok CAMC

SN	Species	Scientific name	Potential Habitat area (ha)	Wt/Plant (gm)	Wt/ha (Kg)	Sustinable amount to harvest (kg/ha)
1	Chutro	*Berberis asiatica*	120	43	17.1	15.4
2	Kurilo	*Asparagus racemosus*	60	60	9.5	7.2
3	Allo	*Girardinia diversifolia*	160	175	208.2	166.6
4	Ainselu	*Rubus ellipticus*	120	85	47.3	42.6
5	Timur	*Zanthoxylum armatum*	50	350	27.9	25.1
6	Banko	*Arisaema tortuosum*	50	30	30.0	24.0
7	Niguro	*Dryopteris cochleata*	80	19.2	192.0	144.0
8	Titepati	*Artemisia indica*	80	35	105.0	84.0
9	Kafal	*Myrica esculenta*	110	1500	3.5	3.2

3.9.5.4 Lwang-Ghalel CAMC

Area: 16510 ha (31.5% of UCO, 2.2% of ACA)

Potential NTFPs Allo, Amriso, Ban tarul, Kurilo, Majitho, Tusa, Niguro, Titepati, Siltimur, Sisnu, Dhatelo, Timur, Satuwa, Lokta, Kaulo, Chiraito, Kafal, Lauthsalla

a) Ecological assessment

In the forest area of Lwang-Ghalel CAMC, locally preferred NTFPs are found in the understory and ground vegetation layers. In the understory layer, Lokta (PV = 25.3) and Allo (PV = 14.8) show high potential for harvest. Nigalo (PV = 8.9), Timur (PV = 7.9), and Tusa (PV = 5.0) also show significant prominence. In the ground vegetation layer, higher prominence of Satuwa (PV = 8.2), Titepati (PV = 6.3), and Niguro (PV = 5.8) are recorded. Chiraito (PV = 3.2) and Dhakayo (PV = 2.2) also show notable presence.

Table 76: Dominance and prominence of potential plant based NTFPs in Lwang-Ghalel CAMC

Tree					
Species	**Scientific name**	**RF**	**RD**	**RDO**	**IVI**
Katus	*Castanopsis indica*	15.7	12.9	18.2	46.8
Lali Gurans	*Rhododendron arboretum*	13.3	13.8	12.9	40.0
Rakchan	*Daphniphyllum himalense*	6.0	18.0	12.0	36.0
Chilaune	*Schima wallichii*	14.5	11.1	9.5	35.1
Uttis	*Alnus nepalensis*	10.8	8.8	12.4	32.0
Phalat	*Quercus glauca*	7.2	4.6	6.9	18.8
Lauthsalla	*Taxus wallichiana*	4.8	1.8	6.6	13.3
Malato	*Macaranga denticulata*	6.0	1.4	3.1	10.5
Kafal	*Myrica esculenta*	1.2	0.5	0.9	2.5
Guyeli	*Elaeagnus infundibularis*	1.2	0.9	0.3	2.4
Shrub					
Species	**Scientific name**	**Frequency**		**PV**	
Lokta	*Daphne bholua*	0.4		25.3	
Allo	*Girardinia diversifolia*	0.4		14.8	
Nigalo	*Thamnocalamus spathiflorus*	0.2		8.9	
Timur	*Zanthoxylum armatum*	0.1		7.9	
Ainselu	*Rubus ellipticus*	0.2		5.8	
Tusa	*Drepanostachyum falcatum*	0.3		5.0	
Sisnu	*Urtica dioica*	0.1		4.7	
Kurilo	*Asparagus racemosus*	0.2		3.9	
Herb					
Species	**Scientific name**	**Frequency**		**PV**	
Chutro	*Berberis asiatica*	0.1		3.2	
Satuwa	*Paris polyphylla*	0.3		8.2	
Titepati	*Artemisia indica*	0.1		6.3	
Niguro	*Dryopteris cochleate*	0.2		5.8	

Banko	*Arisaema tortuosum*	0.2	3.9
Chiraito	*Swertia chirayita*	0.1	3.2
Dhakayo	*Arisaema speciosum*	0.1	2.2
Unyau	*Dicranopteris linearis*	0.2	1.9
Khiramlo	*Polygonatum verticillatum*	0.1	1.1
Halhale	*Rumex nepalensis*	0.1	1.1

b) Prioritized species and productivity

Lokta, Allo, Timur, Tusa, Nigalo, Chutro, Ainselu, Kurilo, Banko, Dhakayo, Niguro, Satuwa, Chiraito, Khiramlo, Halhale, Kafal, and Lauthsalla are the most prioritized plant-based NTFPs by the local community of Lwangghalel CAMC. In terms of production, all of these prioritized NTFPs have harvestable quantities in this CAMC, which is notable given the diversity of species prioritized.

Table 77: Prioritized NTFPs with their habitat and production potential in Lwang-Ghalel CAMC

SN	Species	Scientific name	Potential Habitat Area (Ha)	Wt/Plant (gm)	Wt/ha (Kg)	Sustinable amount to harvest (kg/ha)
1	Lokta	*Daphne bholua*	6604	65	77.6	54.3
2	Allo	*Girardinia diversifolia*	5778.5	85	10.1	8.1
3	Timur	*Zanthoxylum armatum*	1651	320	25.5	22.9
4	Tusa	*Drepanostachyum falcatum*	4127.5	60	35.8	26.9
5	Nigalo	*Thamnocalamus spathiflorus*	3302	60	286.5	214.9
6	Chutro	*Berberis asiatica*	1651	205	8.2	7.3
7	Ainselu	*Rubus ellipticus*	2476.5	125	34.8	31.3
8	Kurilo	*Asparagus racemosus*	2476.5	17	4.7	3.6
9	Banko	*Arisaema tortuosum*	2476.5	32	80.0	64.0
10	Dhakayo	*Arisaema speciosum*	825.5	50	100.0	80.0
11	Niguro	*Dryopteris cochleate*	2476.5	15	52.5	39.4
12	Satuwa	*Paris polyphylla*	4953	12	53.3	40
13	Chiraito	*Swertia chirayita*	1651	17	85.0	72.3
14	Khiramlo	*Polygonatum verticillatum*	825.5	25	62.5	50.0
15	Halhale	*Rumex nepalensis*	825.5	20	20.0	16.0
16	Kutki	*Picrorhiza kurroa*	2025.7	17.0	6.5	5.3
17	Jatamasi	*Nardostachys grandiflora*	1593.5	18.0	5.7	4.3
18	Kafal	*Myrica esculenta*	825.5	1200	41.4	37.3
19	Lauthsalla	*Taxus wallichiana*	3302	6500	1.9	0.6

3.9.5.5 Machhapuchhre CAMC

Area: 26840 ha (51.2% of UCO, 3.5% of ACA)

Potential NTFPs: Nigalo, Allo, Ainselu, Timur, Sisnu, Tusa, Chutro, Kurilo, Titepati, Niguro, Satuwa, Chiraito

a) Ecological assessment

In the forest area of Machhapuchhre CAMC, locally preferred NTFPs are primarily found in the understory and ground vegetation layers. In the understory layer, Nigalo (PV = 19.3) and Allo (PV = 15.6) show high potential for harvest. Ainselu (PV = 10.4) and Timur (PV = 8.8) also show significant prominence in this layer. In the ground vegetation layer, higher prominence of Unyau (PV = 9.3), Niguro (PV = 8.3), and Titepati (PV = 7.2) are recorded. Chiraito (PV = 4.4) and Satuwa (PV = 2.6) also show notable presence.

Table 78: Dominance and prominence of potential plant based NTFPs in Machhapuchhre CAMC

Tree					
Species	**Scientific name**	**RF**	**RD**	**RDO**	**IVI**
Chilaune	*Schima wallichii*	3.1	15.2	17.0	44.6
Uttis	*Alnus nepalensis*	12.4	13.3	18.8	43.5
Rakchan	*Daphniphyllum himalense*	9.3	16.7	9.6	30.4
Katus	*Castanopsis indica*	10.3	6.2	6.5	26.1
Lali Gurans	*Rhododendron arboretum*	13.4	8.1	6.9	25.3
Malato	*Macaranga denticulate*	9.3	8.1	6.9	24.3
Mauwa	*Engelhardia spicata*	5.2	8.6	7.9	21.6
Dubdube	*Garuga pinnata*	4.1	4.3	6.1	19.6
Phalat	*Quercus glauca*	6.2	5.7	7.6	19.5
Shirish	*Albizia lebbeck*	4.1	4.3	5.7	13.1
Okhar	*Juglans regia*	3.1	3.8	4.0	11.9
Chaap	*Magnolia champaca*	11.3	2.4	1.1	6.6
Shrub					
Species	**Scientific name**	**Frequency**		**PV**	
Nigalo	*Thamnocalamus spathiflorus*	0.3		19.3	
Allo	*Girardinia diversifolia*	0.4		15.6	
Ainselu	*Rubus ellipticus*	0.2		10.4	
Timur	*Zanthoxylum armatum*	0.1		8.8	
Sisnu	*Urtica dioica*	0.2		7.0	
Tusa	*Drepanostachyum falcatum*	0.3		5.5	
Chutro	*Berberis asiatica*	0.0		4.2	
Kurilo	*Asparagus racemosus*	0.2		4.2	
Herb					
Species	**Scientific name**	**Frequency**		**PV**	
Unyau	*Dicranopteris linearis*	0.2		9.3	
Niguro	*Dryopteris cochleata*	0.2		8.3	
Titepati	*Artemisia indica*	0.1		7.2	

Chiraito	*Swertia chirayita*	0.1	4.4
Halhale	*Rumex nepalensis*	0.1	3.6
Satuwa	*Paris polyphylla*	0.3	2.6
Banko	*Arisaema tortuosum*	0.1	1.5

b) Prioritized species and productivity

The most prioritized plant-based NTFPs by the local community of Machhapuchhre CAMC are Ainselu, Chutro, Timur, Allo, Nigalo, Tusa, Kurilo, Niguro, Titepati, Chiraito, Satuwa, Kutki, and Jatamasi. In terms of production, all prioritized species have harvestable quantities in this CAMC.

Table 79: Prioritized NTFPs with their habitat and production potential in Machhapuchhre CAMC

SN	Species	Scientific name	Potential Habitat Area (Ha)	Wt/Plant (gm)	Wt/ha (Kg)	Sustinable amount to harvest (kg/ha)
1	Ainselu	*Rubus ellipticus*	4667.8	43.0	10.4	9.4
2	Chutro	*Berberis asiatica*	1167.0	60.0	6.2	5.6
3	Timur	*Zanthoxylum armatum*	2333.9	55.0	5.7	5.1
4	Allo	*Girardinia diversifolia*	10502.6	20.0	18.7	16.8
5	Nigalo	*Thamnocalamus spathiflorus*	8168.7	85.0	676.4	507.3
6	Tusa	*Drepanostachyum falcatum*	8168.7	350.0	278.5	208.9
7	Kurilo	*Asparagus racemosus*	4667.8	19.2	9.3	7.0
8	Niguro	*Dryopteris cochleata*	4667.8	34.0	443.5	332.6
9	Titepati	*Artemisia indica*	3500.9	35.0	487.0	389.6
10	Chiraito	*Swertia chirayita*	2333.9	36.0	187.8	159.7
11	Halhale	*Rumex nepalensis*	3500.9	38.0	132.2	105.7
12	Satuwa	*Paris polyphylla*	7001.7	15.0	46.67	35
13	Kutki	*Neopicrorhiza scrophulariiflora*	1591.2	17.0	6.2	5.0
14	Jatamasi	*Nardostachys jatamansi*	1755.7	18.0	5.3	4.0

3.9.5.6 Rivan CAMC

Area: 1350 ha (2.6% of UCO, 0.2% of ACA)

Potential NTFPs: Allo, Timur, Lokta, Pipla, Nigalo, Ainselu, Kurilo, Tusa, Chutro, Banko, Titepati, Niguro, Chiraito, Satuwa

a) Ecological assessment

In the forest area of Rivan CAMC, locally preferred NTFPs are primarily found in the understory and ground vegetation layers. In the understory layer, Allo (PV = 17.7) and Timur (PV = 13.7) show high potential for harvest. Lokta (PV = 9.5) and Pipla (PV = 8.2) also show significant prominence in this layer. In the ground vegetation layer, higher prominence of Titepati (PV = 9.5), Niguro (PV = 5.5), and Banko (PV = 4.5) are recorded. Satuwa (PV = 4.5) and Chiraito (PV = 3.2) also show notable presence.

Table 80: Dominance and prominence of potential plant based NTFPs in Rivan CAMC

Tree					
Species	**Scientific name**	**RF**	**RD**	**RDO**	**IVI**
Rakchan	*Daphniphyllum himalense*	16.7	26.9	18.6	62.1
Mauwa	*Engelhardia spicata*	11.9	6.5	9.3	27.6
Malato	*Macaranga denticulate*	9.5	12.0	21.7	43.3
Phalat	*Quercus glauca*	9.5	8.3	7.9	25.7
Chilaune	*Schima wallichii*	19.0	13.0	8.7	40.8
Shirish	*Albizia lebbeck*	7.1	5.6	4.8	17.5
Uttis	*Alnus nepalensis*	11.9	11.1	13.0	36.0
Okhar	*Juglans regia*	2.4	5.6	7.3	15.3
Katus	*Castanopsis indica*	4.8	8.3	6.1	19.2
Guyeli	*Elaeagnus infundibularis*	2.4	0.9	0.4	3.7
Shrub					
Species	**Scientific name**	**Frequency**		**PV**	
Allo	*Girardinia diversifolia*	0.5		17.7	
Timur	*Zanthoxylum armatum*	0.3		13.7	
Lokta	*Daphne bholua*	0.4		9.5	
Pipla	*Piper longum*	0.1		8.2	
Nigalo	*Thamnocalamus spathiflorus*	0.3		8.2	
Ainselu	*Rubus ellipticus*	0.3		5.5	
Kurilo	*Asparagus racemosus*	0.1		4.7	
Tusa	*Drepanostachyum falcatum*	0.3		2.7	
Chutro	*Berberis asiatica*	0.2		2.2	
Herbs					
Species	**Scientific name**	**Frequency**		**PV**	
Titepati	*Artemisia indica*	0.4		9.5	
Niguro	*Dryopteris cochleata*	0.3		5.5	

Banko	*Arisaema tortuosum*	0.2	4.5
Satuwa	*Paris polyphylla*	0.2	4.5
Chiraito	*Swertia chirayita*	0.1	3.2

b) Prioritized species and productivity

The most prioritized plant-based NTFPs by the local community of Rivan CAMC are Timur, Nigalo, Tusa, Chutro, Ainselu, Lokta, Kurilo, Allo, Pipla, Banko, Titepati, Niguro, Chiraito, and Satuwa. In terms of production, all prioritized species have harvestable quantities in this CAMC.

Table 81: Prioritized NTFPs with their habitat and production potential in Rivan CAMC

SN	Species	Scientific name	Potential Habitat area (ha)	Wt/plant (gm)	Wt/ha (Kg)	Sustinable amount to harvest (kg/ha)
1	Timur	*Zanthoxylum armatum*	405	150	23.9	21.5
2	Nigalo	*Thamnocalamus spathiflorus*	405	200	159.6	119.7
3	Tusa	*Drepanostachyum falcatum*	405	150	83.6	62.7
4	Chutro	*Berberis asiatica*	270	230	54.9	49.4
5	Ainselu	*Rubus ellipticus*	405	95.2	75.8	68.2
6	Lokta	*Daphne bholua*	540	60.2	76.6	53.7
7	Kurilo	*Asparagus racemosus*	135	17	4.1	3.0
8	Allo	*Girardinia diversifolia*	675	22	26.3	21.0
9	Pipla	*Piper longum*	270	35	2.8	2.5
10	Banko	*Arisaema tortuosum*	270	30	150.0	120.0
11	Titepati	*Artemisia indica*	540	42	630.0	504.0
12	Niguro	*Dryopteris cochleata*	405	15	180.0	135.0
13	Chiraito	*Swertia chirayita*	135	25	125.0	106.3
14	Satuwa	*Paris polyphylla*	270	15	100	75

3.9.5.7 Sardikhola CAMC

Area: 5090 ha (9.7% of UCO, 0.7% of ACA)

Potential NTFPs: Chutro, Bhuletro, Nigalo, Tusa, Timur, Allo, Ainselu, Kurilo, Lokta, Banko, Titepati, Niguro, Gittha, Satuwa, Halhale

a) Ecological assessment

In the forest area of Sardhikhola CAMC, locally preferred NTFPs are found in the understory and ground vegetation layers. In the understory layer, Nigalo (PV = 20.4) and Tusa (PV = 20.8) show high potential for harvest. Chutro (PV = 9.8), Timur (PV = 13.7), and Allo (PV = 6.2) also show significant prominence. In the ground vegetation layer, higher prominence of Niguro (PV = 12.4), Satuwa (PV = 9.6), and Titepati (PV = 7.8) are recorded. Gittha (PV = 5.9) and Banko (PV = 2.0) also show notable presence.

Table 82: Dominance and prominence of potential plant based NTFPs in Sardikhola CAMC

Tree					
Species	**Scientific name**	**RDO**	**RF**	**RD**	**IVI**
Katus	*Castanopsis indica*	4.8	10.4	9.4	24.6
Chaap	*Magnolia sps.*	1.9	8.3	1.6	11.8
Chilaune	*Schima wallichii*	20.2	14.6	13.3	48.0
Lali Gurans	*Rhododendron arboreum*	3.6	4.2	3.9	11.7
Malato	*Macaranga denticulata*	15.0	8.3	13.3	36.6
Mauwa	*Engelhardia spicata*	6.2	10.4	10.9	27.6
Payiu	*Prunus cerasoides*	1.4	2.1	1.6	5.1
Phalat	*Quercus glauca*	1.5	4.2	1.6	7.3
Rakchan	*Daphniphyllum himalense*	21.1	12.5	18.8	52.4
Shirish	*Albizia lebbeck*	11.2	12.5	7.8	31.5
Uttis	*Alnus nepalensis*	9.7	8.3	15.6	33.6
Guyeli	*Elaeagnus infundibularis*	3.4	4.2	2.3	9.9
Shrub					
Species	**Scientific name**	**Frequency**		**PV**	
Chutro	*Berberis asiatica*	0.2		9.8	
Bhuletro	*Butea minor*	0.2		7.8	
Nigalo	*Thamnocalamus spathiflorus*	0.5		20.4	
Tusa	*Drepanostachyum falcatum*	0.7		20.8	
Timur	*Zanthoxylum armatum*	0.2		13.7	
Allo	*Girardinia diversifolia*	0.4		6.2	
Ainselu	*Rubus ellipticus*	0.2		5.9	
Kurilo	*Asparagus racemosus*	0.2		4.8	
Lokta	*Daphne bholua*	0.4		3.1	
Herb					
Species	**Scientific name**	**Frequency**		**PV**	
Banko	*Arisaema tortuosum*	0.2		2.0	
Titepati	*Artemisia indica*	0.2		7.8	
Niguro	*Dryopteris cochleata*	0.4		12.4	
Gittha	*Dioscorea sp.*	0.2		5.9	
Satuwa	*Paris polyphylla*	0.2		9.6	

Halhale	*Rumex nepalensis*	0.2	2.0

b) Prioritized species and productivity

The most prioritized plant-based NTFPs by the local community of Sardhikhola CAMC are Chutro, Bhuletro, Nigalo, Tusa, Timur, Allo, Ainselu, Kurilo, Lokta, Banko, Titepati, Niguro, Gittha, Satuwa, and Halhale. In terms of production, all of these prioritized NTFPs have harvestable quantities in this CAMC.

Table 83: Prioritized NTFPs with their habitat and production potential in Sardikhola CAMC

SN	Local name	Scientific name	Potential Habitat Area (Ha)	Wt/Plant (gm)	Wt/ha (Kg)	Sustinable amount to harvest (kg/ha)
1	Chutro	*Berberis asiatica*	783.1	195.0	59.7	53.7
2	Bhuletro	*Butea minor*	783.1	56.0	13.7	11.0
3	Nigalo	*Thamnocalamus spathiflorus*	2349.2	35.0	749.9	562.4
4	Tusa	*Drepanostachyum falcatum*	3523.8	30.0	91.8	68.9
5	Timur	*Zanthoxylum armatum*	783.1	51.0	9.4	8.4
6	Allo	*Girardinia diversifolia*	1957.7	85.0	176.9	141.5
7	Ainselu	*Rubus ellipticus*	783.1	95.0	34.9	31.4
8	Kurilo	*Asparagus racemosus*	1174.6	17.0	8.3	6.2
9	Lokta	*Daphne bholua*	1957.7	55.0	74.1	51.8
10	Banko	*Arisaema tortuosum*	783.1	32.0	123.1	98.5
11	Titepati	*Artemisia indica*	783.1	36.0	193.8	155.1
12	Niguro	*Dryopteris cochleate*	1957.7	15.0	184.6	138.5
13	Gittha	*Dioscorea sp.*	783.1	15.0	23.1	18.5
14	Satuwa	*Paris polyphylla*	1174.6	14.0	24	18
15	Halhale	*Rumex nepalensis*	783.1	18.0	69.2	55.4
16	Kutki	*Picrorhiza kurroa*	391	17.0	6.2	7.0

SN	Local name	Scientific name	Potential Habitat Area (Ha)	Wt/Plant (gm)	Wt/ha (Kg)	Sustinable amount to harvest (kg/ha)
17	Jatamasi	*Nardostachys grandiflora*	405	19.0	6.2	5.3

3.9.6 Manang UCO

The Manang district in Nepal, covering 25% (195,000 hectares) of the ACA, is managed by the Manang UCO. This UCO incorporates 13 CAMCs from diverse climatic zones, ranging from higher sub-tropical to nival zones. The CAMCs included are Manang, Khangsar, Tanki Manang, Bhraka, Phoo, Dharapani, Tachain Bagarchap, Ngawal, Pisang, Ghyaru, Chame, Thonche, and Nar. The UCO spans both the central and trans-Himalayan physiographic regions of Nepal. A recent study identified 45 non-timber forest products (NTFPs) within this UCO, with 33 of these being prioritized by the local population. Among the most favored NTFPs by the CAMCs of Manang UCO are Ban Lasun and Yarshagumba.

Table 84: Prioritized NTFPs of Manang UCO with harvesting protocol

S.N.	Local Name	Scientific Name	CAMCs	Frequency	Harvesting Protocols
1	Kakoli (Ban Lasun)	*Fritillaria cirrhosa*	13	100	Harvest only the desired portion of the plant. Dug out tubers of matured and older plants only. Replant/left the apical portion of tubers, immature sister bulbs, the seedling part, or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance population.
2	Yarshagumba	*Ophiocordyceps sinensis*	12	92.3	Harvest from May to July. Pick manually by using pointed mechanical tool (like chuche kuto) which disperse minimal soil while digging. Collect only the mature stalk. Reserve about 10% of the production area for sustainable regeneration.
3	Nirmasi	*Delphinium denudatum*	11	84.6	Harvest only the desired portion of the plant. Dug out tubers of matured and older plants only. Replant/left the apical portion of tubers, immature sister bulbs, the seedling part, or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance population.
4	Kutki	*Neopicrorhiza scrophulariifolia*	10	76.9	Harvest only the desired portion of the plant. Dug out tubers of matured and older plants only.

S.N.	Local Name	Scientific Name	CAMCs	Frequency	Harvesting Protocols
					Replant/left the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance population.
5	Sunpati	*Rhododendron anthopogon*	10	76.9	Leaves Avoid mechanical harvesting; harvest leaves using sharp sickle, care mother plant to survive. Collect optimum 80% of leaves. Avoid lopping/cutting of trees and branches during leaf collection. Flower Avoid mechanical harvesting. A maximum of 90 % of flowers are allowed to be harvested.
6	Dhupi	*Juniperus indica*	10	76.9	Avoid mechanical harvesting; harvest leaves using sharp sickle, care mother plant to survive. Collect optimum 80% of leaves. Avoid lopping/cutting of trees and branches during leaf collection.
7	Jatamasi	*Nardostachys grandiflora*	9	69.2	Harvest only the desired portion of the plants. Dug out tubers of matured and older plants only. Replant/left the apical portion of tubers, immature sister bulbs, the seedling part, or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance population.
8	Pongar	*Aconitum gammiei*	7	53.8	Harvest only the desired portion of the plants. Dug out tubers of matured and older plants only. Replant/left the apical portion of tubers, immature sister bulbs, the seedling part, or immature plants to ensure regeneration. Collect optimum 70% of the population.

S.N.	Local Name	Scientific Name	CAMCs	Frequency	Harvesting Protocols
					Operate harvesting activities within areas having abundance population.
9	Lauth Salla	*Taxus wallichiana*	6	46.2	Avoid mechanical harvesting; harvest bark using sharp knife and peel of bark along tree trunk and collect leaf using sharp sickle. Strict to make wound size - 20 cm wide × 80 cm long × 1 cm deep and > 30 cm spaces between wounds. Extract the leaf Bark from one third (33%) proportion of the trunk.
10	Guchhichyau	*Morchella esculenta*	5	38.5	Collect mature plant materials. Harvest 85% of plant population. Follow rotational harvesting practices.
11	Setakchini	*Polygonatum verticillatum*	5	38.5	Harvest only the desired portion of the plant. Dug out tubers of matured and older plants only. Replant/left the apical portion of tubers, immature sister bulbs, the seedling part, or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance population.
12	Kurilo	*Asparagus officinalis*	5	38.5	Collect mature plant materials. Harvest 85% of plant population. Follow rotational harvesting practices.
13	Bhuichuk/Bhuinchuk	*Hippophae tibetana*	4	30.8	Avoid Mechanical Harvesting; picked the fruits using hand or thrashed with a stick without damaging the branches. Avoid lopping/cutting of fruit branching during fruit collection. Maximum allowable harvest quantity 90% of fruits. Harvest mature ripe fruits before seed dissemination.
14	Dalechuk	*Hippophae salicifolia*	4	30.8	Avoid Mechanical Harvesting; picked the fruits using hand or thrashed with a stick without damaging the branches. Avoid lopping/cutting of fruit branching during fruit collection. Maximum allowable harvest quantity 90% of fruits.

S.N.	Local Name	Scientific Name	CAMCs	Frequency	Harvesting Protocols
					Harvest mature ripe fruits before seed dissemination
15	Satuwa	*Paris polyphylla*	4	30.8	Harvest only the desired portion of the plants. Dug out tubers of matured and older plants only. Replant/left the apical portion of tubers, immature sister bulbs, the seedling part, or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance population.
16	Padamchal	*Rheum australe*	4	30.8	Harvest leaves with petiole (Chulthi) using sharp sickle, care mother plant to survive. Collection optimum 75% of the population.
17	Lokta	*Daphne bholua*	4	30.8	Avoid mechanical harvesting; harvest bark using sharp knife and peel of bark along tree trunk. Extract the Bark from mature plants trunk.
18	Ban Lasun	*Fritillaria cirrhosa*	3	23.1	Harvest leaves using sharp sickle, care mother plant to survive. Collect optimum 75% of the population.
19	Timur	*Zanthoxylum armatum*	3	23.1	Picked the fruits using hand without damaging the branches. Avoid lopping/cutting of fruit branching during fruit collection. Maximum allowable harvest quantity 90% of fruits. Harvest mature ripe fruits before seed dissemination (October-November).
20	Maharangi	*Maharanga emodi*	3	23.1	Collect mature plant materials (seed are fully formed, matured, dried and disseminated). Collect optimum 85% of population. Rotational harvesting ensuring sustainable production.
21	Bish	*Aconitum spicatum*	3	23.1	Harvest only the desired portion of the plants. Dug out tubers of matured and older plants only. Replant/left the apical portion of tubers, immature sister bulbs, the seedling part, or immature plants to ensure regeneration.

S.N.	Local Name	Scientific Name	CAMCs	Frequency	Harvesting Protocols
					Collect optimum 70% of the population. Operate harvesting activities within areas having abundance population.
22	Dhatelo	*Prinsepia utilis*	3	23.1	Picked the fruits using hand without damaging the branches. Avoid lopping/cutting of fruit branching during fruit collection. Maximum allowable harvest quantity 90% of fruits. Harvest mature ripe fruits before seed dissemination
23	Rato chyau	*Ganoderma lucidum*	3	23.1	Collect mature plant materials. Collect optimum 85% of population. Rotational harvesting ensuring sustainable production.
24	Nigalo	*Thamnocalamus spathiflorus*	2	15.4	
25	Sadharan Chyau	*Ganoderma sp.*	2	15.4	Collect mature plant materials. Collect optimum 85% of population. Rotational harvesting ensuring sustainable production.
26	Chiraito	*Swertia chirayita*	1	7.69	Collect mature plant materials (seed are fully formed, matured, dried and disseminated). Collect optimum 85% of population. Rotational harvesting ensuring sustainable production.
27	Bhojpatra	*Betula utilis*	1	7.69	Avoid mechanical harvesting; harvest bark using sharp knife and peel of bark along tree trunk. Strict to make wound size - 20 cm wide × 80 cm long × 1 cm deep and > 30 cm spaces between wounds. Extract the Bark from one third (33%) proportion of the trunk.
28	Jimbu	*Allium hypsistum*	1	7.69	Harvest leaves using sharp sickle, care mother plant to survive. Collect optimum 75% of the population.
29	Siltimur	*Litsea cubeba*	1	7.69	Avoid Mechanical Harvesting; picked the fruits using hand or thrashed with a stick without damaging the branches.

S.N.	Local Name	Scientific Name	CAMCs	Frequency	Harvesting Protocols
					Avoid lopping/cutting of fruit branching during fruit collection. Maximum allowable harvest quantity 90% of fruits. Harvest mature ripe fruits before seed dissemination.
30	Sugandhawal	*Valeriana jatamansi*	1	7.69	Harvest only the desired portion of the plants. Dug out tubers of matured and older plants only. Replant/left the apical portion of tubers, immature sister bulbs, the seedling part, or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance population.
31	*Pakhanbed*	*Bergenia ciliata*	1	7.69	Harvest only the desired portion of the plants. Dug out tubers of matured and older plants only. Replant/left the apical portion of tubers, immature sister bulbs, the seedling part, or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance population.
32	Raltung	*Chenopodium album*	1	7.69	Harvest leaves using sharp sickle, care mother plant to survive. Collect optimum 75% of the population.
33	Niguro	*Matteuccia struthiopteris*	1	7.69	Collect mature plant materials. Harvest 85% of plant population. Follow rotational harvesting practices.

3.9.6.1 Bhraka CAMC (Manang UCO)

Area: 7000 ha (3.6% of UCO, 0.9% of ACA)

Potential NTFPs: Yarshagumba, Sunpati, Dalechuk, Pongor, Kutki, Bhojpatra and Ban Lasun

a) Ecological assessment

Due to its location in Trans Himalayan region, forest canopy is absent in Bhraka CAMC of Manang UCO. Ecological dominancy of NTFP are available in the understory and ground vegetation of this CAMC. Locally preferred NTFPs Sunpati (PV= 0.8) and Bhin chuk (PV= 0.2) are more prominence in shrub layer. In the ground vegetation higher prominence of Padamchal (PV= 5.4), Kutki (PV= 4.5) and Ban Lasun (PV= 1.1) are recorded.

Table 85: Dominance and Prominence of Potential plant based NTFPs in Bhraka CAMC.

Shrub			
Species	**Scientific Name**	**Frequency**	**PV**
Rose	*Rosa sericea*	0.1	1.2
Sunpati	*Rhododendron anthopogon*	0.3	0.8
Bhuichuk/Bhuin chuk	*Hippophae tibetana*	0.1	0.2
Herb			
Padamchal	*Rheum australe*	0.1	5.4
Kutki	*Neopicrorhiza scrophulariifolia*	0.6	4.5
Kakoli (Ban Lasun)	*Fritillaria cirrhosa*	0.1	1.1

b) Prioritized species and productivity

Yarshagumba, Sunpati, Kutki, Padamchal, Bhuin chuk, Pongar, Bhojpatra, Ban Lasun and Dhupi are most prioritized plant based NTFPs by the local communities of Bhraka CAMC. In this CAMC, the potential habitats of commercial species like Yarshagumba, Kutki, Sunpati, and Dhupi are higher than other species. In terms of production all prioritized species, except Lichens have harvestable quantity in this CAMC.

Table 86: Prioritized NTFPS with their habitat and production potential in Bhraka CAMC

S.N.	**Local Name**	**Scientific Name**	**Potential Habitat Area (ha)**	**Wt/Plant (gm)**	**Wt/Ha (Kg)**	**Sustainable amount to harvest (Kg/Ha)**
1	Yarshagumba	*Ophiocordyceps sinensis*	2215.0	3.3	0.022	0.019
2	Sunpati	*Rhododendron anthopogon*	264.8	44 (Lf)	2.72	2.176
				0.81 (Fl)	0.13	0.1

S.N.	Local Name	Scientific Name	Potential Habitat Area (ha)	Wt/Plant (gm)	Wt/Ha (Kg)	Sustainable amount to harvest (Kg/Ha)
3	Kutki	*Neopicrorhiza scrophulariifolia*	2051.3	8.0	8.4	6.72
4	Padamchal	*Rheum australe*	2322.6	12.0	24.1	19.28
5	Bhuichuk/Bhuinchuk	*Hippophae tibetana*	31.9	7.0	10.1	8.08
6	Pongar	*Aconitum gammiei*	254.3	10.1	2.1	1.68
7	Bhojpatra	*Betula utilis*	405.2	4235.2	36.0	11.9
8	Kakoli (Ban Lasun)	*Fritillaria cirrhosa*	1920.6	10.5	6.7	4.8
9	Dhupi	*Juniperus indica*	173.8	3095.0	70.0	49.0
10	Nirmasi	*Delphinium denudatum*	2051.3	12.3	1.4	1.1

3.9.6.2 Chame CAMC (Manang UCO)

Area: 9790 ha (5.0% of UCO, 1.3% of ACA)

Potential NTFPs: Yarshagumba, Guchhichyau, Timur, Satuwa, Nirmasi, Kutki, Rato chyau, Dalechuk and Jatamasi

a) Ecological assessment

In the forest area of Chame CAMC, locally preferred NTFPs are unavailable at canopy layer. Ecologically Lauth salla (IVI = 108.9) and Bhojpatra (IVI = 90.8) have potential to harvest in Chame CAMC but local people did not consider it as preferred species. Ecologically dominancy of other NTFPs are available in the understory and ground vegetation of this CAMC. Locally preferred NTFPs Nigalo (PV = 1.8), Timur (PV = 0.5) and Lokta (PV = 0.1) are more prominence in understory layer. In the ground vegetation higher prominence of Satuwa (PV = 5.6), Kakoli/Ban Lasun (PV = 1.1), Kutki (PV = 1.0) and Ratochyau (PV = 0.5) are recorded.

Table 87: Dominance and Prominence of Potential plant based NTFPs in Chame CAMC.

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Lauth Salla	*Taxus wallichiana*	35.0	45.2	28.7	108.9
Bhojpatra	*Betula utilis*	30.0	22.0	38.8	90.8
Shrub					
Species	**Scientific Name**	**Frequency**			**PV**
Nigalo	*Thamnocalamus spathiflorus*	0.2			1.8
Timur	*Zanthoxylum armatum*	0.2			0.5
Lokta	*Daphne bholua*	0.1			0.1

Herb			
Species	**Scientific Name**	**Frequency**	**PV**
Satuwa	*Paris polyphylla*	0.1	5.6
Kakoli (Ban Lasun)	*Fritillaria cirrhosa*	0.1	1.1
Kutki	*Neopicrorhiza scrophulariifolia*	0.1	1.0
Rato Chyaau	*Laetiporus sulphureus*	0.1	0.5
Bikh	*Aconitum spicatum*	0.1	0.1
Nirmasi	*Delphinium denudatum*	0.1	0.1

b) Prioritized species and productivity

Yarshagumba, Kutki, Padamchal, Timur, Nigalo, Satuwa, Nirmasi, Ratochyau, Sadharan Chyau, Dalechuk and Jatamasi are most prioritized plant based NTFPs by the local communities of Chame CAMC. In this CAMC, the potential habitats of commercial species like Yarshagumba, Kutki, Guchhichyau, Nirmasi and Sadharan chyau are higher than other species.

Table 88: Prioritized NTFPS with their habitat and production potential in Chame

S.N.	Local Name	Scientific Name	Potential Habitat Area (Ha)	Wt/Plant (gm)	Wt/ha (Kg)	Sustainable amount to harvest (Kg/Ha)
1	Yarshagumba	*Ophiocordyceps sinensis*	1662.1	3.33	0.025	0.0022
2	Kutki	*Neopicrorhiza scrophulariifolia*	986.9	8.0	8.4	6.72
3	Timur	*Zanthoxylum armatum*	95.2	40.1	21.3	16.96
4	Nigalo	*Thamnocalamus spathiflorus*	63.7	85.0	85.7	68.56
5	Guchhichyau	*Morchella esculenta*	1234.1	10.1	0.2	0.16
6	Satuwa	*Paris polyphylla*	807.5	8.0	1.2	0.96
7	Nirmasi	*Delphinium denudatum*	1974.0	12.3	1.5	1.2
8	Chyau	*Ganoderma lucidum*	430.2	100	3.1	2.48
9	Dalechuk	*Hippophae salicifolia*	637.1	130	52.3	41.84
10	Jatamansi	*Nardostachys jatamansi*	986.9	17.3	6.5	5.2
11	Sadharan chyau	*Ganoderma sps*	430.2	17.1	3.2	2.56
12	Lokta	*Daphne bholua*	986.9	100	16.5	13.2

S.N.	Local Name	Scientific Name	Potential Habitat Area (Ha)	Wt/Plant (gm)	Wt/ha (Kg)	Sustainable amount to harvest (Kg/Ha)
13	Bikh	*Aconitum spicatum*	1974.0	11.5	1.6	1.28
14	Kakoli (Ban Lasun)	*Fritillaria cirrhosa*	1662.1	12.8	6.7	5.36
15	Setakchini	*Polygonatum verticillatum*	807.5	135	2.4	1.92
16	Padamchal	*Rheum australe*	1560.6	12	4.1	3.28
17	Lauth Salla	*Taxus wallichiana*	203.8	4050	75.0	60
18	Niguro	*Matteuccia struthiopteris*	986.9	34	9.5	7.6
19	Kurilo	*Asparagus officinalis*	1560.6	15	35.7	28.56

3.9.6.3 Dharapani CAMC (Manang UCO)

Area: 5020 ha (2.6% of UCO, 0.7% of ACA)

Potential NTFPs: Ban Lasun, Satuwa, Nirmasi, Kutki, Guchhichyau, Bish, Sugandawal, Timur, Chiraito and Setekchini.

a) Ecological assessment

In the forest area of Dharapani CAMC, locally preferred NTFPs are unavailable at canopy layer. Ecologically Lauth salla has potential to harvest in Dharapani CAMC but local people did not consider it as preferred species. Ecologically dominancy of other NTFPs are available in the understory and ground vegetation. Locally preferred NTFPs Nigalo (PV = 1.8), Timur (PV = 0.5), Lokta (PV = 0.2) and Dhatelo (PV = 0.1) are more prominence in understory layer. In the ground vegetation higher prominence of Satuwa (PV = 1.6), Kakoli/Ban Lasun (PV = 1.1), kutki (PV = 1.0) and Chyau (PV = 0.5) are recorded.

Table 89: Dominance and Prominence of Potential plant based NTFPs in Dharapani CAMC

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Lauth Salla	*Taxus wallichiana*	27.0	35.2	23.7	85.9
Shrub					
Species	**Scientific Name**		**Frequency**		**PV**
Nigalo	*Thamnocalamus spathiflorus*		0.2		1.8
Timur	*Zanthoxylum armatum*		0.1		0.5
Allo	*Girardinia diversifolia*		0.1		0.8
Lokta	*Daphne bholua*		0.1		0.2
Dhatelo	*Prinsepia utilis*		0.1		0.1

Herb			
Species	**Scientific Name**	**Frequency**	**PV**
Kutki	*Neopicrorhiza scrophulariifolia*	0.1	1.0
Chyau	*Ganoderma lucidum*	0.1	0.5
Kakoli (Ban Lasun)	*Fritillaria cirrhosa*	0.1	1.1
Satuwa	*Paris polyphylla*	0.1	1.6
Bish	*Aconitum spicatum*	0.1	0.1
Nirmasi	*Delphinium denudatum*	0.1	0.1
Jatamansi	*Nardostachys jatamansi*	0.1	0.1

b) Prioritized species and productivity

Ban Lasun, Kutki, Timur, Nigalo, Satuwa, Nirmasi, Guchhichyau, Bish, Sugandhawal, Dalechuk, Chiraito, Setakchini and Jatamasi are most prioritized plant based NTFPs by the local communities of Dharapani CAMC. In this CAMC, the potential habitats of commercial species like Ban Lasun, Kutki, Timur, Nigalo, Satuwa, Nirmasi, Guchhichyau, Bish, Chiraito, Setakchini and Jatamasi are higher than other species.

Table 90: Prioritized NTFPS with their habitat and production potential in Dharapani CAMC

SN	Local Name	Scientific Name	Potential Habitat Area (ha)	Wt/Plant (gm)	Wt/Ha (Kg)	Sustainable amount to harvest (Kg/Ha)
1	Kakoli (Ban Lasun)	*Fritillaria cirrhosa*	1230.9	12.8	2.6	1.95
2	Kutki	*Neopicrorhiza scrophulariifolia*	873.9	8.0	8.4	6.7
3	Timur	*Zanthoxylum armatum*	1484.3	40.1	21.2	17.0
4	Satuwa	*Paris polyphylla*	1236.9	8.0	1.3	1.0
5	Nirmasi	*Delphinium denudatum*	1932.4	12.3	1.7	1.4
6	Nigalo	*Thamnocalamus spathiflorus*	333.7	85.0	90.7	72.6
7	Guchhichyau	*Morchella esculenta*	1444.8	10.1	0.2	0.2
8	Bish	*Aconitum spicatum*	1118.1	11.5	1.5	1.2
9	Sugandhawal	*Valeriana jatamansi*	739.0	30.5	1.3	1.0
10	Siltimur	*Litsea cubeba*	406.1	27.5	4.1	3.3
11	Dalechuk	*Hippophae salicifolia*	637.1	130.0	52.3	41.8
12	Lokta	*Daphne bholua*	1932.4	306.0	104.0	83.2

SN	Local Name	Scientific Name	Potential Habitat Area (ha)	Wt/Plant (gm)	Wt/Ha (Kg)	Sustainable amount to harvest (Kg/Ha)
13	Dhatelo	*Prinsepia utilis*	37.1	10.2	50.0	40.0
14	Setakchini	*Polygonatum verticillatum*	739.0	135.0	15.0	12.0
15	Jatamasi	*Nardostachys jatamansi*	1118.1	17.3	6.7	5.4
16	Lauth Salla	*Taxus wallichiana*	749.0	4050.0	81.5	65.3
17	Chiraito	*Swertia chirayita*	66.5	20.4	10.5	8.4
18	Chyau	*Ganoderma lucidum*	54.0	100.0	17.0	14.45

3.9.6.4 Ghyaru CAMC (Manang UCO)

Area: 1360 ha (0.7% of UCO, 0.2% of ACA)

Potential NTFPs: Yarshagumba, Ban Lasun, Sunpati, Bhojpatra, Padamchal and Dhupi.

a) Ecological assessment

In the forest area of Ghyaru CAMC, locally preferred NTFPs, Bhojpatra (IVI = 85.4) and Dhupi (IVI = 161.5) are available at canopy layer. Ecologically Dhupi has potential to harvest in Ghyaru CAMC. Ecologically dominancy of other NTFPs is available in the understory and ground vegetation of this CAMC. Sunpati (PV = 1.2) is more prominence in understory layer. In the ground vegetation higher prominence of Padamchal (PV = 0.4), Ban Lasun (PV = 0.2) and Yarshagumba (PV = 0.1) are recorded.

Table 91: Dominance and Prominence of Potential plant based NTFPs in Ghyaru CAMC

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Dhupi	*Juniperus indica*	54.6	51.2	55.7	161.5
Bhojpatra	*Betula utilis*	24.2	21.0	40.2	85.4
Shrub					
Species	**Scientific Name**		**Frequency**		**PV**
Rosa	*Rosa sericea*		0.3		16.4
Sunpati	*Rhododendron anthopogon*		0.2		1.2
Herb					
Species	**Scientific Name**		**Frequency**		**PV**
Padamchal	*Rheum austral*		0.1		0.4
Kakoli (Ban Lasun)	*Fritillaria cirrhosa*		0.1		0.2

Yarshagumba	*Ophiocordyceps sinensis*	0.1	0.1

b) Prioritized species and productivity

Yarshagumba, Ban Lasun, Padamchal, Sunpati, Bhojpatra and Dhupi are most prioritized plant based NTFPs by the local communities of Ghyaru CAMC. In this CAMC, the potential habitats of commercial species like Yarshagumba, Padmchal, Sunpati and Dhupi are higher than other species. In terms of production all prioritized species have harvestable in this CAMC.

Table 92: Prioritized NTFPS with their habitat and production potential in Ghyaru CAMC

SN	Local Name	Scientific Name	Potential Habitat Area (ha)	Wt/Plant (gm)	Wt/Ha (Kg)	Sustainable amount to harvest (Kg/Ha)
1	Kakoli (Ban Lasun)	*Fritillaria cirrhosa*	561.6	12.8	1.6	1.28
2	Yarshagumba	*Ophiocordyceps sinensis*	2516.2	3.3	0.011	0.009
3	Sunpati	*Rhododendron anthopogon*	197.6	44.0 (Lf)	2.72	2.17
				0.81 (Fl)	0.13	0.10
4	Dhupi	*Juniperus indica*	124.0	3095.0	70.0	56.0
5	Padamchal	*Rheum austral*	51.6	12.0	4.1	3.28
6	Nirmasi	*Delphinium denudatum*	581.0	12.3	1.7	1.36

3.9.6.5 Khangsar CAMC (Manang UCO)

Area: 17770 ha (9.1% of UCO, 2.3% of ACA)

Potential NTFPs: Yarshagumba, Nirmasi, Kutki, Jatamasi, Sunpati, Ban Lasun, Padamchal, Panchaule and Pongar

a) Ecological assessment

Due to its location in Trans Himalayan zone, forest canopy is absent in Khangsar CAMC. Ecological dominancy of NTFPs are available in the understory and ground vegetation of this CAMC. Locally preferred NTFPs Dhupi (PV = 4.8) and Sunpati (PV= 2.90) are more prominence in understory layer. In the ground vegetation higher prominence of Padamchal (PV = 1.28) Jatamasi (PV = 1.12) and Ban Lasun (PV = 0.1) are recorded.

Table 93: Dominance and Prominence of Potential plant based NTFPs in Khangsar CAMC.

Shrub			
Species	**Scientific Name**	**Frequency**	**PV**
Rosa	*Rosa sericea*	0.31	21.39
Dhupi	*Juniperus indica*	0.3	4.8
Sunpati	*Rhododendron anthopogon*	0.2	2.90
Herb			
Species	**Scientific Name**	**Frequency**	**PV**
Padamchal	*Rheum austral*	0.2	1.28
Jatamansi	*Nardostachys jatamansi*	0.1	1.12
Kakoli (Ban Lasun)	*Fritillaria cirrhosa*	0.1	0.1

b) Prioritized species and productivity

Yarshagumba, Ban Lasun, Nirmasi, Sunpati, Kutki, Padamchal, Jatamasi, Pongar and Dhupi are most prioritized plant based NTFPs by the local communities of Khangsar CAMC. In this CAMC, the potential habitats of commercial species like Yarshagumba, Nirmasi, Ban Lasun, Sunpati, Kutki, Padamchal, Jatamasi and Dhupi are higher than other species.

Table 94: Prioritized NTFPs with their habitat and production potential in Khangsar CAMC

SN	**Local Name**	**Scientific Name**	**Potential Habitat Area (ha)**	**Wt/Plant (gm)**	**Wt/Ha (Kg)**	**Sustainable amount to harvest (Kg/Ha)**
1	Yarshagumba	*Ophiocordyceps sinensis*	1632.6	3.3	0.026	0.0023
2	Kakoli (Ban Lasun)	*Fritillaria cirrhosa*	1464.2	12.8	6.9	5.52
3	Sunpati	*Rhododendron anthopogon*	52.8	44.0 (Lf)	21.72	17.38
				0.81 (Fl)	0.13	0.10
4	Kutki	*Neopicrorhiza scrophulariifolia*	1632.6	8.0	8.4	6.72
5	Padamchal	*Rheum australe*	1959.1	12.0	24.1	19.28
6	Jatamansi	*Nardostachys jatamansi*	1632.6	17.3	7.5	6.0
7	Pongar	*Aconitum gammiei*	86.2	11.0	1.6	1.28
8	Dhupi	*Juniperus indica*	52.8	3095.0	70.0	56.0
9	Nirmasi	*Delphinium denudatum*	1581.0	12.3	1.7	1.36

3.9.6.6 Manang CAMC (Manang UCO)

Area: 9200 ha (4.7% of UCO, 1.2% of ACA)

Potential NTFPs: Yarshagumba, Nirmasi, Dalechuk, Ban Lasun, Bhojpatra, Dhupi, Sunpati and Pongar

a) Ecological assessment

In the forest area of Manang CAMC, locally preferred NTFPs like Bhojpatra (IVI = 134.5) and Dhupi (IVI = 35.5) are available at canopy layer. Ecologically Dhupi has potentialt harvest in Manang CAMC. Ecological dominancy of NTFPs is available in the understory and ground vegetation of this CAMC. Locally preferred NTFPs Sunpati (PV = 2.8) and Bhuichuk/Bhuin chuk (PV = 1.0) are more prominence in understory layer. In the ground vegetation higher prominence of Jatamasi (PV = 1.0), Kutki (PV = 0.4), Ban Lasun (PV = 0.2) and Yarshagumba (PV = 0.2) are recorded.

Table 95: Dominance and Prominence of Potential plant based NTFPs in Manang CAMC.

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Bhojpatra	*Betula utilis*	51.0	41.8	41.7	134.5
Dhupi	*Juniperus indica*	16.9	14.7	3.9	35.5
Shrub					
Species	**Scientific Name**	**Frequency**		**PV**	
Rosa	*Rosa sericea*	0.1		4.0	
Sunpati	*Rhododendron anthopogon*	0.2		2.8	
Bhuichuk/Bhuin chuk	*Hippophae tibetana*	0.1		1.0	
Herb					
Species	**Scientific Name**	**Frequency**		**PV**	
Jatamansi	*Nardostachys jatamansi*	0.1		1.0	
Kutki	*Neopicrorhiza scrophulariifolia*	0.1		0.4	
Kakoli (Ban Lasun)	*Fritillaria cirrhosa*	0.1		0.2	
Yarshagumba	*Ophiocordyceps sinensis*	0.1		0.2	

b) Prioritized species and productivity

Yarshagumba, Bhuichuk/Bhuin chuk, Ban Lasun, Sunpati, Kutki, Jatamasi, Pongar and Dhupi are most prioritized plant based NTFPs by the local communities of Manang CAMC. In this CAMC, the potential habitats of commercial species like Yarshagumba, Bhuichuk/Bhuin chuk, Pongar, Ban Lasun, Sunpati, Kutki, Jatamasi and Dhupi are higher than other species.

Table 96: Prioritized NTFPS with their habitat and production potential in Manang

SN	Local Name	Scientific Name	Potential Habitat Area (ha)	Wt/Plant (gm)	Wt/ha (Kg)	Sustainable amount to harvest (Kg/Ha)
1	Yarshagumba	*Ophiocordyceps sinensis*	1834.3	3.3	0.033	0.030
2	Kakoli (Ban Lasun)	*Fritillaria cirrhosa*	1828.9	12.8	6.9	5.52
3	Sunpati	*Rhododendron anthopogon*	524.0	58.0 (Lf)	24.72	19.77
				0.81 (Fl)	0.15	0.12
4	Kutki	*Neopicrorhiza scrophulariifolia*	1828.9	8.0	8.1	6.48
5	Jatamansi	*Nardostachys jatamansi*	1828.9	17.3	7.3	5.84
6	Pongar	*Aconitum gammiei*	186.2	11.0	1.6	1.28
7	Bhuichuk/Bhuin chuk	*Hippophae tibetana*	637.1	7.0	5.3	4.24
8	Dhupi	*Juniperus indica*	379.2	3095.0	72.0	57.6
9	Nirmasi	*Delphinium denudatum*	1578.0	12.3	1.6	1.28

3.9.6.7 Nar CAMC (Manang UCO)

Area: 40420 ha (20.7% of UCO, 5.3% of ACA)

Potential NTFPs: Yarshagumba, Ban Lasun, Lauth Salla, Pongar, Dhupi, Sunpati and Maharangi

a) Ecological assessment

In the forest area of Nar CAMC, locally preferred NTFPs like Bhojpatra (IVI = 161.1), Lauth Salla (IVI = 126.1) and Dhupi (IVI = 37.2). Ecological dominancy of NTFPs is available in the understory and ground vegetation of this CAMC. Locally preferred NTFPs Sunpati (PV= 4.8) is more prominence in understory layer. In the ground vegetation higher prominence of Maharangi (PV = 1.8), Yarshagumba (PV = 1.1), Ban Lasun (PV = 0.3) and Pongar (PV = 0.2) are recorded.

Table 97: Dominance and Prominence of Potential plant based NTFPs in Nar CAMC.

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**

Bhojpatra	*Betula utilis*	45.2	58.7	57.2	161.1
Lauth Salla	*Taxus wallichiana*	40.2	38.7	47.2	126.1
Dhupi	*Juniperus indica*	16.7	16.7	3.9	37.2
Shrub					
Species	**Scientific Name**		**Frequency**		**PV**
Sunpati	*Rhododendron anthopogon*		0.2		4.8
Herb					
Species	**Scientific Name**		**Frequency**		**PV**
Maharangi	*Maharangi emodi*		0.1		1.8
Yarshagumba	*Ophiocordyceps sinensis*		0.1		1.1
Kakoli (Ban Lasun)	*Fritillaria cirrhosa*		0.1		0.3
Pongar	*Aconitum gammiei*		0.1		0.2

b) Prioritized species and productivity

Yarshagumba, Ban Lasun, Sunpati, Maharangi, Lauth Salla, Pongar and Dhupi are most prioritized plant based NTFPs by the local communities of Nar CAMC. In this CAMC, the potential habitats of commercial species like Yarshagumba, Dale chuk, Pongar, Ban Lasun, Sunpati, Kutki, Nirmasi and Dhupi are higher than other species.

Table 98: Prioritized NTFPS with their habitat and production potential in Nar CAMC

SN	Local Name	Scientific Name	Potential Habitat Area (ha)	Wt./Plant (gm)	Wt./ha (kg)	Sustainable amount to harvest (kg/ha)
1	Yarshagumba	*Ophiocordyceps sinensis*	5632.8	3.3	0.012	0.01
2	Kakoli (Ban Lasun)	*Fritillaria cirrhosa*	448.8	12.8	6.7	5.36
3	Sunpati	*Rhododendron anthopogon*	447.4	58.0 (Lf)	27.72	22.17
				0.81 (Fl)	0.15	0.12
4	Maharangi	*Maharangi emodi*	4624.8	225.5	40.2	32.16
5	Pongar	*Aconitum gammiei*	432.4	11.0	1.6	1.28
6	Lauth Salla	*Taxus wallichiana*	157.7	4050.0	62.0	49.60
7	Dhupi	*Juniperus indica*	122.3	3095.0	75.0	60.00
8	Nirmasi	*Delphinium denudatum*	4624.8	12.3	1.6	1.28
9	Kurilo	*Asparagus officinalis*	1057.7	15.0	40.1	32.08

3.9.6.8 Ngawal CAMC (Manang UCO)

Area: 2700 ha (1.4% of UCO, 0.4% of ACA)

Potential NTFPs: Yarshagumba, Kutki, Jatamasi, Bhuichuk/Bhuin chuk, Pongar, Ban Lasun, Sunpati, and Dhupi.

a) Ecological assessment

In the forest area of Ngawal CAMC, locally preferred NTFPs, Dhupi (IVI = 165.7) is available at canopy layer. Ecologically Dhupi has potential to harvest in Ngawal CAMC. Ecologically dominancy of other NTFPs is available in the understory and ground vegetation of this CAMC. Sunpati (PV = 4.7) and Bhuichuk/Bhuin chuk (PV = 2.4) are more prominence in understory layer. In the ground vegetation higher prominence of Kutki (PV = 0.6), Jatamasi (PV = 0.5), Yarshagumba (PV = 0.1) and Ban Lasun (PV = 0.1) are recorded.

Table 99: Dominance and Prominence of Potential plant based NTFPs in Ngawal CAMC.

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Dhupi	*Juniperus indica*	56.6	53.2	57.7	165.7
Shrub					
Species	**Scientific Name**		**Frequency**		**PV**
Sunpati	*Rhododendron anthopogon*		0.2		4.7
Bhuichuk/Bhuin chuk	*Hippophae tibetana*		0.1		2.4
Herb					
Species	**Scientific Name**		**Frequency**		**PV**
Kutki	*Neopicrorhiza scrophulariifolia*		0.1		0.6
Jatamansi	*Nardostachys jatamansi*		0.1		0.5
Kakoli (Ban Lasun)	*Fritillaria cirrhosa*		0.1		0.1
Yarshagumba	*Ophiocordyceps sinensis*		0.1		0.1

b) Prioritized species and productivity

Yarshagumba, Ban Lasun, Padamchal, Sunpati, Bhojpatra and Dhupi are most prioritized plant based NTFPs by the local communities of Ngawal CAMC. In this CAMC, the potential habitats of commercial species like Yarshagumba, Padmchal, Sunpati and Dhupi are higher than other species. In terms of production all prioritized species are harvestable in this CAMC.

Table 100: Prioritized NTFPS with their habitat and production potential in Ngawal CAMC

SN	Local Name	Scientific Name	Potential Habitat Area (ha)	Wt./Plant (gm)	Wt./ha (kg)	Sustainable amount to harvest (kg/ha)
1	Kakoli (Ban Lasun)	*Fritillaria cirrhosa*	1661.9	12.8	1.6	1.28
2	Yarshagumba	*Ophiocordyceps sinensis*	354.2	3.3	0.022	0.020

SN	Local Name	Scientific Name	Potential Habitat Area (ha)	Wt./Plant (gm)	Wt./ha (kg)	Sustainable amount to harvest (kg/ha)
3	Sunpati	*Rhododendron anthopogon*	384.2	44.0 (Lf)	2.72	2.17
				0.81 (Fl)	0.13	0.1
4	Kutki	*Neopicrorhiza scrophulariifolia*	287.0	8.0	8.4	6.72
5	Jatamansi	*Nardostachys jatamansi*	275.4	17.3	6.4	5.12
6	Dhupi	*Juniperus indica*	304.2	3095.0	71.0	56.8
7	Bhuichuk/Bhuin chuk	*Hippophae tibetana*	173.2	0.7	5.3	4.24
8	Pongar	*Aconitum gammiei*	215.2	11.0	1.6	1.28

3.9.6.9 Phoo CAMC (Manang UCO)

Area: 42070 ha (21.6% of UCO, 5.5% of ACA)

Potential NTFPs: Yarshagumba, Jimbu, Ban Lasun, Pongar, Dhupi, Sunpati, Nirmasi and Maharangi

a) Ecological assessment

In the forest area of Phoo CAMC, locally preferred NTFPs like Dhupi (IVI = 37.2). Ecological dominancy of NTFPs Sunpati is available in the understory and ground vegetation of this CAMC. Locally preferred NTFPs Sunpati (PV= 0.4) is more prominence in understory layer. In the ground vegetation higher prominence of Jimbu (PV = 12.4), Maharangi (PV = 7.7), Ban Lasun (PV = 1.1) and Raltung (PV = 0.4) are recorded.

Table 101: Dominance and Prominence of Potential plant based NTFPs in Phoo CAMC.

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Dhupi	*Juniperus indica*	18.7	16.7	3.9	37.2
Shrub					
Species	**Scientific Name**		**Frequency**		**PV**
Sunpati	*Rhododendron anthopogon*		0.2		0.4
Herb					
Species	**Scientific Name**		**Frequency**		**PV**
Jimbu	*Allium hypsistum*		0.2		12.4
Maharangi	*Maharangi emodi*		0.2		7.7
Kakoli (Ban Lasun)	*Fritillaria cirrhosa*		0.2		1.1
Raltung	*Chenopodium album*		0.2		0.4

b) Prioritized species and productivity

Yarshagumba, Jimbu, Ban Lasun, Sunpati, Maharangi, Pongar, Nirmasi and Dhupi are most prioritized plant based NTFPs by the local communities of Phoo CAMC. In this CAMC, the potential habitats of commercial species like Yarshagumba, Jimbu, Pongar, Ban Lasun, Sunpati, Nirmasi and Dhupi are higher than other species.

Table 102: Prioritized NTFPS with their habitat and production potential in Phoo

SN	Local Name	Scientific Name	Potential Habitat Area (ha)	Wt/Plant (gm)	Wt/Ha (Kg)	Sustainable amount to harvest (Kg/Ha)
1	Yarshagumba	*Ophiocordyceps sinensis*	1322.1	3.3	0.035	0.032
2	Jimbu	*Allium hypsistum*	2032.5	20.0	14.3	11.44
3	Kakoli (Ban Lasun)	*Fritillaria cirrhosa*	1644.1	23.3	18.8	15.28
4	Raltung	*Chenopodium album*	54.2	8.3	20.4	16.32
5	Sunpati	*Rhododendron anthopogon*	1019.7	58.0 (Lf)	29.72	23.77
				0.81 (Fl)	0.15	0.12
6	Maharangi	*Maharangi emodi*	372.7	225.5	45.2	36.16
7	Pongar	*Aconitum gammiei*	205.3	11.0	1.8	1.44
8	Dhupi	*Juniperus indica*	3095.0	3095.0	75.0	60.0
9	Nirmasi	*Delphinium denudatum*	4624.8	12.3	1.9	1.52

3.9.6.10 Pisang CAMC (Manang UCO)

Area: 13980 ha (7.7% of UCO, 1.8% of ACA)

Potential NTFPs: Yarshagumba, Ban Lasun, Lauth Salla, Jimbu, Nirmasi, Jatamasi, Kutki, Dhupi Guchhichyau, Sadharan Chyau, Maharangi and Sunpati

a) Ecological assessment

In the Forest area of Pisang CAMC, locally preferred NTFPs, Lauth salla (IVI = 77.4) and Dhupi (IVI = 55.6) are available at canopy layer. Ecologically Bhojpatra, Lauth salla and Dhupi have potentially to harvest in Pisang CAMC. Ecologically dominancy of other NTFPs is available in the understory and ground vegetation of this CAMC. Locally preferred NTFPs Sunpati (PV = 26.8) is only prominent species in understory layer. In ground vegetation higher prominence of Kutki (PV = 10.0), Maharangi (PV = 4.8) and Jimbu (PV = 3.6) are recorded.

Table 103: Dominance and Prominence of Potential plant based NTFPs in Pisang CAMC.

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**

Bhojpatra	*Betula utilis*	28.0	26.0	37.7	91.7
Lauth Salla	*Taxus wallichiana*	22.0	31.4	24.0	77.4
Dhupi	*Juniperus indica*	24.0	19.2	12.4	55.6
Shrub					
Species	**Scientific Name**		**Frequency**		**PV**
Sunpati	*Rhodondron anthopogon*		0.3		26.8
Herb					
Species	**Scientific Name**		**Frequency**		**PV**
Kutki	*Neopicrorhiza scrophulariifolia*		0.1		10.0
Maharangi	*Maharanga emodi*		0.1		4.8
Jimbu	*Allium hypsistum*		0.1		3.6
Kakoli (Ban Lasun)	*Fritillaria cirrhosa*		0.1		0.4
Nirmasi	*Delphinium denudatum*		0.1		0.2

b) Prioritized species and productivity

Yarshagumba, Ban Lasun, Jimbu, Sunpati, Maharangi, Kutki, Nirmasi, Dhupi, Guchhi Chyau, Ratochyau, Sadharan Chyau, Lauth Salla and Jatamasi are most prioritized plant based NTFPs by the local communities of Pisang CAMC. In this CAMC, the potential habitats of commercial species like Yarshagumba, Kutki, Maharangi, Kutki, Guchhichyau, Nirmasi, Ban Lasun, Dhupi, Lauth Salla and Sadharan chyau are higher than other species.

Table 104: Prioritized NTFPs with their habitat and production potential in Pisang CAMC

SN	Local Name	Scientific Name	Potential Habitat Area (ha)	Wt/Plant (gm)	Wt/Ha (Kg)	Sustainable amount to harvest (Kg/Ha)
1	Yarshagumba	*Ophiocordyceps sinensis*	4477.9	3.3	0.012	0.01
2	Kutki	*Neopicrorhiza scrophulariifolia*	3268.2	8.0	8.4	6.72
3	Kakoli (Ban Lasun)	*Fritillaria cirrhosa*	1049.2	12.8	6.7	5.36
5	Sunpati	*Rhododendron anthopogon*	1020.4	58.0 (Lf)	21.82	17.37
				0.81 (Fl)	0.15	0.12
4	Maharangi	*Maharangi emodi*	3382.5	225.5	43.2	34.56
6	Nirmasi	*Delphinium denudatum*	4505.6	12.3	1.5	1.20
7	Chyau	*Ganoderma lucidum*	2040.2	100.0	12.4	9.92
8	Guchhichyau	*Morchella esculenta*	1434.1	10.1	7.6	6.08
9	Jatamasi	*Nardostachys jatamansi*	4505.6	17.3	6.5	5.20
10	Sadharan Chyau	*Ganoderma sp.*	2040.2	17.1	14.1	11.28
11	Dhupi	*Juniperus indica*	264.6	3095.0	74.0	59.2

SN	Local Name	Scientific Name	Potential Habitat Area (ha)	Wt/Plant (gm)	Wt/Ha (Kg)	Sustainable amount to harvest (Kg/Ha)
12	Pongar	*Aconitum spicatum*	1974.0	11.5	1.8	1.44
13	Setakchini	*Polygonatum verticillatum*	739.0	135.0	15.0	12.00
14	Lauth Salla	*Taxus wallichiana*	2040.2	4050.0	83.0	66.40

3.9.6.11 Tachain-Bagarchap CAMC (Manang UCO)

Area: 12120 ha (6.2% of UCO, 1.6% of ACA)

Potential NTFPs: Yarshagumba, Lokta, Bish, Pakhanbhed, Dhetelo, Ban Lasun, Satuwa, Nirmasi, Kutki, Guchhichyau, Timur, Chiraito and Setkchini.

a) Ecological assessment

In the forest area of Tachain Bagarchhap CAMC, locally preferred NTFPs are unavailable at canopy layer. Ecologically Dhupi (IVI = 114.0) Lauth salla (IVI = 85.9) has potential to harvest in Tachain Bagarchhap CAMC but local people did not consider it as preferred species. Ecologically dominancy of other NTFPs, Timur (PV = 6.9), Lokta (PV = 0.1) and Dhatelo (PV = 0.1) are more prominence in understory layer. In the ground vegetation higher prominence of Kakoli/Ban Lasun (PV = 0.6) Satuwa (PV = 0.4), Yarshagumba (PV = 0.3) and Nirmasi (PV = 0.3) are recorded.

Table 105: Dominance and Prominence of Potential plant based NTFPs in Tachain Bagarchhap CAMC.

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Dhupi	*Juniperus indica*	35.8	40.3	37.9	114.0
Lauth Salla	*Taxus wallichiana*	27.0	35.2	23.7	85.9
Shrub					
Species	**Scientific Name**		**Frequency**		**PV**
Timur	*Zanthoxylum armatum*		0.1		6.9
Lokta	*Daphne bholua*		0.1		0.1
Dhatelo	*Prinsepia utilis*		0.1		0.1
Herb					
Species	**Scientific Name**		**Frequency**		**PV**
Kakoli (Ban Lasun)	*Fritillaria cirrhosa*		0.1		0.6
Satuwa	*Paris polyphylla*		0.1		0.4
Yarshagumba	*Ophiocordyceps sinensis*		0.1		0.3
Nirmasi	*Delphinium denudatum*		0.1		0.3
Bikh	*Aconitum spicatum*		0.1		0.1

b) Prioritized species and productivity

Yarshagumba, Ban Lasun, Kutki, Dhatelo, Satuwa, Lokta, Nirmasi, Guchhichyau, Bish, Sugandhawal, Pakhanbed, Dalechuk, Chiraito, Setakchini and Jatamasi are most prioritized plant based NTFPs by the local communities of Tachain Bagarchhap CAMC. In this CAMC, the potential habitats of commercial species like Yarshagumba, Ban Lasun, Kutki, Satuwa, Nirmasi, Lokta, Guchhichyau, Bish, Chiraito, Setakchini and Jatamasi are higher than other species.

Table 106: Prioritized NTFPS with their habitat and production potential in Tachain Bagarchhap CAMC

SN	Local Name	Scientific Name	Potential Habitat Area (ha)	Wt/Plant (gm)	Wt/Ha (Kg)	Sustainable amount to harvest (Kg/Ha)
1	Yarshagumba	*Ophiocordyceps sinensis*	4738.0	3.3	0.013	0.011
2	Kakoli (Ban Lasun)	*Fritillaria cirrhosa*	4192.6	12.8	1.6	1.28
3	Kutki	*Neopicrorhiza scrophulariifolia*	3986.1	8.0	8.4	6.72
4	Satuwa	*Paris polyphylla*	1264.5	8.0	1.3	1.04
5	Nirmasi	*Delphinium denudatum*	4608.6	12.0	1.7	1.36
6	Pakhanbed	*Bergenia ciliata*	678.8	65.0	20.7	16.56
7	Guchhichyau	*Morchella esculenta*	1872.1	10.1	4.1	3.28
8	Dhupi	*Juniperus indica*	369.5	3095.0	70.0	56.0
9	Dalechuk	*Hippophae salicifolia*	37.1	130.0	52.3	41.84
10	Lokta	*Daphne bholua*	932.4	306.0	104.0	83.2
11	Setakchini	*Polygonatum verticillatum*	739.0	135.0	15.0	12.0
12	Jatamansi	*Nardostachys jatamansi*	4608.6	17.3	4.0	3.2
13	Lauth Salla	*Taxus wallichiana*	932.4	4050.0	55.0	44.0
14	Dhatelo	*Prinsepia utilis*	37.1	10.2	50.0	40.0

3.9.6.12 Tanki Manang (Manang UCO)

Area: 16480 ha (8.5% of UCO, 2.2% of ACA)

Potential NTFPs: Yarshagumba, Bhuichuk/Bhuin chuk, Ban Lasun, Padamchal, Dhupi, Nirmasi and Sunpati

a) Ecological assessment

In the forest area of Tanki Manang CAMC, locally preferred NTFPs like Dhupi (IVI = 200.4) and Bhojpatra (IVI = 102.6) are available at canopy layer. Ecologically Dhupi has potentially harvest in this CAMC. Ecological dominancy of NTFPs are available in the understory and ground vegetation of this CAMC. Locally preferred NTFPs Bhuichuk/Bhuin chuk (PV = 2.3) and Sunpati (PV= 0.4) is more prominence in understory layer. In the ground vegetation higher prominence of Padmchal, (PV = 2.5), Kutki (PV = 0.5), Ban Lasun (PV = 0.4) and Yarshagumba (PV = 0.1) are recorded.

Table 107: Dominance and Prominence of Potential plant based NTFPs in Tanki Manang CAMC.

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Dhupi	*Juniperus indica*	76.4	61.7	62.3	200.4
Bhojpatra	*Betula utilis*	29.6	34.3	38.7	102.6
Shrub					
Species	**Scientific Name**		**Frequency**		**PV**
Rosa	*Rosa sericea*		0.1		2.5
Bhuichuk/Bhuin chuk	*Hippophae tibetana*		0.1		2.3
Sunpati	*Rhododendron anthopogon*		0.2		0.4
Herb					
Species	**Scientific Name**		**Frequency**		**PV**
Padamchal	*Rheum austral*		0.1		2.5
Kutki	*Neopicrorhiza scrophulariifolia*		0.1		0.5g
Kakoli (Ban Lasun)	*Fritillaria cirrhosa*		0.1		0.4
Yarshagumba	*Ophiocordyceps sinensis*		0.1		0.1

b) Prioritized species and productivity

Yarshagumba, Bhuin chuk, Ban Lasun, Sunpati, Kutki, Jatamasi, Pongar and Dhupi are most prioritized plant based NTFPs by the local communities of Tanki Manang CAMC. In this CAMC, the potential habitats of commercial species like Yarshagumba, Bhuichuk/Bhuin chuk, Pongar, Ban Lasun, Sunpati, Kutki, Jatamasi and Dhupi are higher than other species.

Table 108: Prioritized NTFPS with their habitat and production potential in Tanki Manang CAMC

SN	Local Name	Scientific Name	Potential Habitat Area (ha)	Wt/Plant (gm)	Wt/Ha (Kg)	Sustainable amount to harvest (Kg/Ha)
1	Yarshagumba	*Ophiocordyceps sinensis*	3479.9	3.3	0.017	0.015
2	Kakoli (Ban Lasun)	*Fritillaria cirrhosa*	2910.0	12.8	6.9	5.52
3	Sunpati	*Rhododendron anthopogon*	19.9	58.0 (Lf)	29.72	23.77
				0.81 (Fl)	0.15	0.12

SN	Local Name	Scientific Name	Potential Habitat Area (ha)	Wt/Plant (gm)	Wt/Ha (Kg)	Sustainable amount to harvest (Kg/Ha)
4	Kutki	*Neopicrorhiza scrophulariifolia*	3381.8	8.0	9.4	7.52
5	Jatamansi	*Nardostachys jatamansi*	1828.9	17.3	7.5	6.0
6	Pongar	*Aconitum gammiei*	186.2	11.0	1.9	1.52
7	Bhuin chuk	*Hippophae tibetana*	637.1	7.0	2.3	1.84
8	Dhupi	*Juniperus indica*	1379.2	3095.0	79.0	63.2
9	Nirmasi	*Delphinium denudatum*	734.0	12.0	1.7	1.36

3.9.6.13 Thonche CAMC (Manang UCO)

Area: 17100 ha (8.8% of UCO, 2.2% of ACA)

Potential NTFPs: Ban Lasun, Satuwa, Nirmasi, Kutki, Dalechuk, Guchhichyau, Bish, Yarshagumba, Timur, Chiraito and Setekchini.

a) Ecological assessment

In the forest area of Thonche CAMC, locally preferred NTFPs, Lauth salla (IVI = 63.8) is available at canopy layer. Ecologically Dhupi and Bhojpatra have potential to harvest in Thonche CAMC but local people did not consider it as preferred species. Ecologically dominancy of other NTFPs is available in the understory and ground vegetation of the CAMC. Locally preferred NTFPs Timur (PV = 0.5), Dalechuk (PV = 0.1) and Lokta (PV = 0.1) are more prominence in understory layer. In the ground vegetation higher prominence of kutki (PV = 0.4), Ban Lasun (PV = 0.2), Satuwa (PV = 0.1) and Nirmasi (PV = 0.2) are recorded.

Table 109: Dominance and Prominence of Potential plant based NTFPs in Thonche CAMC.

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Lauth Salla	*Taxus wallichiana*	24.0	19.3	20.5	63.8
Dhupi	*Juniperus indica*	21.3	27.8	14.0	63.1
Bhojpatra	*Betula utilis*	12.2	11.1	7.9	31.2
Shrub					
Species	**Scientific Name**		**Frequency**		**PV**
Timur	*Zanthoxylum armatum*		0.1		0.5
Dalechuk	*Hippophae salicifolia*		0.1		0.1
Lokta	*Daphne bholua*		0.1		0.1

Herb			
Species	**Scientific Name**	**Frequency**	**PV**
Kutki	*Neopicrorhiza scrophulariifolia*	0.1	0.4
Kakoli (Ban Lasun)	*Fritillaria cirrhosa*	0.1	0.2
Satuwa	*Paris polyphylla*	0.1	0.1
Nirmasi	*Delphinium denudatum*	0.1	0.2

b) Prioritized species and productivity

Ban Lasun, Kutki, Timur, Nigalo, Satuwa, Nirmasi, Guchhichyau, Sugandhawal, Dalechuk, Chiraito, Setakchini and Jatamasi are most prioritized plant based NTFPs by the local communities of Dharapani CAMC. In this CAMC, the potential habitats of commercial species like Ban Lasun, Kutki, Timur, Nigalo, Satuwa, Nirmasi, Guchhichyau, Chiraito, Setakchini and Jatamasi are higher than other species.

Table 110: Prioritized NTFPs with their habitat and production potential in Thonche CAMC

SN	Local Name	Scientific Name	Potential Habitat Area (ha)	Wt/Plant (gm)	Wt/Ha (Kg)	Sustainable amount to harvest (Kg/Ha)
1	Kakoli (Ban Lasun)	*Fritillaria cirrhosa*	6287.9	12.8	1.6	1.28
2	Kutki	*Neopicrorhiza scrophulariifolia*	6304.6	8.0	8.4	6.72
3	Timur	*Zanthoxylum armatum*	601.3	40.1	21.2	16.96
4	Satuwa	*Paris polyphylla*	568.2	8.0	1.3	1.04
5	Nirmasi	*Delphinium denudatum*	6290.1	12.0	1.7	1.36
6	Guchhichyau	*Morchella esculenta*	1372.5	10.1	4.2	3.36
7	Lauth Salla	*Taxus wallichiana*	1133.4	8053.6	119.6	95.68
8	Dalechuk	*Hippophae salicifolia*	15.0	130.0	52.3	41.84
9	Siltimur	*Litsea cubeba*	103.5	27.5	4.1	3.28
10	Yarshagumba	*Ophiocordyceps sinensis*	6792.2	3.3	0.004	0.0036
11	Lokta	*Daphne bholua*	1032.4	306.0	104.0	83.2
12	Dhatelo	*Prinsepia utilis*	35.1	10.2	50.0	40.0
13	Setakchini	*Polygonatum verticillatum*	1039.0	135.0	15.0	12.0
14	Jatamansi	*Nardostachys jatamansi*	4056.0	17.3	3.5	2.8

3.9.7 Sikles UCO

Sikles, one of the three UCOs representing Kaski district in Nepal, covers 6.12% (46,716 hectares) of the ACA. The Sikles UCO includes seven CAMCs from sub-tropical to nival climatic zones: Parche, Namarjung, Mijuredada, Bhachok, Saimarang, Thumakodada, and Sildujure. A recent study identified 68 NTFPs within this UCO, with 33 being prioritized by the local population. Among the most favored NTFPs by the CAMCs of Sikles UCO are Niguro, Chiraito, Kurilo, and Satuwa.

Table 111: Prioritized NTFPs of Sikles UCO with harvesting protocol

S. N.	Local Name	Scientific Name	CAMCs	Frequency	Harvesting Protocol
1	Allo	*Girardinia diversifolia*	7	100	Collect bark from 2 years or more matured plants after releasing seeds in October-November. Three years rotation and reserve at least 25% production and area for regeneration are recommended.
2	Kurilo	*Asparagus racemosus*	7	100	Harvest leaves with small twigs using sharp sickle care mother plant to survive. Collect optimum 75% of the population.
3	Niguro	*Diplazium maximum*	7	100	Harvest young shoots using sharp sickle care mother plant to survive. Collect optimum 75% of the population.
4	Titepati	*Artemisia indica*	7	100	Collect mature plant materials (seeds are fully formed, matured, dried and disseminated). Collect optimum 85% of the population. Rational harvesting ensuring sustainable production.
5	Tusa	*Drepanostachyum falcatum*	7	100	Rational harvesting maintaining at least 5 plots. Reserve about 25% of harvesting area and production for sustainable regeneration. Harvest shoots using sharp sickle care mother plant to survive. Harvest only matured and outer shoots of culm.
6	Nigalo	*Thamnocalamus spathiflorus*	7	100	Rational harvesting maintaining at least 5 plots. Reserve about 25% of harvesting area and production for sustainable regeneration.

S. N.	Local Name	Scientific Name	CAMCs	Frequency	Harvesting Protocol
					Harvest leaves with small twigs using sharp sickle care mother plant to survive. Harvest only matured and outer shoots of culm.
7	Sisnu	*Urtica dioica*	7	100	Collect bark from 2 years or more matured plants after releasing seeds in October-November. Three years rotation and reserve at least 25% production and area for regeneration are recommended.
8	Ban tarul	*Dioscorea hamiltonii*	6	85.7	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
9	Chiraito	*Swertia chirayita*	6	85.7	Collect mature plant materials (seeds are fully formed, matured, dried and disseminated). Collect optimum 85% of the population. Rational harvesting ensuring sustainable production.
10	Dhatelo	*Prinsepia utilis*	5	71.4	Avoid mechanical harvesting, Pick the fruits using hand or thrashed with a stick without damaging the branches. Avoid lopping/cutting of fruiting branches during fruit collection. Maximum allowable harvest quantity 90% of fruits. Harvest mature ripe fruits before dissemination.
11	Satuwa	*Paris polyphylla*	5	71.4	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.

S. N.	Local Name	Scientific Name	CAMCs	Frequency	Harvesting Protocol
12	Indreni	*Trichosanthes tricuspidate*	4	57.1	Avoid mechanical harvesting, Pick the fruits using hand or thrashed with a stick without damaging the branches/ climbers. Avoid lopping/cutting of fruiting branches during fruit collection. Maximum allowable harvest quantity 90% of fruits. Harvest mature ripe fruits before dissemination.
13	Lokta	*Daphne bholua*	4	57.1	Collect plant bark from the end of September or mid-October continuing into late Spring to mid-May (Kartik to Jestha) with two months break in the coldest months of mid-December to mid-February (Poush to Magh). Select only the plants of 10 cm or more circumference girth and 8-10 years or more aged stems for bark collection. Cut the matured stems at 15/30 cm above the ground for letting better coppicing and root system safe. Collect optimum 75% of the population.
14	Timur	*Zanthoxylum armatum*	4	57.1	Avoid mechanical harvesting, Pick the fruits using hand or thrashed with a stick without damaging the branches. Avoid lopping/cutting of fruiting branches during fruit collection. Maximum allowable harvest quantity 90% of fruits. Harvest mature ripe fruits before dissemination.
15	Majitho	*Rubia manjith*	4	57.1	Collect mature plant materials (seeds are fully formed, matured, dried and disseminated). Collect optimum 85% of the population. Rational harvesting ensuring sustainable production.
16	Chiple Kaaulo	*Machilus duthiei*	4	57.1	Avoid mechanical harvesting; collect bark using sharp knife and peel of the bark along tree trunk.

S. N.	Local Name	Scientific Name	CAMCs	Frequency	Harvesting Protocol
					Strict to make wound size- 20cm wide* 80 cm long* 1 cm deep and > 30 cm spaces between wounds. Extract the bark from one third (33%) o\proportion of tree trunk.
17	Chutro	*Berberis aristata*	3	42.9	Avoid mechanical harvesting; collect bark using sharp knife and peel of the bark along tree trunk. Strict to make wound size- 20cm wide* 80 cm long* 1 cm deep and > 30 cm spaces between wounds. Extract the bark from one third (33%) proportion of tree trunk.
18	Gujargano	*Stephania glandulifera*	2	28.6	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
20	Tejpat	*Cinnamomum tamala*	3	42.9	**Bark:** Avoid mechanical harvesting; collect bark using sharp knife and peel of the bark along tree trunk. Strict to make wound size- 20cm wide* 80 cm long* 1 cm deep and > 30 cm spaces between wounds. Extract the bark from one third (33%) o\proportion of tree trunk. **Leaves:** Avoid mechanical harvesting; harvest leaves with small twigs using sharp sickle care mother plant to survive. Collect optimum 80% of leaves. Avoid lopping/cutting of trees and branches during leaf collection.

S. N.	Local Name	Scientific Name	CAMCs	Frequency	Harvesting Protocol
21	Bayajaro	*Smilax aspera*	3	42.9	Harvest leaves with small twigs using sharp sickle care mother plant to survive. Collect optimum 75% of the population.
22	Amriso	*Thysanolaena maxima*	3	42.9	Avoid mechanical harvesting, collect the inflorescences using hand without damaging the mother plants. Rational harvesting ensuring sustainable production. Maximum allowable harvest quantity 90% of population.
23	Siltimur	*Litsea cubea*	3	42.9	Avoid mechanical harvesting, Pick the fruits using hand or thrashed with a stick without damaging the branches. Avoid lopping/cutting of fruiting branches during fruit collection. Maximum allowable harvest quantity 90% of fruits. Harvest mature ripe fruits before dissemination.
24	Lauth salla	*Taxus wallichiana*	3	42.9	Avoid mechanical harvesting; collect bark using sharp knife and peel of the bark along tree trunk. Strict to make wound size- 20cm wide* 80 cm long* 1 cm deep and > 30 cm spaces between wounds. Extract the bark from one third (33%) o\proportion of tree trunk. Collect optimum 80% of leaves. Avoid lopping/cutting of trees and branches during leaf collection.
25	Ban Lasun	*Allium wallichii*	2	28.6	Harvest leaves with small twigs using sharp sickle care mother plant to survive. Collect optimum 75% of the population. Leave young plants in the wild.

S. N.	Local Name	Scientific Name	CAMCs	Frequency	Harvesting Protocol
26	Ban Lasun/ Kakoli	*Fritillaria cirrhosa*	2	28.6	Avoid premature harvesting. Harvest tuber when the seeds are dispersed. Dig out tubers of matured and older plants only. Collect optimum 70% of the population.
27	Bhale sunpaati	*Rhododendron anthopogon*	2	28.6	Avoid mechanical harvesting. A maximum of 90% of flowers are allowed to be harvested.
28	Bikh	*Aconitum spicatum*	2	28.6	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
29	Kafal	*Myrica esculenta*	2	28.6	Avoid mechanical harvesting, Pick the fruits using hand or thrashed with a stick without damaging the branches. Avoid lopping/cutting of fruiting branches during fruit collection. Maximum allowable harvest quantity 90% of fruits. Harvest mature ripe fruits before dissemination.
30	Daaling dhup	*Dolomiaea macrocephala*	2	28.6	Collect mature plant materials (seeds are fully formed, matured, dried and disseminated.) Collect root optimum 70% of the population. Rational harvesting ensuring sustainable production.
31	Thulo okhati	*Astilbe rivularis*	2	28.6	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration.

S. N.	Local Name	Scientific Name	CAMCs	Frequency	Harvesting Protocol
					Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
32	Yarshagumba	*Ophiocordyceps sinensis*	2	28.6	Harvest from May to July. Pick manually by using pointed mechanical tool (like Chuche Kuto) which disperse minimal soil while digging. Collect only matured stalk. Reserve about 10% of the production area for sustainable regeneration.
33	Jatamansi (Bhutle)	*Nardostachys jatamansii*	2	28.6	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
34	Padamchal	*Rheum australe*	2	28.6	Harvest leaves with petiole (Chulthi) using sharp sickle, care mother plant to survive. Leaves: Collect optimum 75% of the population. Collect optimum 70% of the population (Tuber).
35	Panchaule	*Dactylorhiza hatagirea*	2	28.6	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature palnts to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
36	Nirmasi	*Delphinium denudatum*	2	28.6	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only.

S. N.	Local Name	Scientific Name	CAMCs	Frequency	Harvesting Protocol
					Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
37	Baanko saag	*Arisaema griffithii*	2	28.6	Harvest leaves with small twigs using sharp sickle care mother plant to survive. Collect optimum 75% of the population.
38	Kutki	*Neopicrorhiza scrophulariifolia*	2	28.6	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
39	Khiraulo/ Setak Chini	*Polygonatum cirrhifolium*	2	28.6	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
40	Bhutkesh	*Selinum tenuifolium*	2	28.6	Harvest leaves with small twigs using sharp sickle care mother plant to survive. Collect optimum 75% of the population.
41	Gurjo	*Tinospora cordifolia*	2	28.6	Collect mature plant materials (seeds are fully formed, matured, dried and disseminated).

S. N.	Local Name	Scientific Name	CAMCs	Frequency	Harvesting Protocol
					Collect optimum 85% of the population. Rational harvesting ensuring sustainable production.
42	Daale chuk	*Hippophae salicifolia*	1	14.3	Avoid mechanical harvesting, Pick the fruits using hand or thrashed with a stick without damaging the branches. Avoid lopping/cutting of fruiting branches during fruit collection. Maximum allowable harvest quantity 90% of fruits. Harvest mature ripe fruits before dissemination.
43	Dhupi	*Juniperus indica*	1	14.3	Avoid mechanical harvesting; harvest leaves with small twigs using sharp sickle care mother plant to survive. Collect optimum 80% of leaves. Avoid lopping/cutting of trees and branches during leaf collection.
44	Naagbeli	*Lycopodium clavatum*	1	14.3	Collect mature plant materials (seeds are fully formed, matured, dried and disseminated.) Collect optimum 85% of the population. Rational harvesting ensuring sustainable production.
45	Paakhanbed	*Bergenia ciliata*	1	14.3	Harvest only desired portion of the plant. Dig out tubers of matured and older plants only. Replant/leave the apical portion of tubers, immature sister bulbs, the seedling part; or immature plants to ensure regeneration. Collect optimum 70% of the population. Operate harvesting activities within areas having abundance only.
46	Rato chyaau	*Laetiporus sulphureus*	1	14.3	Collect matured plant only. Collect optimum 85% of the plant population.

S. N.	Local Name	Scientific Name	CAMCs	Frequency	Harvesting Protocol
47	Ghodtapre	*Centella asiatica*	1	14.3	Collect mature plant materials (seeds are fully formed, matured, dried and disseminated.) Collect optimum 85% of the population. Rational harvesting ensuring sustainable production.
48	Kaulo	*Machilus Odoratissima*	1	14.3	Avoid mechanical harvesting; collect bark using sharp knife and peel of the bark along tree trunk. Strict to make wound size- 20cm wide* 80 cm long* 1 cm deep and > 30 cm spaces between wounds. Extract the bark from one third (33%) o\proportion of tree trunk. Collect optimum 80% of leaves. Avoid lopping/cutting of trees and branches during leaf collection.

3.9.7.1 Bhachok CAMC (Sikles UCO)

Area: 640 ha (1.4% of UCO, 0.1% of ACA)

Potential NTFPs: Allo, Tusa, Amriso, Ban tarul, Indreni, Kurilo, Niguro, Tejpat, Titepati, Bayajaro, Pakhanbed, Satuwa, Chiraito, Ghodtapre

a) Ecological assessment

In the forest area of Bhachok CAMC, most of the locally preferred NTFPs are found in ground in the ground layer. Ecologically, Tejpat (IVI= 39.82) and Tusa (PV= 21.21) have potential to harvest. Ecological dominance of major NTFPs is available in the understory and ground vegetation of this CAMC. Locally preferred NTFP such as Tusa (PV= 21.2) is more prominent in the understory layer which is followed by Ban Tarul (PV= 12.65). In the ground vegetation, higher prominence of Allo (PV= 4.5), Amriso (PV= 2.2), Niguro (PV= 1.58) are recorded.

Table 112: Dominance and prominence of potentia plant based NTFPs in Bhachok CAMC

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Katus	*Castanopsis indica*	42.85	38.88	43.42	125.15
Tejpat	*Cinnamomum tamala*	14.28	16.65	8.89	39.82
Chilaune	*Schima walichii*	35.71	27.77	29.06	92.54
Shrub					
Species	**Scientific Name**	**Frequency**			**PV**
Tusa	*Drepanostachyum falcatum*	0.5			21.2132
Ban tarul	*Dioscorea hamiltonii*	0.4			12.64911
Herb					
Species	**Scientific Name**	**Frequency**			**PV**
Allo	*Girardinia diversifolia*	0.2			4.472136
Amriso	*Thysanolaena maxima*	0.2			2.236068
Niguro	*Diplazium maximum*	0.1			1.581139

b) Prioritized species and productivity

Allo, Tusa, Amriso, Ban tarul, Indreni, Kurilo, Niguro, Tejpat, Titepati, Bayajaro, Pakhanbed, Satuwa, Chiraito, Ghodtapre are most prioritized plant based NTFPs by the local community of Bhachok CAMC. In terms of production, all prioritized species except Kurilo and Bayajaro have harvestable quantities in this CAMC.

Table 113: Prioritized NTFPs with their habitat and production potential in Bhachok CAMC

SN	Local name	Scientific name	Potential habitat area (ha)	Wt/Plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
1	Allo	*Girardinia diversifolia*	128	60	14.32	10.74
2	Tusa	*Drepanostachyum falcatum*	320	110	78.78	59.08
3	Amriso	*Thysanolaena maxima*	128	70	11.14	10.03
4	Ban tarul	*Dioscorea hamiltonii*	256	1900	6.05	4.24
5	Indreni	*Trichosanthes tricuspidata*	64	100	7.96	7.16
6	Kurilo	*Asparagus racemosus*	192	20	4.77	3.58
7	Niguro	*Diplazium maximum*	128	18	`36	27
8	Tejpaat leaves	*Cinnamomum tamala*	128	7000	66.84	50.13
	Tejpat Bark	*Cinnamomum tamala*	128	2500	23.87	7.87
9	Titepati	*Artemisia indica*	128	140	33.42	28.41
10	Bayajaro	*Smilax aspera*	64	40	3.19	2.34
11	Pakhanbed	*Bergenia ciliata*	64	33.5	33.5	23.45
12	Satuwa	*Paris polyphylla*	64	8.5	8.5	5.95
13	Chiraito	*Swertia chirayita*	64	9	9	7.65
14	Ghodtapre	*Centella asiatica*	64	9	9	7.65
15	Sisnu	*Urtica dioica*	64	70	70	52.5

3.9.7.2 Mijuredanda CAMC (Sikles UCO)

Area: 3940 ha (8.4% of UCO, 0.5% of ACA)

Potential NTFPs: Tejpat, Allo, Titepati, Tusa, Ban tarul, Kurilo, Niguro, Kafal, Pakhanbed, Bayajaro, Chiple Kaulo, Amriso, Gurjo

a) Ecological assessment

In the forest area of Mijuredanda CAMC, locally preferred NTFP Tejpat (IVI = 175.69) and Chiple Kaaulo (IVI=16.37) is available at the canopy layer. Ecologically, Tejpat has high potential to harvest.

Ecological dominance of other NTFPs is available in the understory and ground vegetation of this CAMC. Locally preferred NTFPs Tusa (PV= 7.9) and Ban tarul (PV= 7.7) are more prominent in the understory layer. In the ground vegetation, higher prominence of Kurilo (PV=5.47), Allo (PV= 2.23), and Titepati (PV= 2.23) are recorded.

Table 114: Dominance and prominence of potential plant based NTFPs in Mijuredanda CAMC

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Tejpat	*Cinnamomum tamala*	62.5	55.5	57.69	175.69
Katus	*Castanopsis indica*	28.8	29.6	30.76	89.16
Kafal	*Myrica esculenta*	8.3	3.1	6.56	17.96
Chiple Kaulo	*Machilus duthiei*	8.3	3.1	4.97	16.37
Shrub					
Species	**Scientific Name**	**Frequency**			**PV**
Tusa	*Drepanostachyum falcatum*	0.1			7.9
Ban tarul	*Dioscorea hamiltonii*	0.1			7.7
Herb					
Species	**Scientific Name**	**Frequency**			**PV**
Kurilo	*Asparagus racemosus*	0.3			5.47
Allo	*Girardinia diversifolia*	0.2			2.23
Titepati	*Artimisia indica*	0.1			2.23
Niguro	*Diplazium maximum*	0.1			1.58
Pakhanbed	*Bergenia ciliata*	0.05			1.11

b) Prioritized species and productivity

Tejpat, Allo, Titepati, Tusa, Ban tarul, Kurilo, Niguro, Kafal, Pakhanbed, Bayajaro, Chiple kaulo, Amriso, Gurjo are most prioritized plant based NTFPs by the local community of Mijuredanda CAMC. In terms of production, all prioritized NTFPs except Bayajaro have harvestable quantities in this CAMC.

Table 115: Prioritized NTFPs with their habitat and production potential in Mijuredanda CAMC

S. N	**Local name**	**Scientific name**	**Potential habitat area (ha)**	**Wt/Plant (gm)**	**Wt/ha (kg)**	**Sustainable amount to harvest (kg/ha)**
1	Allo	*Girardinia diversifolia*	788	60	14.32	10.74
2	Ban tarul	*Dioscorea hamiltonii*	591	1950	18.62	13.03
3	Kafal	*Myrica esculenta*	394	9850	31.35	28.22

S. N	Local name	Scientific name	Potential habitat area (ha)	Wt/Plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
4	Kurilo	*Asparagus racemosus*	1182	35	16.71	12.53
5	Niguro	*Diplazium maximum*	394	10	25	18.75
6	Paakhanbed	*Bergenia ciliata*	197	45	22.5	15.75
7	Tejpat Leaves	*Cinnamomum tamala*	2955	10150	242.31	193.85
8	Tejpat Bark	*Cinnamomum tamala*	2955	8500	202.92	66.96
9	Titepati	*Artemisia indica*	788	140	33.42	28.41
10	Tusa	*Drepanostachyum falcatum*	197	110	13.13	9.85
11	Dhatelo	*Prinsepia utilis*	394	130.5	10.38	9.34
12	Bayajaro	*Smilax aspera*	197	40	1.59	1.19
13	Chiple Kaulo	*Machilus duthiei*	197	2500	7.95	2.62
14	Amriso	*Thysanolaena maxima*	197	68	34	30.6
15	Gurjo	*Tinospora sinensis*	197	70	35	24.5
16	Sisnu	*Urtica dioica*	197	70	35	26.25

3.9.7.3 Saimarang CAMC (Sikles UCO)

Area: 920 ha (2.0% of UCO, 0.1% of ACA)

Potential NTFPs: Allo, Ban tarul, Kaaulo, Kurilo, Lauth salla, Tusa, Niguro, Titepati, Sisnu, Tejpat

a) Ecological assessment

In the forest area of Saimarang CAMC, locally preferred NTFP Lauth salla (IVI= 137.8) is available at the canopy layer. Ecologically, Katus (IVI= 46.19) and Kaaulo (IVI= 44.28) has potential to harvest but local people did not consider them as preferred species. Ecological dominance of other NTFPs is available in the understory and ground vegetation of this CAMC. Locally preferred NTFPs Tusa (PV= 12.64) and Ban Tarul (PV= 6.32) are more prominent in the understory layer. In the ground vegetation, higher prominence of Niguro (PV=5.47), Kurilo (PV= 4.47), Allo (PV= 3.16), Titepati (PV= 2.23) are recorded.

Table 116: Dominance and prominence of potential plant based NTFPs in Saimarang CAMC

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Lauth salla	*Taxus wallichiana*	33.3	33.3	71.2	137.8
Katus	*Castanopsis indica*	16.6	16.6	8.9	42.1

Kaaulo	*Machilus duthiei*	16.6	16.6	7.1	40.3
Kafal	*Myrica esculenta*	16.6	16.6	7.1	40.3
Tejpat	*Cinnamomum tamala*	16.6	16.6	5.5	38.7
Shrub					
Species	**Scientific Name**	**Frequency**			**PV**
Tusa	*Drepanostachyum falcatum*	0.1			12.64
Ban tarul	*Dioscorea hamiltonii*	0.1			6.32
Herb					
Species	**Scientific Name**	**Frequency**			**PV**
Niguro	*Diplazium maximum*	0.3			5.47
Kurilo	*Asparagus racemosus*	0.2			4.47
Allo	*Girardinia diversifolia*	0.1			3.16
Titepati	*Artemisia indica*	0.1			3.16

b) Prioritized species and productivity

Lauth salla, Allo, Tusa, Ban tarul, Kurilo, Niguro, Titepati, Tejpat, Chiple Kaaulo, Sisnu, Pakhanbed, Chiraito, Bayajaro, Satuwa, Siltimur, Kafal, Tejpat are the most prioritized plant based NTFPs by the local community of Siamarang CAMC. In terms of production, all prioritized NTFPs have harvestable quantities in this CAMC.

Table 117: Prioritized NTFPs with their habitat and production potential in Saimarang CAMC

S. N.	Local name	Scientific name	Potential habitat area (ha)	Wt./Plant (gm)	Wt./ha (kg)	Sustainable amount to harvest (kg/ha)
1	Allo	*Girardinia diversifolia*	92	60	14.32	10.74
2	Ban tarul	*Dioscorea hamiltonii*	92	1950	6.21	4.35
3	Chiple Kaulo	*Machilus duthiei*	92	9850	31.35	10.35
4	Kurilo	*Asparagus racemosus*	184	35	8.36	6.27
5	Lauth salla	*Taxus wallichiana*	92	7145	45.49	15.01
6	Tusa	*Drepanostachyum falcatum*	92	350	27.85	20.89
7	Niguro	*Diplazium maximum*	276	10	40	30
8	Titepati	*Artemisia indica*	92	145	23.08	19.62
9	Sisnu	*Urtica dioica*	184	70	11.14	8.36
10	Pakhanbed	*Bergenia ciliata*	92	37.5	37.5	26.2
11	Chiraito	*Swertia chirayita*	92	12	12	9
12	Bayajaro	*Smilax aspera*	92	40	3.18	2.385
13	Satuwa	*Paris polyphylla*	92	10.5	10.5	7.35

S. N.	Local name	Scientific name	Potential habitat area (ha)	Wt./Plant (gm)	Wt./ha (kg)	Sustainable amount to harvest (kg/ha)
14	Siltimur	*Lindera neesiana*	92	70	5.57	5.013
15	Kafal	*Myrica esculenta*	92	9500	30.24	27.22
16	Tejpat	*Cinnamomum tamala*	92	4200	13.37	10.7

3.9.7.4 Thumakodanda CAMC (Sikles UCO)

Area: 1350 ha (2.9% of UCO, 0.2% of ACA)

Potential NTFPs Allo, Tusa, Ban tarul, Kurilo, Niguro, Titepati, Sisnu, Siltimur, Majitho, Amriso, Timur, Satuwa, Lokta, Kaulo, Chiraito

a) Ecological assessment

In the forest area of Thumaakodada CAMC, locally preferred NTFP Kaulo (IVI=79.24) is available at the canopy layer. Ecologically, Katus (IVI= 134.52) have potential to harvest but local people did not consider them as a preferred species. Ecological dominance of other NTFPs is available in the understory and ground vegetation of this CAMC. Locally preferred NTFPs such as Siltimur (PV= 8.94) and Ban Tarul (PV= 7.5), Tusa (PV=6.32) are more prominent in the understory layer as well as crown layers. In the ground vegetation, higher prominence of Titepati (PV= 5), Allo (PV= 4.47), Kurilo (PV= 2.25), Niguro (PV=2.23), Amriso (PV= 1.11) are recorded.

Table 118: Dominance and prominence of potential based NTFPs in Thumakodanda CAMC

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Katus	*Castanopsis indica*	42.85	42.85	48.82	134.52
Chilaaune	*Schima wallichii*	28.57	28.57	29.06	86.2
Kaulo	*Machilus Odoratissima*	28.57	28.57	22.1	79.24
Shrub					
Species	**Scientific Name**	**Frequency**			**PV**
Siltimur	*Lindera neesiana*	0.05			8.94
Ban tarul	*Dioscorea hamiltonii*	0.25			7.5
Tusa	*Drepanostachyum falcatum*	0.1			6.32
Herb					
Species	**Scientific Name**	**Frequency**			**PV**
Titepati	*Artemisia indica*	0.25			5
Allo	*Girardinia diversifolia*	0.2			4.47
Kurilo	*Asparagus racemosus*	0.25			2.25
Niguro	*Diplazium maximum*	0.2			2.23

Amriso	*Thysanolaena maxima*	0.05	1.11

b) Prioritized species and productivity

Allo, Tusa, Ban tarul, Kurilo, Niguro, Titepati, Sisnu, Siltimur, Majitho, Amriso, Timur, Satuwa, Lokta, Kaulo, Chiraito are most prioritized plant based NTFPs by the local community of Thumakodada CAMC. In terms of production, all prioritized NTFPs except Amriso, Majitho, Siltimur, Lokta, Satuwa, chiraito and Sisnu have harvestable quantities in this CAMC.

Table 119: Prioritized NTFPs with their habitat and production potential in Thumakodanda CAMC

S. N.	Local name	Scientific name	Potential habitat area (ha)	Wt/Plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
1	Allo	*Girardinia diversifolia*	270	60	14.32	10.74
2	Amriso	*Thysanolaena maxima*	67.5	65	2.59	2.33
3	Ban tarul	*Dioscorea hamiltonii*	337.5	1950	15.52	10.86
4	Kurilo	*Asparagus racemosus*	337.5	35	9.75	7.31
5	Majitho	*Rubia manjith*	67.5	55	2.19	1.64
6	Tusa	*Drepanostachyum falcatum*	135	350	69.63	52.22
7	Niguro	*Diplazium maximum*	270	10	40	30
8	Titepati	*Artemisia indica*	337.5	145	40.39	34.33
9	Siltimur	*Lindera neesiana*	67.5	70	2.75	2.5
10	Sisnu	*Urtica dioica*	67.5	65	5.17	3.88
11	Dhatelo	*Prinsepia utilis*	67.5	130.5	10.38	9.34
12	Timur	*Zanthoxylum armatum*	67.5	85	6.76	6.084
13	Satuwa	*Paris polyphylla*	67.5	14	7	4.9
14	Lokta	*Daphne bholua*	67.5	58	2.31	1.73
15	Kaulo	*Machilus Odoratissima*	135	10000	31.83	10.5039
16	Chiraito	*Swertia chirayita*	67.5	12	6	4.5
17	Sisnu	*Urtica dioica*				

3.9.7.5 Sildujure CAMC (Sikles UCO)

Area: 2750 ha (5.9% of UCO, 0.4% of ACA)

Potential NTFPs: Tusa, Ban tarul, Kurilo, Niguro, Titepati, Chutro, Majitho, Allo, Lokta, Indreni, Nagbeli, Timur, Pakhanbed, Gujargano, Chiraito, Tejpat, Rato chyau

a) Ecological assessment

In the forest area of Sildujure CAMC, locally preferred NTFP Tejpat (IVI=34.68) is available at the canopy layer. Ecological dominance of other NTFPs is available in the understory and ground vegetation of this CAMC. Locally preferred NTFPs Tusa (PV= 9.3), Chutro (PV= 7.5), Ban tarul (PV= 3.2) is more prominent in the understory layer. In the ground vegetation, higher prominence of Titepati (PV= 4.8), Niguro (PV= 2.7), Kurilo (PV= 2.4), and Allo (PV= 2.37) are recorded.

Table 120: Dominance and prominence of potential plant based NTFPs in Sildujure CAMC

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Guiya chandan	*Daphniphyllum himalense*	57.72	57.14	56.59	171.45
Chilaune	*Schima wallichii*	28.86	28.57	37.42	94.85
Tejpat	*Cinnamomum tamala*	14.43	14.28	5.97	34.68
Shrub					
Species	**Scientific Name**	**Frequency**			**PV**
Tusa	*Drepanostachyum falcatum*	0.1			9.3
Chutro	*Berberis aristate*	0.14			7.5
Ban tarul	*Dioscorea hamiltonii*	0.05			3.2
Herb					
Species	**Scientific Name**	**Frequency**			**PV**
Titepati	*Artemisia indica*	0.24			4.8
Niguro	*Diplazium maximum*	0.28			2.7
Kurilo	*Asparagus racemosus*	0.24			2.4
Allo	*Girardinia diversifolia*	0.24			2.37

b) Prioritized species and productivity

Tusa, Ban tarul, Kurilo, Niguro, Titepati, Chutro, Majitho, Allo, Lokta, Indreni, Naagbeli, Timur, Pkhanbed, Gujargano, Chiraito, Tejpat, Rato chyau are most prioritized plant based NTFPs by the local community of Sildujure CAMC. In terms of production, all prioritized NTFPs except Lokta, Timur, Rato chyau have harvestable quantities in this CAMC.

Table 121: Prioritized NTFPs with their habitat and production potential in Sildujure CAMC

S. N	Local name	Scientific name	Potential habitat area (ha)	Wt/Plant (gm)	Wt/ha (kg)	Sustainable amount to harvest (kg/ha)
1	Niguro	*Diplazium maximum*	785.71	15	56.9	42.68
2	Kurilo	*Asparagus racemosus*	654.76	40	12.13	9.1
3	Allo	*Girardinia diversifolia*	654.76	66.6	27.77	20.83
4	Lokta	*Daphne bholua*	261.9	54.2	6.16	4.62
5	Majitho	*Rubia manjith*	392.86	63	7.11	5.33
6	Ban tarul	*Dioscorea hamiltonii*	130.95	1950	14.78	10.35
7	Tusa	*Drepanostachyum falcatum*	261.9	120	18.19	13.64
8	Naagbeli	*Lycopodium clavatum*	130.95	61	2.29	1.72
9	Titepati	*Artemisia indica*	654.76	130	123.39	71.05
10	Chutro	*Berberis aristate*	392.86	213	48.44	15.99
11	Indreni	*Trichosanthes tricuspidate*	261.1	100	7.58	6.82
12	Dhatelo	*Prinsepia utilis*	261.91	130.5	14.83	13.35
13	Timur	*Zanthoxylum armatum*	130.95	65	2.47	2.22
14	Pakhanbed	*Bergenia ciliata*	130.95	42	20	14
15	Gujargano	*Cissampelos pareira*	130.95	450	17.05	11.93
16	Chiraito	*Swertia chirayita*	130.95	11	5.23	3.92
17	Tejpat Leaves	*Cinnamomum tamala*	130.95	10000	15.16	12.13
18	Tejpat Bark	*Cinnamomum tamala*	130.95	2500	3.79	1.25
19	Rato Chyaau	*Laetiporus sulphureus*	130.95	7	3.33	2.83
20	Sisnu	*Urtica dioica*	130.95	70	33.33	25

3.9.7.5 Namarjung CAMC (Sikles UCO)

Area: 28150 ha (60.3% of UCO, 3.7% of ACA)

Potential NTFPs: Allo, Ban tarul, Chiraito, Chutro, Gujargano, Gurjo, Indreni, Kurilo, Lokta, Tusa, Nigalo, Niguro, Titepati, Majitho, Satuwa, Thulo okhati, Timur, Titepati, Bhale sunpati and Daaling dhup.

a) Ecological assessment

In the forest area of Namarjung CAMC, locally preferred NTFP Chiple Kaulo (IVI=32.23) and Lauth salla (IVI=53.17) are available at the canopy layer. Ecological dominance of other NTFPs is available in the understory and ground vegetation of this CAMC. Locally preferred NTFPs Siltimur (PV= 10.77), chutro (PV= 7.77), Tusa (PV= 7.62), Timur (PV= 5.44) are more prominent in the understory layer. In the ground vegetation, higher prominence of Titepati (PV=5.67), Kurilo (PV= 2.54), Allo (PV= 2.37), Niguro (PV= 2.08) are recorded.

Table 122: Dominance and prominence of potential plant based NTFPs in Namarjung CAMC

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Katus	*Castanopsis indica*	28.57	31.57	39.02	99.17
Laligurans	*Rhododendron arboretum*	21.42	26.31	22.39	70.13
Lauth salla	*Taxus wallichiana*	21.42	15.78	15.95	55.03
Chiple Kaulo	*Machilus duthiei*	14.28	10.52	7.42	32.23
Shrub					
Species	**Scientific name**	**Frequency**		**PV**	
Siltimur	*Litsea cubeba*	0.15		10.77	
Chutro	*Berberis aristata*	0.1		7.77	
Tusa	*Drepanostachyum falcatum*	0.06		7.62	
Timur	*Zanthoxylum armatum*	0.06		5.44	
Herb					
Species	**Scientific name**	**Frequency**		**PV**	
Titepati	*Artemisia indica*	0.32		5.67	
Kurilo	*Asparagus racemosus*	0.26		2.54	
Allo	*Girardinia diversifolia*	0.23		2.37	
Niguro	*Diplazium maximum*	0.16		2.08	

Chiraito	*Swertia chirayita*	0.06	1.27

b) Prioritized species and productivity

Allo, Ban tarul, chiraito, chutro, gujargano, gurjo, Indreni, Kurilo, lokta, Tusa, Nigalo, Niguro, Titepati, majitho, Satuwa, Siltimur, Thulo okhati, Timur, Titepati, Bhale sunpati, Bhutkesh, Daaling dhup are most prioritized plant based NTFPs by the local community of Namarjung CAMC. In terms of production, all prioritized NTFPs except Chiraito, Gujargano, Bhutkesh, Indreni, Lokta, Satuwa, Thulo okhati, Bikh, and Yarshagumba, Panchaule, Setak chini have harvestable quantities in this CAMC.

Table 123: Prioritized NTFPs with their habitat and production potential in Namarjung CAMC

S. N.	Species	Scientific name	Potential Habitat	Wt./plant (gm)	Wt./ha (Kg)	Sustainable amount to harvest
1	Allo	*Girardinia diversifolia*	6356.45	66.6	25.64	19.23
2	Siltimur	*Lindera neesiana*	3632.26	150	26.95	24.255
3	Timur	*Zanthoxylum armatum*	1816.13	30	7.7	6.93
4	Titepati	*Artemisia indica*	9080.65	130	80.09	68.0765
5	Tusa	*Drepanostachyum falcatum*	1816.13	120	24.64	18.48
6	Chutro	*Berberis aristata*	2724.19	210	21.56	7.1148
7	Ban tarul	*Dioscorea hamiltonii*	1816.13	350	26.95	18.865
8	Kurilo	*Asparagus racemosus*	7264.52	40	10.27	7.7025
9	Niguro	*Diplazium maximum*	4540.32	15	58.06	43.545
10	Lokta	*Daphne bholua*	908.06	54.2	2.78	2.085
11	Nigalo	*Thamnocalamus spathiflorus*	3632.26	80	22.59	16.9425
12	Thulo okhati	*Astilbe rivularis*	2724.19	40	3.08	2.156
13	Chiraito	*Swertia chirayita*	1816.13	3	1.94	1.649
14	Gujargaano	*Stephania glandulifera*	1816.13	80	4.11	2.877
15	Gurjo	*Tinospora cordifolia*	908.06	50	16.13	12.1
16	Indreni	*Trichosanthes tricuspidata*	908.06	100	2.57	2.313
17	Satuwa	*Paris polyphylla*	908.06	5	1.61	1.127
18	Daaling dhup	*Dolomiaea macrocephala*	908.06	180.5	4.63	3.9355
19	Bhale Sunpati	*Rhododendron anthopogon*	908.06	480	12.32	11.088
20	Bikh	*Aconitum spicatum*	908.06	13.5	4.35	3.045

S. N.	Species	Scientific name	Potential Habitat	Wt./plant (gm)	Wt./ha (Kg)	Sustainable amount to harvest
21	Yarshagumba	*Ophiocordyceps sinensis*	908.06	5.5	0.035	0.031
22	Baanko saag	*Arisaema griffithii*	4540.32	45.4	11.65	8.7375
23	Padamchaal	*Rheum australe*	908.06	67.2	5.18	3.626
24	Panchaule	*Dactylorhiza hatagirea*	908.06	4.3	1.39	0.973
25	Jatamansi	*Nardostachys jatamansi*	908.06	17.3	5.58	3.906
26	Nirmasi	*Delphinium denudatum*	1816.13	12.3	7.94	5.558
27	Kutki	*Neopicrorhiza scrophulariifolia*	908.06	14.4	4.65	3.255
28	Setak chini	*Polygonatum cirrhifolium*	908.06	43.5	2.23	1.561
29	Dhatelo	*Prinsepia utilis*	2724.19	130.5	13.4	12.06
30	Bhutkesh	*Selinum tenuifolium*	908.06	15	4.83	3.38
31	Ban lasun (Kakoli)	*Fritillaria cirrhosa*	908.06	2.3	1.48	1.03
32	Majitho	*Rubia manjith*	1816.13	35	22.58	15.80
33	Chiple kaulo	*Machilus duthiei*	1816.13	9500	19.59	6.43
34	Lauth salla	*Taxus walliciana*	2724.19	7500	23.10	7.62
35	Sisnu	*Urtica dioica*	908.06	70	22.58	16.93

3.9.7.6 Parche CAMC (Sikles UCO)

Area: 8970 ha (19.2% of UCO, 1.2% of ACA)

Potential NTFPs: Allo, chiraito, chutro, gujargano, Indreni,Kurilo, lokta, Tusa, Niguro, Titepati, Majitho, Satuwa, Siltimur, Thulo okhati, Timur, Titepati, Bhale sunpati, Daaling dhup, Nirmasi, Bikh, Padamchal, Bhutkesh, Setak chini, Panchaule, Lauth Salla, Kaulo and Ban Lasun.

a) Ecological assessment

In the forest area of Parche CAMC, locally preferred NTFPs Lauth salla (IVI= 75.7) and kaaulo (IVI= 25.4) are available at the canopy layer. Ecological dominance of other NTFPs is available in the understory and ground vegetation of this CAMC. Locally preferred NTFPs Chutro (PV= 19.75), Tusa (PV= 12.49), Lokta (PV= 6.25), Timur (PV= 4.68), Sunpati (PV= 3.31) is more prominent in understory layer. In the ground vegetation, higher prominence of Allo (PV=8.83), Kurilo (PV= 6.63), Titepati (PV= 6.25), Niguro (PV= 4.06) are recorded.

Table 124: Dominance and prominence of potential plant based NTFPs in Parche CAMC

Tree					
Species	**Scientific Name**	**RF**	**RD**	**RDO**	**IVI**
Laligurans	*Rhododendron arboretum*	53.3	50	37.8	141.1
Lauth salla	*Taxus wallichiana*	20	18.7	37	75.7
Katus	*Castanopsis indica*	20	18.7	18.8	57.5
Kaaulo	*Machilus duthiei*	6.6	12.5	6.3	25.4
Shrub					
Species	**Scientific Name**	**Frequency**			**PV**
Chutro	*Berberis aristate*	0.26			19.75
Tusa	*Drepanostachyum falcatum*	0.1			12.49
Lokta	*Daphne bholua*	0.1			6.25
Timur	*Zanthoxylum armatum*	0.05			4.68
Sunpati	*Rhododendron anthopogon*	0.05			3.31
Herb					
Species	**Scientific Name**	**Frequency**			**PV**
Allo	*Girardinia diversifolia*	0.2			8.83
Kurilo	*Asparagus racemosus*	0.2			6.63
titepati	*Artemisia indica*	0.1			6.25
Niguro	*Diplazium maximum*	0.07			4.06
Chiraito	*Swertia chirayita*	0.1			1.75

b) Prioritized species and productivity

Allo, Chiraito, Chutro, gujargano, Indreni,Kurilo, lokta, Tusa, Niguro, Titepati, majitho, Satuwa, Siltimur, Thulo okhati, Timur, Titepati, Bhale sunpati, Daaling dhup, Nirmasi, Bikh, Padamchaal, Bhutkesh, Setak chini, Panchaule, Lauth salla, Kaaulo, Ban lasun, datelo, are most prioritized plant based NTFPs by the local community of Parche CAMC. In terms of production, all prioritized NTFPs except lokta, sunpati, Baako saag, Yarshagumba, satuwa, Thulo okhati, Panchaule, jatamansi, setak chini, Bikh, Majitho, Bhutkesh, Ban lasun have harvestable quantity in this CAMC.

Table 125: Prioritized NTFPs with their habitat and production potential in Parche CAMC

S.N.	**Species**	**Scientific name**	**Potential Habitat**	**Wt./plant (gm)**	**Wt./ ha (Kg)**	**Sustainable amount to harvest**
1	Chutro	*Berberis aristata*	2187.8	208	60.56	19.98
2	Tusa	*Drepanostachyum falcatum*	875.12	120	27.95	20.96

S.N.	Species	Scientific name	Potential Habitat	Wt./plant (gm)	Wt./ ha (Kg)	Sustainable amount to harvest
3	Allo	*Girardinia diversifolia*	1750.24	122	61.57	46.17
4	Kurilo	*Asparagus racemosus*	1750.24	40	27.17	20.38
5	Lokta	*Daphne bholua*	875.12	58.5	4.54	3.41
6	Titepati	*Artemisia indica*	875.12	120	58.23	49.49
7	Sunpati	*Rhododendron anthopogon*	437.56	58.1	3.38	3.04
8	Timur	*Zanthoxylum armatum*	437.56	55	7.47	6.73
9	Gujargaano	*Stephania glandulifera*	437.56	200	15.53	10.87
10	Indreni	*Trichosanthes tricuspidata*	437.56	100	9.7	8.73
11	Niguro	*Diplazium maximum*	656.34	10	60.98	45.73
12	Chiraito	*Swertia chirayita*	1093.9	6.5	7.93	6.74
13	Nirmasi	*Delphinium denudatum*	437.56	12.3	9	6.3
14	Kutki	*Neopicrorhiza scrophulariifolia*	437.56	14.4	10.54	7.38
15	Baanko saag	*Arisaema griffithii*	437.56	120	6.99	5.24
16	Majitho	*Rubia manjith*	437.56	55	5.34	3.74
17	Bikh	*Aconitum spicatum*	437.56	10	4.88	3.41
18	Dale chuk	*Hippophae salicifolia*	437.56	13.2	6.44	5.8
19	Yarshagumba	*Ophiocordyceps sinensis*	437.56	5.5	0.06	0.05
20	Daaling dhup	*Jurenia dolomiaea*	218.78	180.5	3.5	2.45
21	Ban lasun	*Allium wallichii*	218.78	12.3	3	2.25
22	Satuwa	*Paris polyphylla*	218.78	8	5.85	4.1
23	Thulo okhati	*Astilbe rivularis*	218.78	40	2.33	1.63
24	Padamchal	*Rheum australe*	218.78	67.2	16.39	12.29
25	Panchaule	*Dactylorhiza hatagirea*	218.78	4.3	1.05	0.73
26	Jatamansi	*Nardostachys jatamansi*	218.78	17.3	4.22	2.95
27	Setak chini	*Polygonatum cirrhifolium*	218.78	150	2.91	2.04
28	Bhutkesh	*Selinum tenuifolium*	218.78	17.3	4.22	2.95

S.N.	Species	Scientific name	Potential Habitat	Wt./plant (gm)	Wt./ ha (Kg)	Sustainable amount to harvest
29	Chiple Kaaulo	*Machilus duthiei*	218.78	10000	15.53	5.12
30	Lauth salla	*Taxus wallichiana*	656.34	7150	16.65	5.5
31	Dhupi	*Juniperus indica*	437.56	3095	9.2	6.9
32	Sisnu	*Urtica dioica*	656.34	70	6.79	5.09
33	Dhatelo	*Prinsepia utilis*	1093.9	130.5	12.66	11.4
34	Ban lasun (Kakoli)	*Fritillaria cirrhosa*	218.78	2.3	1.12	0.78

3.10 Profile of Preferred NTFPs in ACA

1. *Ophiocordyceps sinensis* (Berk.) G.H.Sung, J.M.Sung, Hywel-Jones & Spatafora

Family: Ophicordycipitaceae

Nepali name (s): Yarshagumba

Local name (s): Keera Jhar, Jeeban buti

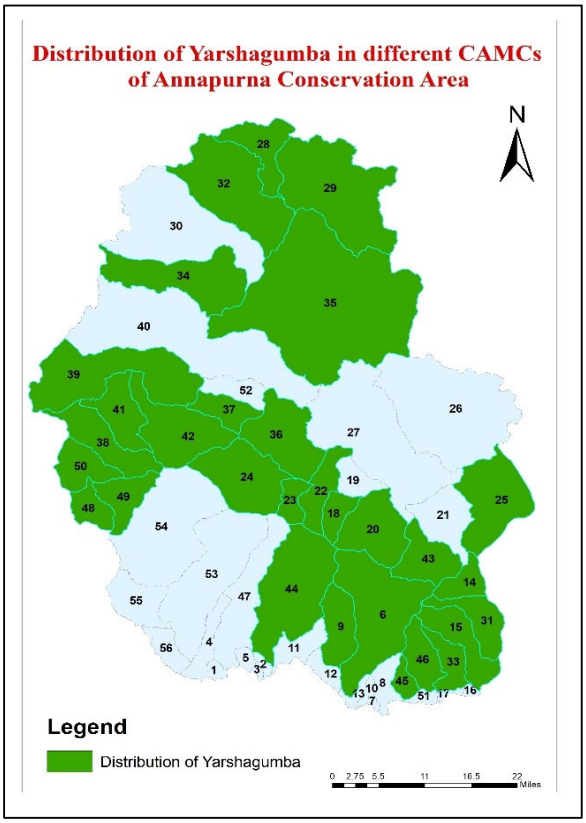
Common name (s): Caterpillar fungus

Description: It is an entomopathogenic fungus growing parasitically on larvae of a particular species of moth, Lepidoptera. The larvae of the host insect feed on roots of alpine plants and in winters, they usually die due to fungus infection and the fruiting body of the fungus comes out from the exoskeleton of the dead larvae in spring.

Ecology: It is found to be endemic to Tibetan Plateau and surrounding Himalaya in the alpine ecosystems of Bhutan, China, Nepal, Tibet and India.

Conservation and legal status
IUCN: Vulnerable
GoN: N/A
CITES: N/A

Distribution
Nepal: WC; 3540-5050m
ACA: Bhujung, Ghanapokhara, Khudi, Pasgaun, Taghring, Jhong, Muktinath, Jomsom, Tukuche, Kagbeni, Kobang, Kunjo, Lete, Marpha, Bhraka, Chame, Ghyaru, Khangsar, Manang, Nar, Ngawal, Phoo, Pisang, Tachain Bagarchhap, Tanki Manang, Thonceh, Namarjung, Parche, Chhonhup, Chhoser, Ghami, Lomanthang, Surkhang and T-sarang CAMCs.



Availability in ACA

Attributes	Amount
Area (ha)	70015.85
Quantity (kg/ha)	0.049

Current harvest, process and storage methods

Harvest period	Mid-May to July
Usable Organs/Parts	Fruiting body (stroma)

Post-harvest treatment (s)	Dry the product in sunlight and store in cotton bag
Recommendation	The unorganized gathering and excessive consumption of fuelwood need to be regulated within the harvesting area. It's imperative to organize awareness initiatives on sustainable harvesting practices and the responsible harvesting practices and responsible utilization of this resource within the local community.
No. of person involved in collection/sale	During the collection period, people of all ages from surrounding villages participate, leading to empty village and closed schools.

People's knowledge on quantity of the species:

- Well known

Local use of the species:

- The species is consumed in powdered form, often mixed with honey, milk, or water. Alternatively, it may be soaked in alcohol and consumed. Additionally, it is combined with powdered material from *Dactylorhiza hatagirea* (Panchaunle) or *Ephedra gerardiana* (Somlata). This mixture serves as a tonic, aphrodisiac, cardiotonic, and expecBhuin chuknt.

Informal/Traditional rules for conservation:

- Local community-based organizations primarily regulate access to harvesting sites, ensuring sustainable harvesting practices are followed.

Major problem in cultivation, collection/harvest:

- The main challenges in cultivation and collection/harvesting include the overgrazing of animals, unregulated gathering practices, damage from excessive trampling, extensive use of fuelwood, and deliberate fires set for fuelwood acquisition. While there has been a rise in the collection and trade of this resource, there are concerns about its declining availability.

Other information:

- N/A

Reference:

Belwal, T., Bhatt, I. D., Kashyap, D., Sak, K., Tuli, H. S., Pathak, R., Rawal R.S., Ghatnur, S. M. (2019). Ophiocordyceps sinensis. In Nonvitamin and Nonmineral Nutritional Supplements (pp. 527–537). doi:10.1016/b978-0-12-812491-8.00069-2

NTNC-CODEFUND. (2016). Annapurna Conservation Area Management Plan (2016 to 2020) Final Draft. National Trust for Nature Conservation.

2. *Neopicrorhiza scrophulariiflora* (Pennell) D.Y.Hong

Family: Plantaginaceae

Nepali name (s): Kutki

Local name (s): Kutki, Hongling

Common name (s): Hellebore, Figwort picrorhiza

Description: It is commonly known as the hairy perennial rhizomatous herb, exhibits several distinctive characteristics. It typically grows to a height of about 10 centimeters and features pale brown rhizomes covered with dead leaves. The basal leaves are alternate, ranging from oblanceolate to narrowly spathulate, with serrations in the upper half. These leaves measure between 2.5 to 6 centimeters in length and 0.9 to 1.8 centimeters in width, with a glabrous or sparingly short-glandular-hairy surface. The scapes of this plant are ascending in nature.The flowers are relatively large, measuring between 2 to 6 centimeters, and the fruit is 4 to 9 centimeters long. Both the flowers and fruits are densely covered with short, brownish-white thin hairs. The inflorescence appears in terminal racemes, typically containing 8 to 20 flowers. The bracts are ovate with acuminate blunt tips. The calyx is purplish green, 5-lobed, with lobes that are oblanceolate. The corolla is purplish blue, bilabiate, with the upper lobe around 10 millimeters and the lower lobes about 5 millimeters in size. Stamens are 4 in number, didynamous, with elliptic or oblong to reniform anthers measuring about 1 millimeter. The capsules are brown, ovoid, and swollen, typically ranging from 10 to 14 millimeters. The seeds are pale brown and reniform, measuring approximately 1 by 0.8 millimeters. Rhizomes and roots are grayish-brown with numerous circular root scars and short thin fractures, longitudinally wrinkled. It flowers from May to August and fruits from August to October. Seed dispersal occurs via wind, water, and gravity, with germination typically taking place in May or June.

Ecology: Native to the Himalayas, it thrives in rocky crevices, gravelly areas, and open pastures with moist acidic soil and high organic matter, showing a preference for north-facing slopes and some shade from small shrubs for optimal growth and survival.

Conservation and legal status

IUCN: N/A

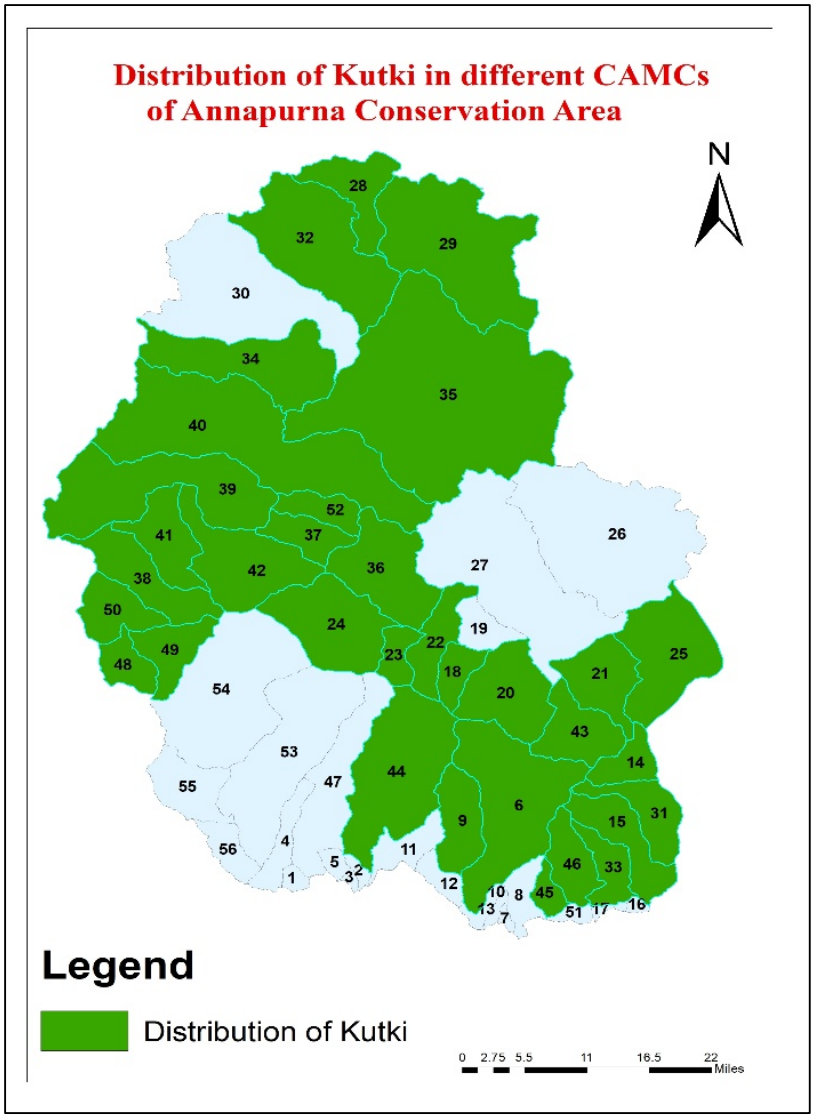
GoN: Banned for export without identification and certification

CITES: N/A

Distribution

Nepal: WCE; 3500-5000m

ACA: Bharaka, Bhujung, Chame, Chhonhup, Chhoser, Chhusang, Dharapani, Ghami, Ghanapokhara, Jhong, Jomsom, Kagbeni, Kagbeni, Khangsar, Khudi, Kobang, Kunjo, Lete, Lomanthang, Machhapuchhre, Manang, Marpha, Muktinath, Namarjung, Ngawal, Parche, Pasgaun, Pisang, Surkhang, Tachain Bagarchhap, Taghring, Tanki Manang, Thonche and Tukuche CAMCs.



Availability in ACA

Attributes	Amount
Area (ha)	60134.24
Quantity (kg/ha)	3.36

Current harvest, process and storage methods

Harvest period	October-November
Usable organs/parts	Rhizomes, Shoots
Post-harvest treatment (s)	Clean and sun-dry both rhizomes and shoots after harvesting.
Recommendation	Partial harvesting by leaving 30-40% for regeneration only after flowering of the plant

No. of person involved in collection/sale

People's knowledge on quantity of the species:

- The level of awareness among people regarding the quantity of this species is lacking, with many individuals lacking proper understanding of its population size. Due to overharvesting

and unsustainable harvesting practices, the species' quantity is declining rapidly, yet this decline often goes unnoticed by local communities.

Local use of the species:

- Used in the treatment of headache, bile disease, intestinal pain, blood and lung fever, high blood pressure, sore throat, eye disease, gastritis, cough and cold, heart diseases, cuts and diarrhea.

Informal/Traditional rules for conservation:

- Traditional conservation methods involve harvesting the roots after flower maturation and seed dispersal, as well as partially harvesting rhizomes from the plants.

Major problem in cultivation, collection/harvest:

- The primary challenge in cultivation and collection lies in the species' preference for very high altitudes with moist, rocky environments, making it difficult to cultivate artificially, while its abundance in high-altitude and rugged terrain poses challenges during the harvesting process.

Other information:

- Local amchis gathered the species with the assistance of local labor and subsequently utilized the collected individuals to prepare medicines.

Reference:

Rokaya, M. B., Parajuli, B., Bhatta, K. P., & Timsina, B. (2019). Neopicrorhiza scrophulariiflora (Pennell) Hong: A comprehensive review of its traditional uses, phytochemistry, pharmacology and safety. *Journal of Ethnopharmacology.* Advance online publication. https://doi.org/10.1016/j.jep.2019.112250

NTNC-CODEFUND. (2016). Annapurna Conservation Area Management Plan (2016 to 2020) Final Draft. National Trust for Nature Conservation.

3. *Delphinium denudatum* Wall.

Family: Ranunculaceae

Nepali name (s): Nirmasi

Local name (s): Bhongar, Nirbikh

Common name (s): Larkspur, Blood veined sage

Description: It is a 40-80 cm tall herb. The leaves of this plant measure between 5-15 cm in diameter, with a rounded outline and divided into 3-5 broadly ovate segments. Each segment is further divided into oblong lobes or teeth measuring 2-3 mm wide. The flowers are regular, bisexual, and approximately 2.5 cm long, featuring upper outer petals measuring 1.2 cm and a spur measuring 1.4-1.5 cm. The upper inner petals are white, while the remaining petals are blue. The perianth may either be simple or split into a corolla and a calyx, with numerous free stamens. In regular flowers, the carpels are typically numerous, while zygomorphic flowers have fewer carpels. The fruit is either an etaerio of follicles, achenes, or a berry. A scaly leaf bud is present at the crown, and scattered flowers produce light blue seeds with small endosperms. Rhizome is dark brownish-black, measuring between 3 cm to 6.5 cm in length and 1 cm to 2 cm in width at the crown. It has a conical shape, is exceptionally hard, and is externally coated with a suberized metaderm. Numerous small circular scars, remnants of lateral roots, are present on its surface.

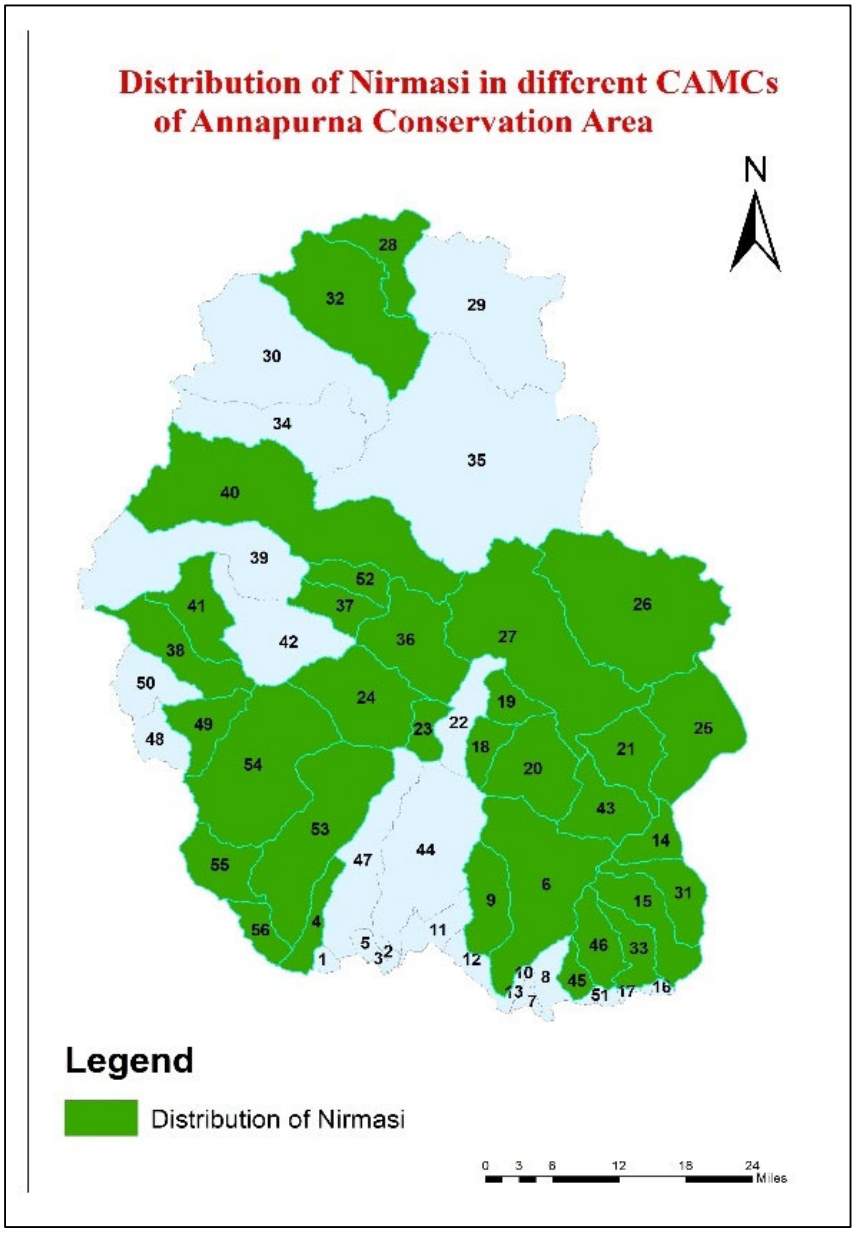
Ecology: The plant is commonly found in dry scrubby slopes or grassy slopes and forest clearings. It requires open sunny areas for its growth.

Conservation and legal status
IUCN: N/A
GoN: N/A
CITES: N/A

Distribution

Nepal: WC; 1300-4500m

ACA: Bhraka, Bhujung, Chame, Chhonhup, Chhusang, Dangsing, Dharapani, Ghandruk, Ghanpokhara, Ghyaru, Jhong, Khangsar, Khudi, Kobang, Kunjo, Lomanthang, Lumle, Manang, Marpha, Muktinath, Namarjung, Nar, Narchang, Parche, Pasgaun, Phoo, Pisang, Shikha, Tachain Bagarchhap, Taghring, Tanki Manang, Thonceh and Tukuche CAMCs



Availability in ACA

Attributes	Amount
Area (ha)	57093.64
Quantity (Kg/ha)	2.53

Current harvest, process and storage methods

Harvest period	Oct-Nov
Usable organs/parts	Root

Post-harvest treatment (s)	Washing, Boiling, Drying and Grinding
Recommendation	Rotational harvesting should be done
No. of person involved in collection/sale	N/A

People's knowledge on quantity of the species:

- Well known

Local use of the species:

- It exhibits beneficial effects in treating a diverse range of conditions, including fungal infections, paralysis, epilepsy, facial palsy, migraine, insanity, mania, hysteria, atony, numbness, tremors, infantile convulsions, cholera, jaundice, cardiac diseases, arthritis, palpitation, rheumatism, toothache, aconite poisoning, snake bites, scorpion stings, and various types of pain.

Informal/Traditional rules for conservation:

- It includes implementing measures to sustainably conserve, manage, and utilize Nirmasi through the establishment of a social calendar focused on organized collection efforts.

Major problem in cultivation, collection/harvest:

- Excessive harvesting, premature and immature collection, unauthorized gathering, and grazing by domestic animals.

Other information:

- Its roots have been found to be beneficial in treating a variety of conditions such as aconite poisoning, brain diseases, fungal infections, piles, and toothaches. DD contains numerous bioactive compounds, including flavonoids, triterpenoids, and alkaloids such as delphocurarine, staphisagrine, delphine, condelphine, denudatin, delnudine, delnuline, vilmorri anonymouse, vilmorrianone, and diterpinoid alkaloid.

Reference:

Aleem, M., Ahmad, E., & Anis, M. (2020). Botany, phytochemistry, pharmacology and Unani traditional uses of Jadwar (Delphinium denudatum Wall.): A Review. *The Journal of Phytopharmacology, 9*, 378-383. https://doi.org/10.31254/phyto.2020.9516

NTNC-CODEFUND. (2016). Annapurna Conservation Area Management Plan (2016 to 2020) Final Draft. National Trust for Nature Conservations.

4. *Paris polyphylla* Sm.

Family: Melanthiaceae

Nepali name (s): Satuwa

Local name (s): Satuwa

Common name (s): Paris root, Love Apple

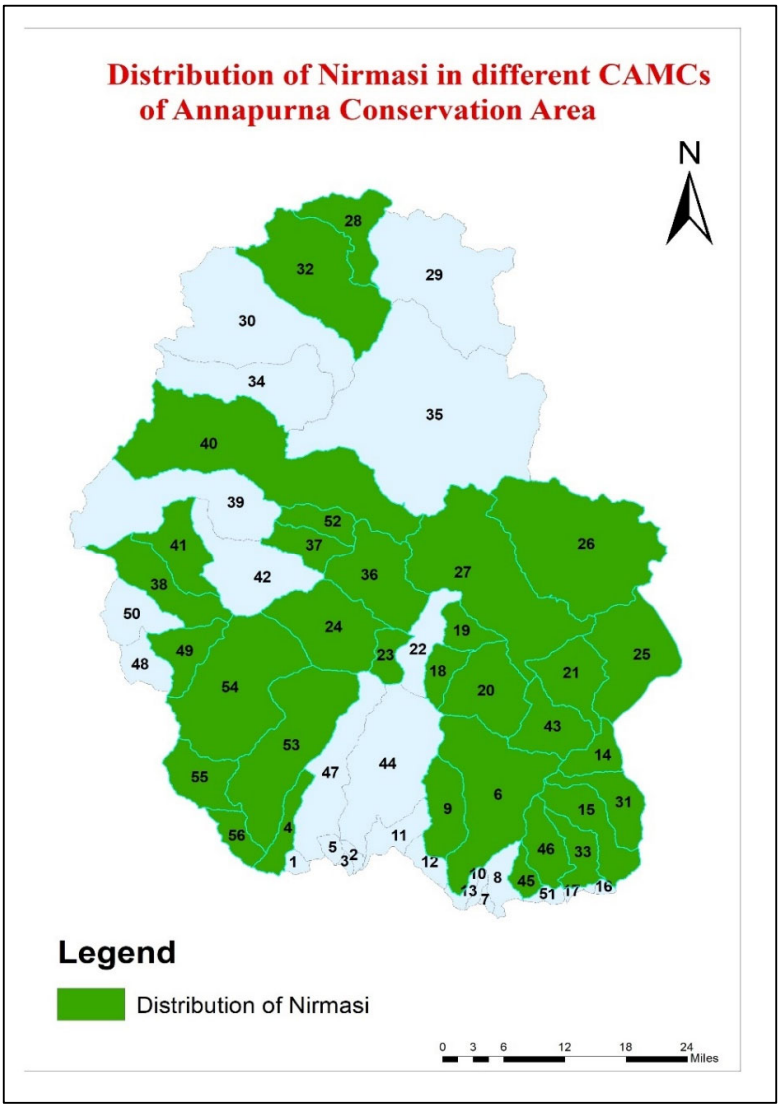
Description: It is a smooth, upright herb standing at 30-45 cm tall, characterized by a dense, creeping rootstock. It thrives in temperate regions at altitudes ranging from 1800 to 3000 m. The lanceolate leaves are clustered in a whorl at the apex of the stem, surrounding a single flower at the center. The outer perianth is green, while the inner one appears yellow or yellowish-green. Its capsules are spherical and yellowish-brown, containing numerous scarlet seeds.

Ecology: Grows under canopy of moist temperate forest in Nepal. Flourishes on thickets, grassy or rocky slopes of damp, humus, nitrogen and phosphorus rich soil under the canopy of the forest. It grows in undisturbed areas with a canopy cover of more than 80%. It is found in sub-tropical to alpine zones.

Conservation and legal status
IUCN: Vulnerable
GoN: N/A
CITES: N/A

Distribution
Nepal: WCE; 1800-3500m
ACA: Bhachok, Bhoje, Bhujung, Chame, Dangsing, Dharapani, Ghachok, Ghandruk, Ghanapokhara, Ghara, Khudi, Kunjo, Lete, Lumle, Lwang-Ghalel, Machhapuchhhre, Namarjung, Narchang, Parche,

Pasgaun, Rivan, Saimarang, Sardikhola, Shikha, Tachain Bagarchhap, Taghring, Thonche, Thumakodanda, CAMCs.



Availability in ACA

Attributes	Amount
Area (ha)	46977.12
Quantity (kg/ha)	19.17

Current harvest, process and storage methods

Harvest period	September-October
Usable organs/parts	Rhizomes
Post-harvest treatment (s)	Clean and sun-dry rhizomes after harvesting
Recommendation	Partial harvesting only after flowering
No. of person involved in collection/sale	In Machhapuchhre and Lwang-ghalel regions, there is a bidding process for the collection of rhizomes, whereas in other areas, rhizomes are gathered for local consumption.

People's knowledge on quantity of the species:

- Poor knowledge among people about its quantity and people are haphazardly collecting it and no sustainable harvesting practices.

Local use of the species:

- Used against snake bites, insect bites to alleviate narcotic effects, wounds, fever and food poisoning.
- Fed to cattle to lessen diarrhea and dysentery.
- Used against various diseases and injuries like fever, backpain, bleeding, fractured bones, fungal diseases, skin allergy, tumors and variety of cancers.

Informal/Traditional rules for conservation:

- Rules to harvest the root after the flower matures and seeds disperse. Rhizomes to be partially harvest from the plants.

Major problem in cultivation, collection/harvest:

- The lack of knowledge regarding its commercial cultivation, coupled with its preference for specific environments and abundance in high-altitude and rugged terrain, poses significant challenges to cultivation and harvesting processes.

Other information:

- This plant has limited distribution, slow growth rate, high demand, illegal harvesting, destructive harvesting practices and habitat degradation constraint's the plant's distribution, use, trade and conservation.

Reference:

Kunwar, R. M., Adhikari, Y. P., Sharma, H. P., Rimal, B., Devkota, H. P., Charmakar, S., Acharya, R. P., Baral, K., Ansari, A. S., Bhattarai, R., Thapa-Magar, S., Paudel, H. R., Baral, S., Sapkota, P., Uprety, Y., LeBoa, C., & Jentsch, A. (2020). Distribution, use, trade and conservation of Paris polyphylla Sm. in Nepal. *Global Ecology and Conservation* 23.

Thapa, C. B., Paudel, M. R., Bhattarai, H. D., Pant, K. K., Devkota, H. P., Adhikari, Y. P., & Pant, B. (2022). Bioactive secondary metabolites in Paris polyphylla Sm. and their biological activities: A review. *Heliyon 8* https://doi.org/10.1016/j.heliyon.2022.e08982

NTNC-CODEFUND. (2016). Annapurna Conservation Area Management Plan (2016 to 2020) Final Draft. National Trust for Nature Conservation.

5. *Rheum australe* D.Don

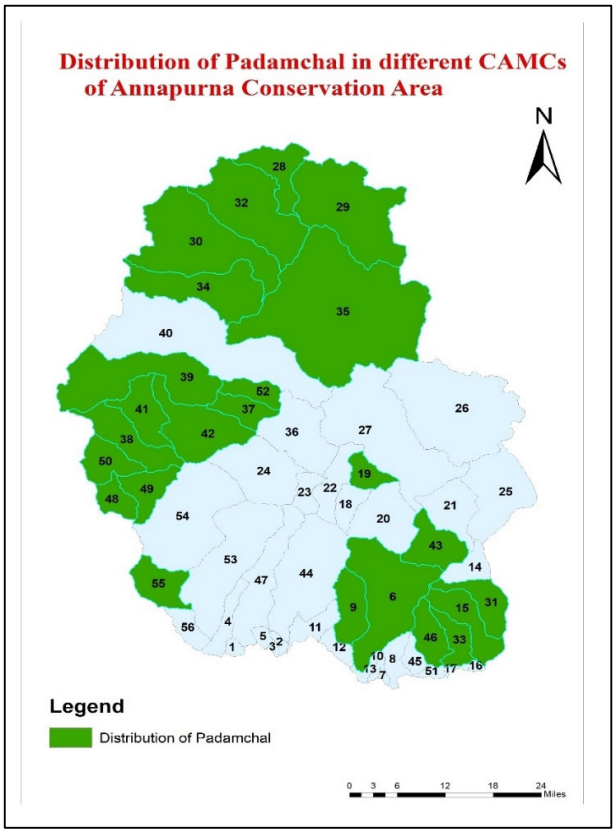
Family: Polygonaceae

Nepali name (s): Akashe chuk, Padamchal, Chulthi amilo, Shankhatra

Local name (s): Akase chuk

Common name (s): Himalayan Rhubarb, Red-veined Pie Plant

Description: It is a robust, perennial herb with stout rhizomes, growing 1-3 meters tall. Its stems are usually hairless but may have fine hairs at nodes. Basal leaves have long petioles, thick blades, orbicular to ovate-elliptic shapes, with 5-7 basal veins, smooth margins, and obtuse apex. Upper leaves are smaller. The inflorescence is large, densely branched, and papilliferous. Flowers are dark purple with spreading perianth and slender filaments. The ovary is rhomboid-obovoid, and the stigma is rough. Fruits are ovoid-ellipsoid, purple, with narrow wings and notched ends. It flowers from June to August and fruits from July to September.



Ecology: It is native to the Himalayan region and can be found in Bhutan, China (southern Tibet or S. Xizang), India (Kashmir, Sikkim), Myanmar, Nepal, and Pakistan. It typically thrives in grassy or rocky slopes at higher elevations, ranging from 3200 to 5200 meters. Additionally, it also grows along forest margins within this altitude range.

Conservation and legal status
IUCN: Data deficient
GoN: N/A
CITES: N/A

Distribution
Nepal: WCE; 3200-4400m

ACA: Bhujung, Chame, Chhonhup, Chhoser, Ghami, Ghanapokhara, Ghyaru, Jhong, Jomsom, Kagbeni, Khudi, Kobang, Kunjo, Lete, Lomanthang, Marpha, Muktinath, Namarjung, Parche, Shikha, Surkhang, Taghring, T-sarang and Tukuche CAMCs

Availability in ACA

Attributes	Amount

Area (ha)	39012.69
Quantity (Kg/ha)	6.75

Current harvest, process and storage methods

Harvest period	September-November
Usable organs/parts	Whole plant mainly stems and rhizome
Post-harvest treatment (s)	Store it after sun-drying
Recommendation	Avoid complete harvesting
No. of person involved in collection/sale	N/A

People's knowledge on quantity of the species:

- Well known

Local use of the species:

- Widely used in ethnomedical treatments such as constipation, stomachache, dysentery, blood disorders, broken or fractured bones and sprains.
- Root used as dye; leaf-stalks are eaten raw or boiled, sprinkled with salt and water.

Informal/Traditional rules for conservation:

- N/A

Major problem in cultivation, collection/harvest:

- Lack cultivation techniques and difficult as it has habitat-specific growth.

Other information:

- Develop cultivation techniques and for commercialization of this plant, natural germplasm should be preserved.

Reference:

Rokaya, M. B., Münzbergová, Z., Timsina, B., & Bhattarai, K. R. (2012). *Rheum australe*D. Don: A review of its botany, ethnobotany, phytochemistry and pharmacology. *Journal of Ethnopharmacology, 141*(3), 761–774. https://doi.org/10.1016/j.jep.2012.03.048

NTNC-CODEFUND. (2016). Annapurna Conservation Area Management Plan (2016 to 2020) Final Draft. National Trust for Nature Conservation.

6. *Girardinia diversifolia* (Link) Friis

Family: Urticaceae

Nepali name: Allo

Local name: Thulo sisnu, Chalne sisnu, Gainda sisnu

Common name: Himalayan nettle

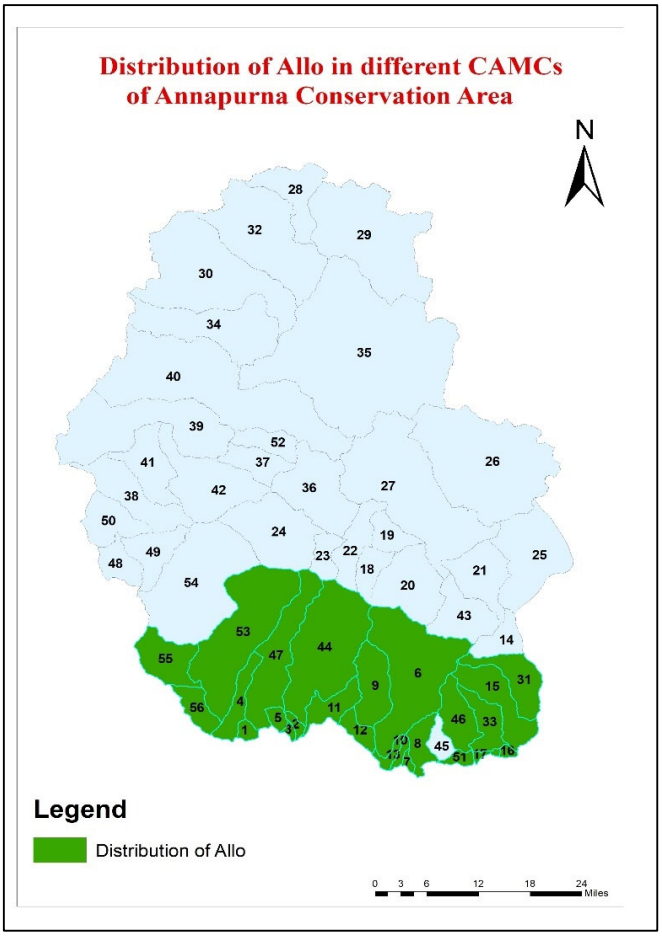
Description: A perennial herb that can grow up to 2 meters tall, covered in stinging hairs, with broadly ovate leaves that are palmately divided into 3 to 7 lobes, though the lower leaves may be unlobed. This plant has unisexual flowers, with male and female flowers on separate plants, arranged in panicles.

Ecology: It occurs in sub-tropical to temperate zones.

Conservation and legal status:

IUCN: N/A
GON: N/A
CITES: N/A

Distribution:
Nepal: WCE; 900-3000 m
ACA: Bhachok, Bhoje, Bhujung, Dangsing, Dhampus, Ghachok, Ghandruk, Ghanapokhara, Ghara, Khudi, Lahachok, Lumle, Lwang-Ghalel, Machhapuchhre, Mijuredanda, Namarjung, Parche, Rivan, Saimarang, Sardikhola, Shikha, Sildujure, Simpani, Taghring, Thumaakodanda and Uttarkanya CAMCs



Availability in ACA

Attributes	Amount
Area (ha)	32796.98
Quantity (kg/ha)	43.9

Current harvest, process and storage methods

Harvest period	November to December
Usable organs/parts	Root, Leaves, Inflorescence, Seeds and Bark
Post-harvest treatment (s)	Drying green bark, Boiling, washing and drying with kamero mato
Recommendation	Avoid overharvesting
No. of person involved in collection/sales	Whole family especially women

People's knowledge on quantity of species:

- Well-known

Local use of the species:

- Fibers use for weaving coarse cloths to make Dhokro, fishing nets, bags, Namlo, Damlo and Bhangre Topi.
- Root juice provides cooling effect for drunkard.
- Vegetable- tender parts boiled and eaten.

Informal/traditional rules for conservation:

- N/A

Major problem in cultivation, collection/harvest:

- N/A

Other information

- Population pressure leads to a decline to the species and lack of enough information about the botany, weaving, marketing and domestication process.

References:

Barakoti, T. P., & Shrestha, K. P. (2008). Commercial utilization of Allo (Girardinia diversifolia) by the Rais of Sankhuwasabha for income generation. *Banko Janakari, 18*(1), 9-16.

Dutta, I.C. (2007*). Non Timber Forest Products of Nepal: Identification, Classification, Ethnic Uses and Cultivation.* HillSide Press(P) Ltd

7. *Swertia chirayita* (Roxb.) H.Karst.

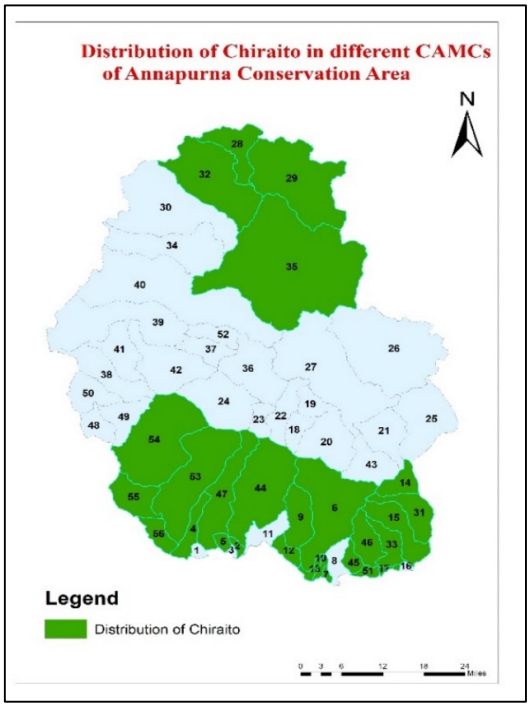
Family: Gentianaceae

Nepali name (s): Chiraito, Tikta

Local name (s):

Common name (s): Chiretta

Descriptions: It is herbaceous plant that can grow annually or biennially, reaching heights of 0.6–1.5 meters. It features an upright stem, approximately 2–3 feet long, with a cylindrical middle portion and quadrangular upper portion distinguished by prominent decurrent lines at each angle. The stem exhibits colors ranging from orange-brown to purplish, containing large continuous yellowish pith. The lanceolate leaves grow in opposite pairs, lack stalks, and are acuminate, cordate at the base, and sessile, with five to seven nerves, measuring around 4 cm in length. The root is simple, yellowish, somewhat oblique or geniculate, tapering and short, typically 7–8 cm long and half an inch thick. The plant produces numerous small flowers arranged in large leafy panicles, with green-yellow coloration and tinged with purple and green or white hairs. The calyx is gamophyllous with four lobes, while the corolla has four twisted and superimposed lobes, united at the base with pairs of nectaries on each lobe covered with long hairs. Stamens are present in fours, positioned opposite the corolla lobes at the base. The ovary is unilocular with laminal placentation parietale and two stigmas. Capsules are egg-shaped, 2-valved, with a transparent yellowish pericarp, containing numerous very small, dark brownish seeds. The presence of a multi-colored corolla and nectaries suggests cross-pollination in S. chirayita.



Ecology: Open and forest areas of Himalayan regions, temperate to sub-alpine zones

Conservation and legal status
IUCN: N/A
GoN: N/A
CITES: N/A

Distribution
Nepal: CE; 1500-2500 m
ACA: Bhachok, Bhoje, Bhujung, Chhonhup, Chhoser, Dangsing, Dharapani, Ghachok, Ghandruk, Ghanapokhara, Khudi, Lomanthang, Lumle, Lwang-ghalel, MAchhapuchhre, Namarjung, Narchang, Parche, Pasgaun, Rivan, Saimarang, Shikha, Sildujure, Surkhang, Taghring, Thumakodanda and Uttarkanya CAMCs

Availability in ACA

Attributes	Amount
Area (ha)	23367.4
Quantity (kg/ha)	19.96

Current harvest, process and storage methods

Harvest period	November-December
Usable organs/parts	Whole plant
Post-harvest treatment (s)	Make bundle and sell after sun-dry
Recommendation	Control open grazing and harvest the plant after it reaches maturity
No. of person involved in collection/sale	N/A

People's knowledge on quantity of the species:

- Well known

Local use of the species:

- It has been widely used for the treatment of hepatitis, inflammation and digestive diseases.
- The plant's root is believed to be highly potent, promoting healthy bile discharge and serving as a remedy for individuals with gout.
- Boil the plant with water and drink the infusion to relieve fever.

Informal/Traditional rules for conservation:

- N/A

Major problem in cultivation, collection/harvest:

- Cultivation land does not support proper growth of the plant.
- Cultivated varieties lack the beneficial properties found in their natural counterparts.

Other information:

- The plant is utilized for a variety of medicinal purposes, including treating chronic fever, malaria, anemia, bronchial asthma, hepatotoxic disorders, liver disorders, hepatitis, gastritis, constipation, dyspepsia, skin diseases, worms, epilepsy, ulcers, scanty urine, hypertension, melancholia, certain mental disorders, bile secretion, blood purification, and diabetes.

Reference:

Kumar, V., & Van Staden, J. (2016). A Review of Swertia chirayita (Gentianaceae) as a Traditional Medicinal Plant. Frontiers in Pharmacology, 6:308. https://doi.org/10.3389/fphar.2015.00308

NTNC-CODEFUND. (2016). Annapurna Conservation Area Management Plan (2016 to 2020) Final Draft. National Trust for Nature Conservation

8. *Asparagus racemosus* Willd.

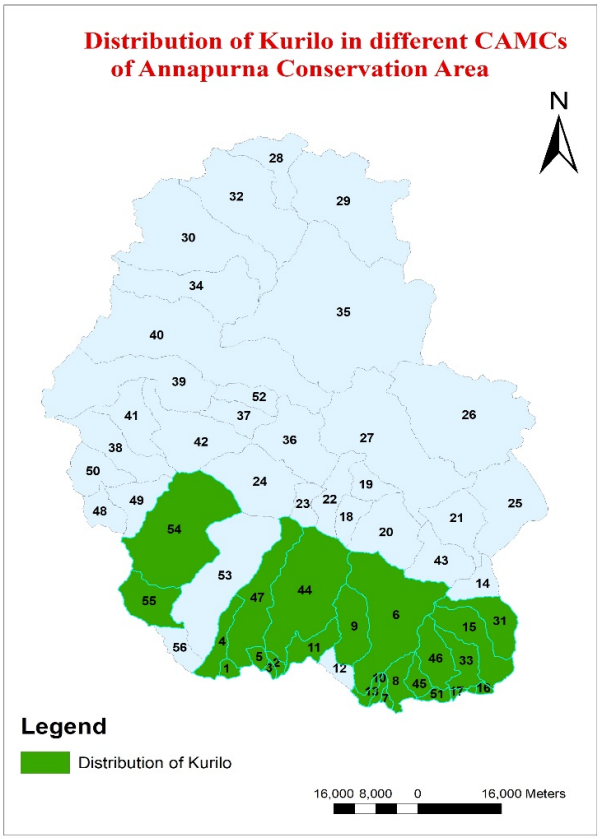
Family: Asparagaceae

Nepali name (s): Kurilo, Satawari, Jhirjhire kanda

Local name (s): Kepi, Pujutaro, Theta

Common name (s): Satavar, Shatavari

Description: A vigorously climbing, extensively branched, spiny undershrub, with a tuberous, short rootstock bearing numerous roots, measuring 30-100 cm in length and 1-2 cm in thickness. It is commonly found growing wild in tropical and sub-tropical regions of Nepal, reaching altitudes of up to 1500m. The stems are woody, whitish-gray or brown, armed with strong, straight or curved spines measuring 5-13mm in length. The cladodes are somewhat needle-like, arranged in pairs of 2-6, curved, and finely pointed. Leaves are reduced to almost upright or slightly recurved spines. The flowers are white, fragrant, and small, appearing profusely in simple or branched racemes up to 7 cm long. The berries are round, scarlet, three-lobed, and 4-6 mm in diameter.



Ecology: Broad-leaved forests along streams or valleys

Conservation and legal status
IUCN: N/A
GoN: N/A
CITES: N/A

Distribution
Nepal: WCE; 300-2200 m
ACA: Bhachok, Bhoje, Bhujung, Dhampus, Ghachok, Ghanapokhara, Khudi, Lahachok, Lumle, Lwang-ghalel, Machhapuchhre, Mijuredanda, Namarjung, Narchang, Parche, Pasgaun, Rivan, Saimarang, Sardikhola, Shikha, Simpani, Taghring, Thumaakodanda and Uttarkanya CAMCs

Availability in ACA

Attributes	Amount

Area (ha)	26009.01
Quantity (kg/ha)	17.0205

Current harvest, process and storage methods

Harvest period	April-July
Usable organs/parts	Whole plant
Post-harvest treatment (s)	Air-dry for 2-3 days, then thoroughly pack the fully seasoned roots into sacks.
Recommendation	Maintain sustainable harvesting
No. of person involved in collection/sale	N/A

People's knowledge on quantity of the species:

- Well known

Local use of the species:

- Used as refrigerant, demulcent, diuretic, aphrodisiac, antispasmodic, antidiarrhoea, galactagogue and in rheumatism.
- Tender shoots tonic preferred mainly to convalescing patients and post-natal mother.

Informal/Traditional rules for conservation:

- N/A

Major problem in cultivation, collection/harvest:

- Overharvesting

Other information:

- Collected by village people also.

References:

NTNC-CODEFUND. (2016). Annapurna Conservation Area Management Plan (2016 to 2020) Final Draft. National Trust for Nature Conservation.

Dutta, I.C. (2007*). Non Timber Forest Products of Nepal: Identification, Classification, Ethnic Uses and Cultivation.* HillSide Press(P) Ltd.

IUCN Nepal. (2004). National Register of Medicinal Plants. Kathmandu: IUCN Nepal.

9. *Daphne bholua* Buch.-Ham. ex D.Don

Family: Thymelaeaceae

Nepali name (s): Lokta, Kagat pate

Local name (s): Syu, Rongbu, Baruwa

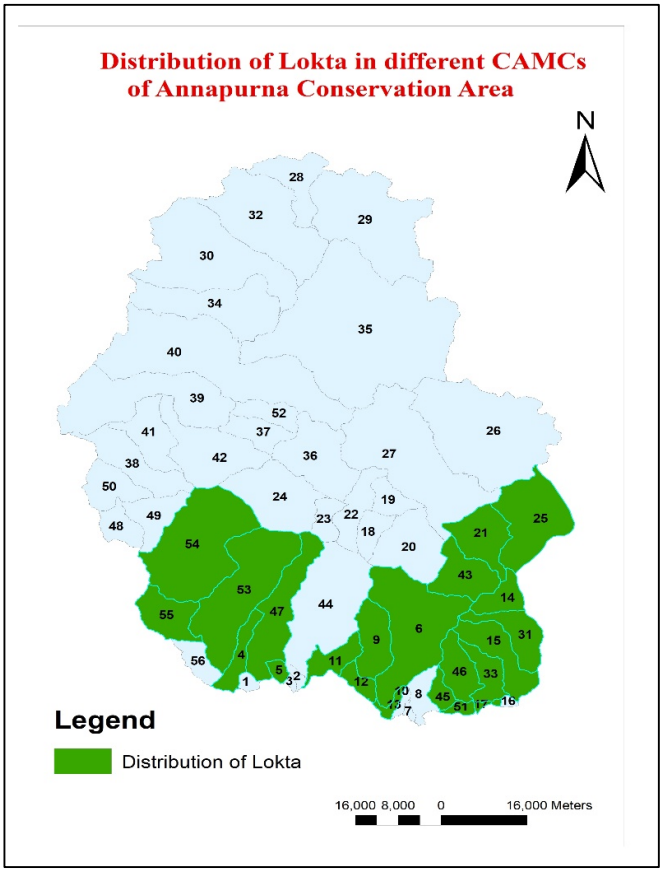
Common name (s): Nepali paper plant

Description: The shrub stands between 1 to 3 meters tall, characterized by elliptic to oblanceolate leaves densely clustered at the tips of its branches. Its delicate pinkish-white flowers bloom in clusters of 5 to 15 at the terminal ends of the branches.

Ecology: These shrubs thrive in the understory of temperate and sub-alpine forests, particularly flourishing in the moist coniferous and broad-leaved forests of the temperate Himalayas.

Conservation and legal status
IUCN: N/A
GoN: N/A
CITES: N/A

Distribution
Nepal: WCE; 1600-2500m
ACA: Bhoje, Bhujung, Chame, Dharapani, Ghandruk, Ghanpokhara, Ghara, Khudi, Lumle, Lwang-Ghalel, Namarjung, Narchang, Parche, Pasgaun, Rivan, Sardikhola, Shikha, Sildujure, Tachain Bagarchhap, Taghring, Thonche, Thumaakodanda and Uttarkanya CAMCs



Availability in ACA

Attributes	Amount
Area (ha)	40707.61
Quantity (Kg/ha)	27.44

Current harvest, process and storage methods

Harvest period	End of September or mid-October
Usable organs/parts	Bark, Root, Stem and Seeds
Post-harvest treatment (s)	Bark should be sun-dried for a minimum of one week to reduce the risk of bacterial and fungal infections. High-quality bark comes from plants with straight single stems, apical branching, Low tapering and large diameter, harvested only when mature.
Recommendation	
No. of person involved in collection/sale	N/A

People's knowledge on quantity of the species:

- Well known

Local use of the species:

- Lokta is utilized as fodder for goats.
- It has been employed for centuries to create various products such as ropes and letters.

Informal/Traditional rules for conservation:

- Harvest the plant at the appropriate time to ensure optimal yield and quality.

Major problem in cultivation, collection/harvest:

- The forest's declining quality stems from slash-and-burn methods, extensive animal grazing and trampling, unsustainable firewood harvesting, and frequent forest fires. Middlemen, motivated by personal gain, push harvesters to overcut Lokta, depleting resources. Inadequate monitoring, lack of collector knowledge, insecure ownership, and rushed product supply contribute to resource exploitation.

Other information:

- Nepali Kagaj, predominantly crafted by local small-scale farmers in remote Nepal districts, is ordered by traders in Kathmandu. These traders use paper as raw material to produce various items, exporting them globally, with some products also available locally. Nepali Kagaj serves as the base material for a wide array of goods, including books, letters, documents, ritual items, artworks, and household items like lampshades and envelopes.

References:

NTNC-CODEFUND. (2016). Annapurna Conservation Area Management Plan (2016 to 2020) Final Draft. National Trust for Nature Conservations.

Dutta, I.C. (2007*). Non Timber Forest Products of Nepal: Identification, Classification, Ethnic Uses and Cultivation.* HillSide Press(P) Ltd.

10. *Urtica dioica* L.

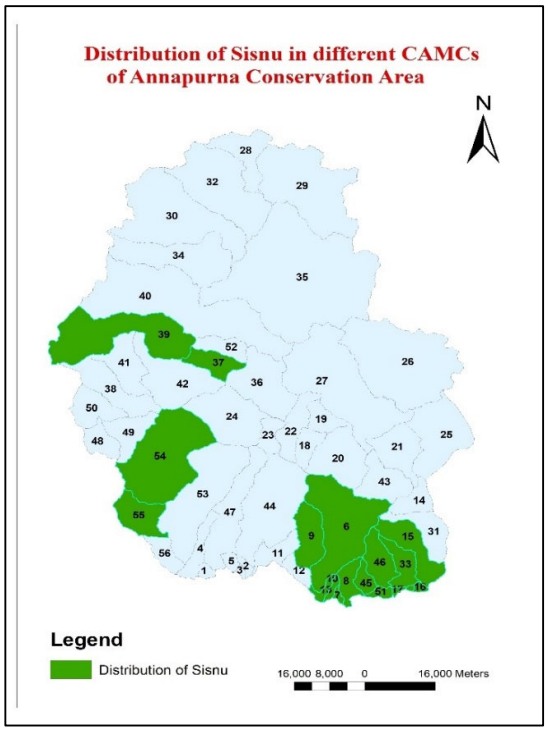
Family: Urticaceae

Nepali name (s): Sisnu

Local name (s): Agni Damani (Sanskrit), Nhaykan (Newari), Polo (Gurung), Sikya (Limbu)

Common name (s): Stinging nettle

Description: It features reddish or yellowish unbranched stems, reaching up to 120 cm in height, with a quadrangular cross-section. Leaves attach to the stem via petioles shorter than half the leaf blade and are accompanied by two pubescent stipules each. The leaves are densely covered on both sides with fine trichomes, comprising shorter simple hairs, longer rigid hairs (known for their stinging sensation), and cystolyths. Inflorescences consist of glomerules grouped on four branched panicles located on axillary verticils, with curved female flowers and patent male flowers. The androecium consists of four elements surrounded by an equal number of hairy tepals, with a vestigial pistil in the center. The gynaecium comprises hairy and sessile pistils covered by two pairs of unequal tepals. Pollen release occurs when the tepals on staminate flowers open, causing inward-curved stamens to elastically spring outwards, dispersing pollen into the air, typically facilitated by wind for pollination. Fruits, known as diclesia, develop post-pollination, containing a single seed that entirely fills the fruit, exhibiting an elliptic shape and brown or olive coloration with lighter spots.



Ecology: It is found in temperate regions of Europe, Asia, North Africa and North America up to 1800 m of altitude. It grows on damp soils, meadows, and abandoned fields in dappled shaded

Conservation and legal status
IUCN: Least concern
GoN: N/A
CITES: N/A

Distribution
Nepal: WCE; 500-4500 m
ACA: Bhachok, Bhoje, Bhujung, Ghandruk, Ghanpokhara, Ghara, Kagbeni, Khudi, Mijuredanda, Muktinath, Namarjung, Narchang, Parche, Pasgaun, Saimarang, Shikha Simpani, Thumaakodanda and Uttarkanya CAMCs

Availability in ACA

Attributes	Amount
Area (ha)	21720.1
Quantity (kg/ha)	31.78

Current harvest, process and storage methods

Harvest period	Year round
Usable organs/parts	All parts
Post-harvest treatment (s)	Sun-dry
Recommendation	Eat young shoots and leaves before plant bears flowers and fruits
No. of person involved in collection/sale	Economically deprived people

People's knowledge on quantity of the species:

- Well known

Local use of the species:

- Young shoots serve as an ingredient in nettle beer production.
- Dried young shoots are preserved for consumption.
- Leaves are applied to control uterine bleeding.
- Root decoctions are utilized in treating wounds caused by dog bites.

Informal/Traditional rules for conservation:

- N/A

Major problem in cultivation, collection/harvest:

- N/A

Other information:

- Soup made from it is useful for diabetes patients.

References:

Grauso, L., de Falco, B., Lanzotti, V., & Motti, R. (2020). Stinging nettle, Urtica dioica L.: botanical, phytochemical and pharmacological overview. *Phytochemistry Reviews*. Advance online publication. https://doi.org/10.1007/s11101-020-09680-x

NTNC-CODEFUND. (2016). Annapurna Conservation Area Management Plan (2016 to 2020) Final Draft. National Trust for Nature Conservations.

11. *Zanthoxylum armatum DC.*

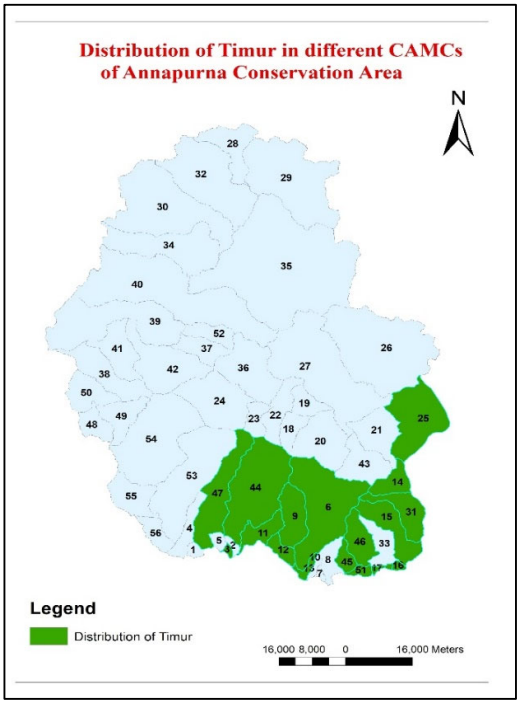
Family: Rutaceae

Nepali name (s): Timur, Nange timur

Local name (s): Prumo (Gurung, Tamang), Sungrukung, Timbur (Lepcha), Yerma (Sherpa), Timur (Tharu), Tebu (Rai), Sekkren (Sunwar)

Common name (s): Prickly ash

Description: It is a compact aromatic tree or a tall shrub reaching heights of up to 6 meters. Its branches are smooth, typically adorned with straight or slightly flattened reddish-brown stipular spines. The leaves are imparipinnate, featuring 3 to 5 pairs of leaflets that are elliptic-lanceolate and pointed at the tip, with a rounded or wedge-shaped base, and attached directly to the stem. The leaf margins are usually smooth, each tooth accompanied by a sizable gland. The petiole and rachis between leaflets are often winged and occasionally bear a spine at the attachment point. Inflorescences take the form of terminal panicles on short lateral shoots, with tiny polygamous flowers arranged in short cymes. Male flowers consist of 6 to 8 stamens, with filaments measuring 2 mm, encircling a globular pistillode. Female flowers contain 1 to 3 ovoid-subglobose carpels, each with two ovules attached to the inner angle of the axis. The fruit is a small drupe, reddish in color, ovoid, and adorned with glandular warts, splitting into two when ripe. Within the fruit lies a single round, glossy black seed, measuring 2 to 3 mm in diameter.



Ecology: It thrives in various habitats, including open pastures, wastelands, and secondary scrub forests, particularly in regions with sufficient rainfall. It prefers moist areas with deep, sun-exposed soils and degraded slopes, as well as shrub lands, natural forests, and wastelands. When cultivating this species, it is ideal to use clay or loam soil with high organic content.

Conservation and legal status

IUCN: LC

GoN: N/A

CITES: N/A

Distribution

Nepal: WCE; 1000-2500m

ACA: Bhoje, Bhujung, Chame, Dharapani, Ghachok, Ghanapokhara, Ghara, Khudi, Lahachok, Lwang-Ghalel, Machhapuchhre, Namarjung, Parche, Pasgaun, Sardikhola, Sildujure, Simpani, Taghring, Thonche, Thumaakodanda and Uttarkanya CAMCs

Availability in ACA

Attributes	Amount
Area (ha)	10650.56
Quantity (Kg/ha)	20.54

Current harvest, process and storage methods

Harvest period	October to January
Usable organs/parts	Fruits and seeds
Post-harvest treatment (s)	Dry fruits in shade
Recommendation	The fruits are segmented before drying and seed extraction. Well-dried seeds are storageareas. Harvesting involves handpicking, sometimes requiring forceps due to the presence of thorns.
No. of person involved in collection/sale	Any people can collect

People's knowledge on quantity of the species:

- Knowledgeable

Local use of the species:

- Fruit decoction and berries are used for abdominal pain, carminative, antispasmodic, rheumatism, skin diseases, cholera, diabetes and asthma.
- Fresh fruits are used as spices and also for making pickles.

Informal/Traditional rules for conservation:

- N/A

Major problem in cultivation, collection/harvest:

- Cultivation poses no issues, and individuals can gather the plant during its fruiting season.

Other information:

- The cultivation of this crop can be initiated either by establishing a nursery or by directly sowing seeds in the primary field. Additionally, certain species of Lepidoptera larvae, such as the Engrailed moth, utilize these plants as food sources.

References:

Phuyal, N., Jha, P. K., Prasad Raturi, P., & Rajbhandary, S. (2018). Zanthoxylum armatum DC.: Current knowledge, gaps and opportunities in Nepal. *Journal of Ethnopharmacology*. https://doi.org/10.1016/j.jep.2018.08.010

NTNC-CODEFUND. (2016). Annapurna Conservation Area Management Plan (2016 to 2020) Final Draft. National Trust for Nature Conservations.

12. *Nardostachys jatamansi* (D.Don) DC.

Family: Caprifoliaceae

Nepali name (s): Jatamasi

Local name (s): Jatamasi, Bhutle

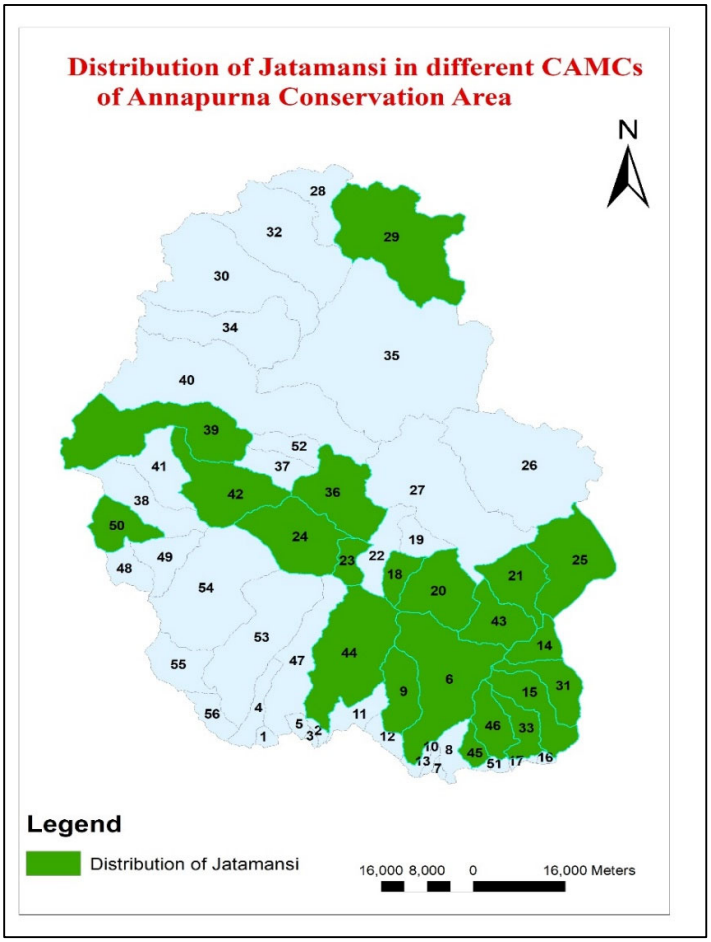
Common name (s): Musk-root, Indian Spikenard, Indian nard

Description: The leaves form dense clusters and exhibit shades of rosy, slightly pink, or blue coloration. The dark grey rhizomes are adorned with reddish-brown tufted fibers, emitting a highly pleasant and aromatic odor. Rhizomes typically range from 2.5 to 7.5 cm in length, featuring an elongated and cylindrical shape.

Ecology: It occurs in alpine zone in steep, moist, rocky, undisturbed grassy slopes of Nepal, China and Bhutan.

Conservation and legal status
IUCN: Critically endangered
GoN: Banned for export outside the country without processing.
CITES: Appendix II

Distribution
Nepal: WC; 3600-5000m
ACA: Bhujung, Chame, Chhoser, Dharapani, Ghanapokhara, Jomsom, Kagbeni, Khudi, Kobang, Khangsar, Machhapuchhre, Manang, Namarjung, Ngawal, Parche, Pasgaun, Pisang, Tachain Bagarchhap, Taghring, Tanki Manang and Thonche CAMCs.



Availability in ACA

Attributes	Amount
Area (ha)	31572.27
Amount (kg/ha)	3.92

Current harvest, process and storage methods

Harvest period	October to November
Usable organs/parts	Rhizomes

Post-harvest treatment (s)	After harvesting rhizome, clean it and sun-dry
Recommendation	Partial harvesting only after maturation. Leave 50% of the plant for regeneration
No. of person involved in collection/sale	N/A

People's knowledge on quantity of the species:

- Due to its occurrence at very high altitudes, many people have not encountered this species and thus lack awareness of its quantity.

Local use of the species:

- Traditionally, it has been employed in treating a wide array of disorders affecting the digestive, circulatory, nervous, respiratory, urinary, reproductive systems, and skin.
- The roots and rhizomes of *Nardostachys jatamansi* are used to address conditions such as hysteria, syncope, epilepsy, and mental weakness, along with cardio protective effects and treatment for neural diseases.
- The essential oil extracted from the roots displays antimicrobial, antifungal, hypotensive, antiarrhythmic, and anticonvulsant properties.

Informal/Traditional rules for conservation:

- Harvest root only after the maturation of the parent plant and not to do complete harvesting.

Major problem in cultivation, collection/harvest:

- Commercial cultivation of this species is hindered by limited knowledge due to its specific preference for very high altitudes, making cultivation difficult. Moreover, its abundance in high-altitude and rugged terrains presents challenges during the harvesting process.

Other information:

- It has very high medicinal value and illegal harvesting should be prohibited to save this vulnerable plant species.

Reference:

Purnima, Bhatt, M., & Kothiyal, P. (2015). A review article on phytochemistry and pharmacological profiles of Nardostachys jatamansi DC-medicinal herb. *Journal of Pharmacognosy and Phytochemistry, 3*(5), 102-106.

Sahu, R., Dhongade, H. J., Pandey, A., Sahu, P., Sahu, V., Patel, D., & Kashyap, P. (2016). Medicinal Properties of Nardostachys jatamansi (A Review). *Oriental Journal of Chemistry, 32*(2), 859-866. DOI: http://dx.doi.org/10.13005/ojc/320211.

13. *Artemisia indica* Willd.

Family: Asteraceae

Nepali name (s): Titepati

Local name (s): Chyangre

Common name (s): Mugwort

Description: Tall herb, lower leaves petioled, uppercones sessile, tifid, flowers in small heads.

Ecology: *Artemisia indica* thrives in a variety of climates, from subtropical regions to alpine zones. It is frequently found along hedge banks and roadsides, particularly in uncultivated and waste areas. This plant adapts well to different soil types, preferring well-drained loamy soil with a neutral to slightly alkaline pH. It favors sunny locations and benefits from consistently moist soil conditions.

Conservation and legal status
IUCN: N/A
GoN: N/A
CITES: N/A

Distribution
Nepal: 300-2500m; WCE
ACA: Bhachok, Bhoje, Bhujung, Ghanapokhara, Khudi, Lahachok, Machhapuchhre, Mijuredanda, Namarjung, Parche, Pasgaun, Rivan, Saimarang, Sardikhola, Sildujure, Simpani, Taghring, Thumaakodanda and Uttarkanya CAMCs

Availability in ACA

Attributes	Amount
Area (ha)	22694.75
Quantity (kg/ha)	112.69

Current harvest, process and storage methods

Harvest period	All year round
Usable organs/parts	Whole plant

Post-harvest treatment (s)	Sun dry
Recommendation	
No. of person involved in collection/sale	

People's knowledge on quantity of the species:

- Well known

Local use of the species:

- Medicine (whole plant), Essential oil (leaves), Incense, Insecticidal (Leaves)

Informal/Traditional rules for conservation:

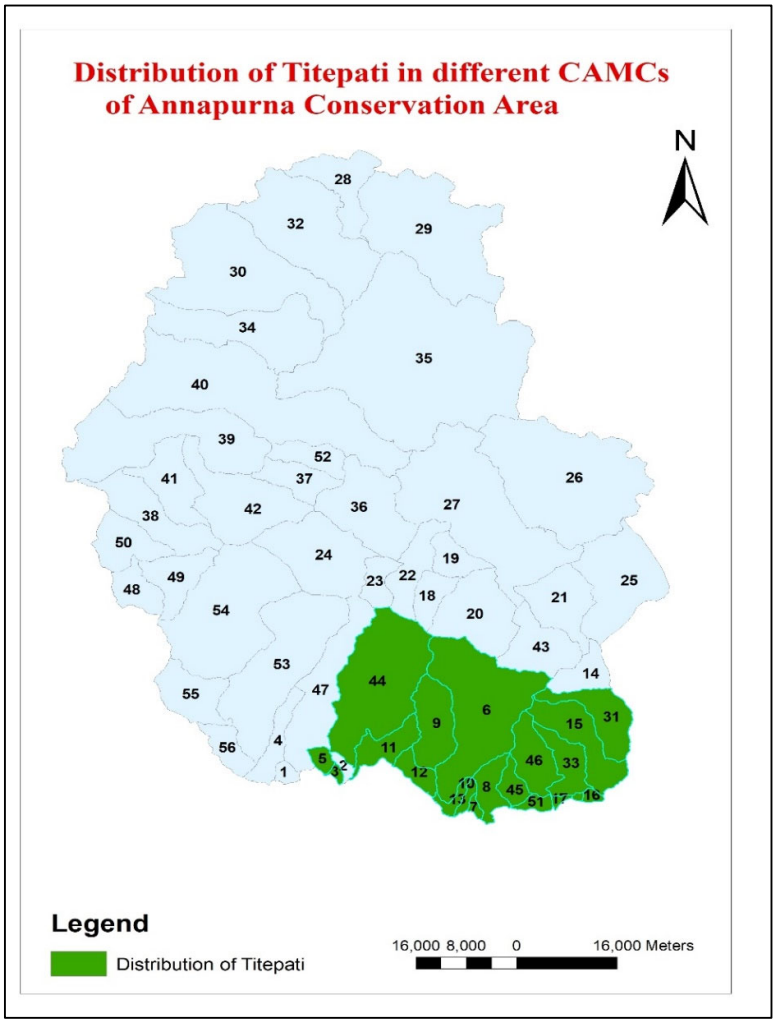
- N/A

Major problem in cultivation, collection/harvest:

- N/A

Other information:

- N/A



References:

NTNC-CODEFUND. (2016). Annapurna Conservation Area Management Plan (2016 to 2020) Final Draft. National Trust for Nature Conservation.

IUCN Nepal. (2004). *National Register Medicinal and Aromatic Plants*. IUCN-The World Conservation Union, Nepal.

14. *Fritillaria cirrhosa* D.Don

Family: Liliaceae

Nepali name: Kakoli

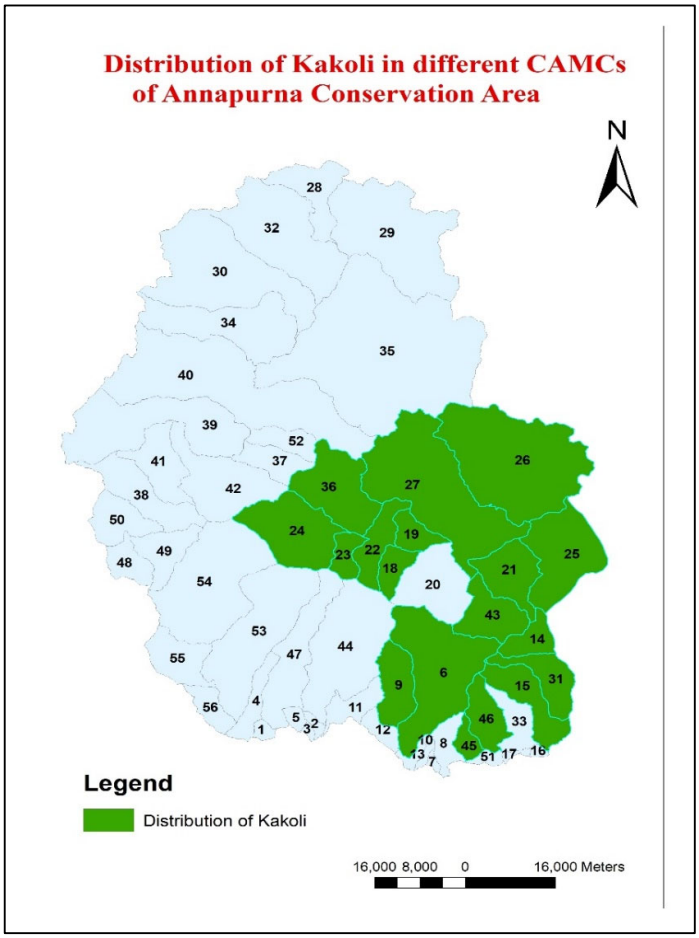
Local name: Ban lasun

Common name: Snakehead Fritillary, Himalayan fritillary

Description: Perennial bulbous herbs with subglobose bulbs that have fleshy, whitish scales. The stem is erect, simple, and leafy. The flowers are campanulate and nodding, featuring yellow or yellowish-green tepals that are spotted with purple.

Ecology: It is found in open grassy slopes, moist alpine meadows, and among shrubs, thickets, and forests.

Conservation and legal status:
IUCN: Vulnerable
GON: N/A
CITES: N/A



Distribution:
Nepal: WCE, 3000-4700m
ACA: Bharaka, Bhujung, Chame, Dharapani, Ghyaru, Khangsar, Khudi, Manang, Namarjung, Nar, Ngawal, Parche, Pasgaun, Phoo, Tachain Bagarchhap, Taghring, Tanki Manang and Thonce

Availability in ACA

Availability	Amount
Area (ha)	28411.89
Quantity (kg/ha)	3.098

Current harvest, process and storage methods

Harvest period	July-September
Usable organs/parts	Whole plant

Post-harvest treatment (s)	
Recommendation	Avoid overgrazing and promote sustainable harvesting
No. of person involved in collection/sale	N/A

People's knowledge on quantity of species:

- N/A

Local use of the species:

- Whole plant used as medicine.
- Root and leaves used as food.
- Used to treat cough and asthma, the bulbs can help clear phlegm from the lungs and reduce heat.
- Bulbs are utilized for treating respiratory and gastrointestinal disorders and are consumed raw or roasted as a general tonic. Additionally, bulbs are administered to livestock as an antidote for aconite or other poisonings.

Informal/tradtional rules for conservation:

- N/A

Major problem in cultivation, collection/harvest:

- N/A

Other information

- Sustainable harvesting and control trade rate.

References:

Ghimire, S. K., Subedi, C. K., Budha-Magar, S., Adhikari, M., Pandey, T. R., Awasthi, B., Thapa Magar, S., Paudeyal, M. R., Ghimire, K. M., Shrestha, B. B., Bhatt, G. D., Joshi, L. R., Paudel, A., Chapagain, D. J., & Gurung, J. (2021). *Flora of Kailash Sacred Landscape Nepal: An annotated checklist. Volume 1 (Gymnosperms and Angiosperms: Ephedraceae – Buxaceae).* Research Centre for Applied Science and Technology (RECAST), Tribhuvan University.

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15. *Juniperus indica* Bertol.

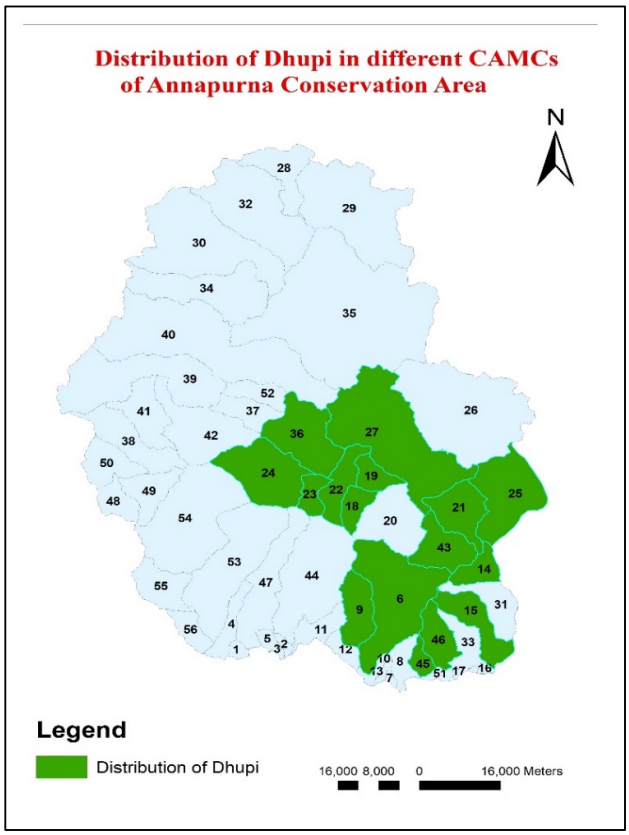
Family: Cupressaceae

Nepali name (s): Kalo dhupi, Pamu

Local name (s): Dhupi

Common name (s): Black Juniper, Wallich's Juniper

Description: The plant is a small tree or woody shrub, typically reaching heights of 0.5-2 m, characterized by predominantly horizontal branching. It exhibits dwarf shrub morphology at higher elevations above 4200 m and transitions into a tree form at lower elevations, ranging from 3300 to 4000 m. Its leaves are dark grey-green and exhibit dimorphism: adult plants primarily feature scale-like leaves arranged in decussate or occasionally whorled patterns, measuring 1-3 mm long, whereas young plants bear primarily needle-like leaves arranged in whorls of 3, measuring 5-8 mm long. Needle-like leaves may also occur on shaded shoots of adult plants. The species is dioecious, with male (pollen) and female (seed) cones produced on separate plants. Pollen cones are sub-globose or ovoid, approximately 2-3 mm long, while seed cones resemble berries, are ovoid in shape, 6-10 mm long, and turn glossy black when ripe, containing a single seed. Cones appear from April to May and mature from October to December. Seed dispersal is predominantly facilitated by birds that consume the cones.



Ecology: The plant is found on open and rocky alpine slopes in drier areas; sometimes forming forests at lower elevation.

Conservation and legal status
IUCN: Least concern
GoN: N/A
CITES: N/A

Distribution
Nepal: WCE; 3600-4800m
ACA: Bharaka, Bhujung, Chame, Dharapani, Ghyaru, Khangsar, Khudi, Manang, Namarjung, Nar, Ngawal, Parche, Pasgaun, Tachain Bagarchhap, Taghring, Tanki Manang and Thonche CAMCs.

Availability in ACA

Attributes	Amount
Area (ha)	19979.87
Quantity (kg/ha)	33.29

Current harvest, process and storage methods

Harvest period	Leaves throughout year and fruits during July-October
Usable organs/parts	Leaves, stem, barks and fruits
Post-harvest treatment (s)	Leaves should be dried after harvesting
Recommendation	Harvest leaves without branch damage or cutting
No. of person involved in collection/sale	Mostly, Buddhist individuals are primarily involved in cutting

People's knowledge on quantity of the species:

- The quantity of the species remains unchanged compared to the past.

Local use of the species:

- Leaves and fruits are used medicinally in kidney, skin and lymph disorders, fever, cough and cold, sores, wounds and paralysis of limbs.
- Used as fencing material and for carving different household articles.
- Dried leaves sold locally for incense.

Informal/Traditional rules for conservation:

- Because of the religious significance attached to this species, excessive harvesting and destruction are considered sinful, which is a significant factor contributing to its conservation.

Major problem in cultivation, collection/harvest:

- The slow growth rate, preference for windy conditions, and need for specific moisture levels make cultivation challenging.

Other information:

- This plant is notable for being the highest elevation woody species.

References:

Chapagain, A., Chaudhary, R. P., & Ghimire, S. K. (2020). Population Structure of Juniperus indica Bertol. along Elevation Gradient in Manang, Trans-Himalayas Nepal. *Journal of Plant Resources, 18*(1), 190-204.

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16. *Polygonatum cirrhifolium (Wall.) Royle*

Synonym: *Convallaria cirrhifolia* Wall.

Family: Asparagaceae

Nepali name: Khiraunla

Local name: Khiraunla

Common name: Solomon's Seal

Description: This tall, erect perennial herb grows to a height of 60 to 120 cm and features whorled (3-6) sessile, linear leaves with tendril-like tips. The flowers are white, greenish-purple, or pink on short stalks, and the fruits are round, black berries. Its rhizomes are thick and fleshy.

Ecology: This species prefers to grow on hill slopes in shaded areas, such as oak-rhododendron forests.

Conservation and legal status:
IUCN: N/A
GON: N/A
CITES: N/A

Distribution:
Nepal: WCE; 1200-4600 m
ACA: Bhujung, Chame, Dharapani, Jhong, Kagbeni, Khudi, Kobang, Kunjo, Lete, Marpha, Muktinath, Namarjung, Parche, Pasgaun, Pisang, Tachain Bagarchhap, Taghring, Thonche and Tukuche

Availability in ACA

Attributes	Amount
Area (ha)	19244.75
Quantity (kg/ha)	4.86

Current harvest and storage methods

Harvest period	July-October
Usable organs/parts	Leaves, Rhizomes and Stem
Post-harvest treatment (s)	
Recommendation	Avoid destructive harvesting
No. of person involved in collection/sale	N/A

People's knowledge on quantity of species:

- N/A

Local use of the species:

- Skin illness, anorexia, fever, sexual debility, wound healer, menstrual problem, bronchitis, tuberculosis, swelling in abdominal region, etc.

Informal/traditional rules for conservation:

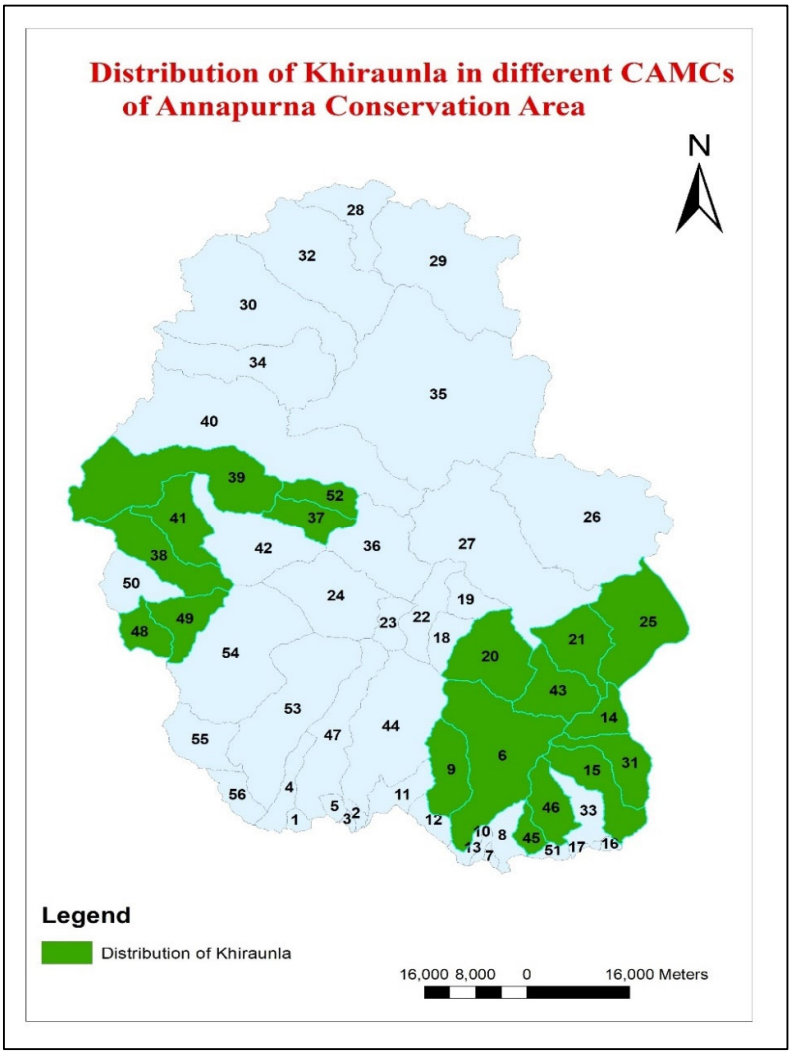
- N/A

Major problem in cultivation, collection/harvest:

- N/A

Other information

- This species requires conservation attention.



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17. *Bergenia ciliata (Haw.) Sternb.*

Family: Saxifragaceae

Nepali name (s): Pakhanbed

Local name (s): Padawa, Pakombet

Common name (s): Rockfoil

Description: It is a perennial herb with thick, stout, creeping rhizomes. leaves variable, 5-35 cm long, coarsely hairy, sparsely hairy to glabrous, broadly ovate to elliptic; finely or sparsely denticulate or shallowly sinuate-dentate; flowers white, pink or purple, in long cymose panicles; capsules round.

Ecology: This species flourishes in Himalayan woodland, rocky ledges, and alpine meadows.
Conservation and legal status

IUCN: Threatened
GoN: N/A
CITES: N/A

Distribution
Nepal: WC; 1600-3200m
ACA: Bhachok, Bhoje, Bhujung, Ghanapokhara, Khudi, Kobang, Kunjo, Lumle, Mijuredanda, Pasgaun, Saimarang, Sildujure, Simpani, Tachain Bagarchhap, Taghring and Uttarkanya CAMCs.

Availability in ACA

Attributes	Amount
Area (ha)	5516.29
Quantity (kg/ha)	12.09

Current harvest, process and storage methods

Harvest period	July-September
Usable organs/parts	Rhizome, Leaves, Seeds and Flower
Post-harvest treatment (s)	Sun-dry
Recommendation	Partial harvest after maturation

No. of person involved in collection/sale

People's knowledge on quantity of the species:

- well known knowledge

Local use of the species:

- Helpful in dissolving kidney stones
- Decoction of root is used as an anti-diarrheal.
- Juice from the rhizome is taken to get relief from fever.

Informal/Traditional rules for conservation:

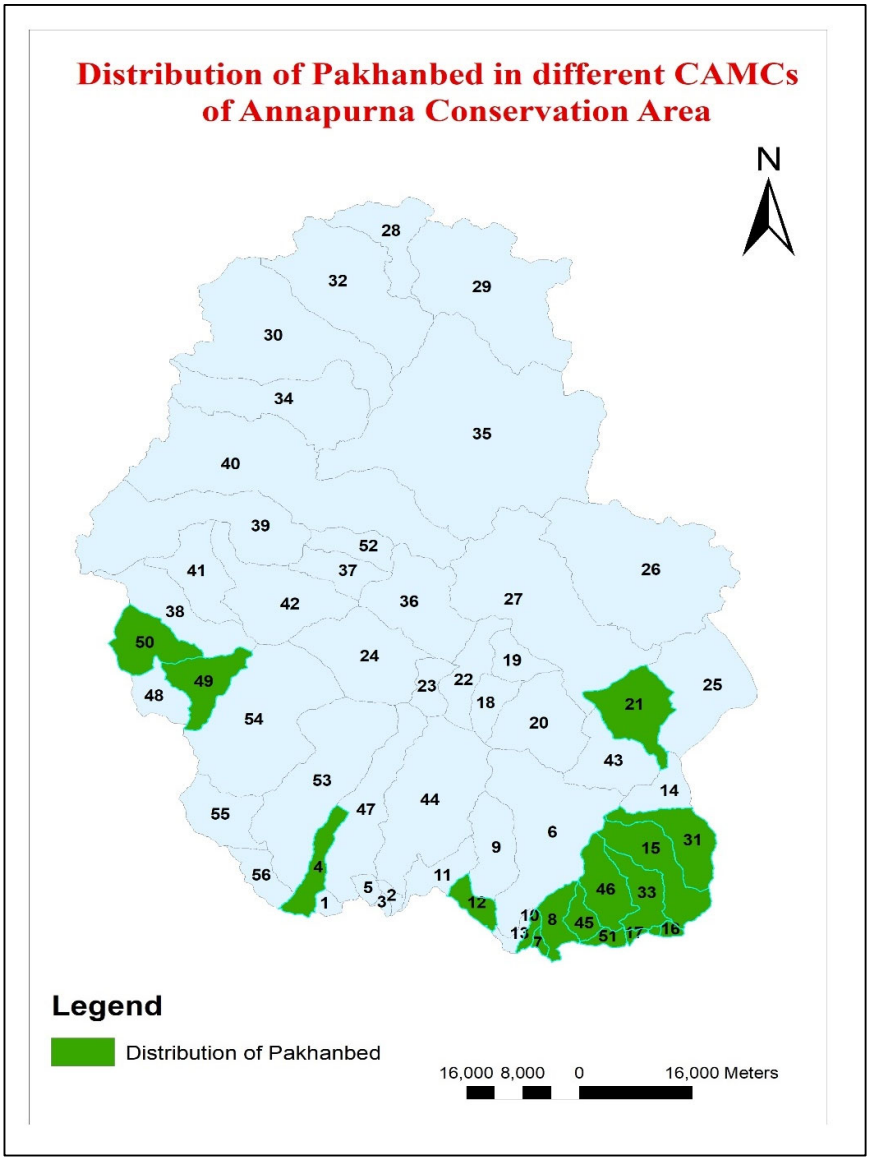
- N/A

Major problem in cultivation, collection/harvest:

- N/A

Other information:

- N/A



18. *Morella esculenta* (Buch.-Ham. ex D.Don) I.M.Turner

Synonym: *Myrica esculenta* Buch.-Ham. ex D.Don

Family: Myricaceae

Nepali name (s): Kaphal

Local name (s): Kaphal

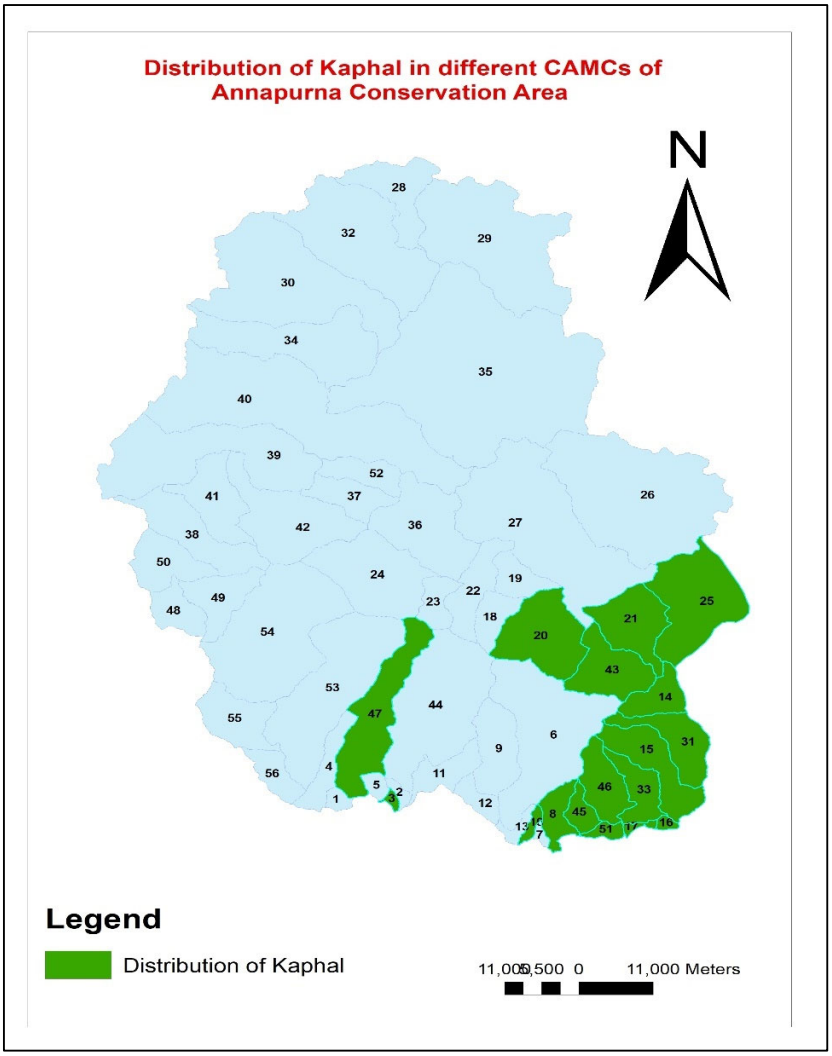
Common name (s): Box myrtle, Bayberry

Description: It is a medium to large woody tree, reaching heights of about 12-15 m with a trunk diameter of approximately 92.5 cm. The outer bark appears greyish-dark and rough, with vertical wrinkles, while the inner bark is dark brown and smooth, with a hard texture, bitter taste, and nauseating odor. The lanceolate leaves have entire or serrate margins, pale green on the lower surface and dark green on the upper surface, measuring approximately 9-12 cm in length and 3-3.5 cm in width, often clustered towards branch ends. Pistillate flowers are small, sessile, solitary, and bracteates, with inconspicuous sepals and petals. The inflorescence, or catkin, is 4.2 cm long, axillary, bearing around 25 flowers in a thread-like style. Staminate flower inflorescence is a compound raceme. Flowering typically occurs from February to the second week of April, with the peak in the first week of March, while fruiting occurs from the first week of May to the end of May. The tree produces drupe fruits, red to dark brown, ellipsoidal or oval, measuring about 2-7 mm in diameter, with a sweet and sour taste. The fruits contain smooth-surfaced, light brown-colored seeds, approximately 1-6 mm in diameter, with an oily taste.

Ecology: In the Western Himalaya, *Morchella esculenta* predominantly *inhabits Pinus roxburghii, Quercus leucotrichophora*, and mixed oak forests, favoring open, mixed forests situated on mountain slopes within temperate and subtropical zones.

Conservation and legal status:
IUCN: N/A
GoN: N/A
CITES: N/A

Distribution:
Nepal: WCE; 900-2100m
ACA: Bhujung, Pasgaun, Bhoje, Uttarkanya, Ghanapokhara, Taghring, Simpani, Dhampus, Lwang, Rivan, Ghachok, Lahchok, Machhapuchhre, Sardikhola, Dansing and Ghara CAMCs



Availability in ACA

Attributes	Amount
Area (ha)	9873.55
Quantity (Kg/ha)	11.422

Current harvest, process and storage methods

Harvest period	April-June
Usable organs/parts	Fruits
Post-harvest treatment	After collection of fruits, they are freshly sold as they are perishable in nature
Recommendation	Should be eaten or sold as quick as possible as they don't exceed 2-3 days
No. of person involved in collection/sale	N/A

People's knowledge on quantity of the species:

- While people generally have knowledge about the availability and distribution of the species, they remain unaware of its specific quantity.

Local use of the species:

- Most preferred and tastier fruits in Himalayas and thus used in preparation of jams, syrups, refreshing drinks and pickles.
- It is actinorhizal so useful in regeneration depleted soils.
- Tree used for timber, fuel, fodder, wood as well as for tanning and obtaining yellow colored dye.

Informal/Traditional rules for conservation:

- Leave some fruits in tree for future generation.

Major problem in cultivation, collection/harvest:

- Cultivation is limited and overexploitation from wild sources by indigenous people lead the species in verge of extinction.
- Poor regeneration in natural habitat due to increase in urbanization, unsustainable harvesting and conversion of forest and waste land for commercial purposes.

Other information:

- *Myrica esculenta* has shown pharmacological effects in treating various diseases such as asthma, diabetes, tumors, ulcers, and tension. However, due to its abundance in vitamin C and polyphenolic compounds, further exploration is needed to understand its potential in immunomodulatory, cardioprotective, nephroprotective, and neuroprotective activities.

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19. *Allium wallichii* Kunth

Family: Amaryllidaceae

Nepali name (s): Ban Lasun, Jimbu jhar

Local name (s): Ban Lasun

Common name (s): Himalayan onion

Description: The roots are thick and long. The bulb can be single or clustered, cylindrical, with a brownish-yellow outer layer. Leaves are narrow to broad, usually shorter than the stem, with a clear central vein and a base that doesn't narrow into a petiole. The stem is often triangular, sometimes with narrow wings, and has leaf sheaths only at the base. The protective spathe usually has one or two parts and falls off after harvesting. The flower cluster is typically round and may vary in density. Flower stalks are usually two to four times longer than the perianth, without bracts. The perianth segments spread out and then curve back after flowering, in colors ranging from red to purple. Filaments are slender, attached to perianth segments, and shorter or equal in length. The ovary is smooth and oval-shaped, with two ovules per chamber. The style is longer than the ovary.**Ecology:** Forest margins, scrub, moist meadows, stream banks

Conservation and legal status:
IUCN: N/A
GoN: N/A
CITES: N/A

Distribution:
Nepal: CE, 2300-4800 m
ACA: Chhonhup, Chhoser, Ghami, Jhong, Jomsom, Kagbeni, Kobang, Kunjo, Lete, Marpha, Muktinath, Parche, Surkhang, T-sarang and Tukuche CAMCs

Availability in ACA:

Attributes	Amount
Area (ha)	19418.78
Quantity (kg/ha)	0.68

Existing harvesting, storage and processing method:

Flowering period	June-September

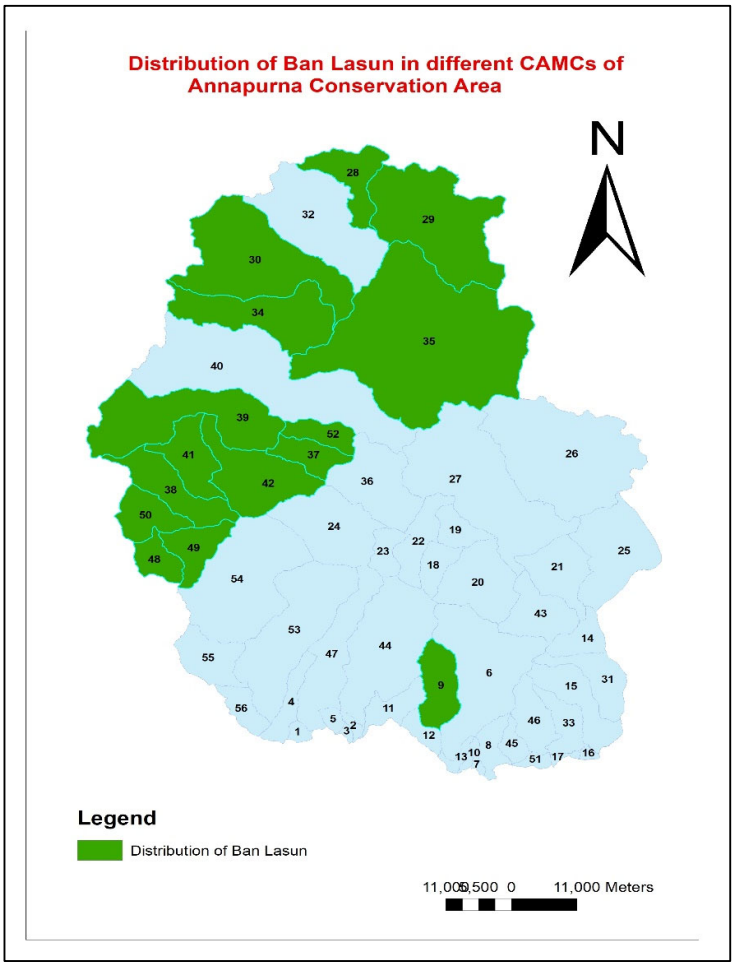
Fruiting period	August-October
Usable organs/parts	Root bulbs
Post-harvest treatment (s)	Cleaning, sorting, sun-dry and store in dry places
Recommendation	N/A
No. of person involved in collection/sale	

People's knowledge on quantity of the species:

- N/A

Local use of the species:

- The bulb is used for treating asthma, bronchitis, and bleeding during cough, particularly in tuberculosis. Its paste stops bleeding from wounds and treats pimples. Internally, it helps with coughs, bronchitis, pneumonia, asthma, feverish illnesses, and abscesses.



Informal/Traditional rules for conservation:

- N/A

Major problem in cultivation, collection/harvest:

- This plant typically thrives in high-altitude and steep terrain, making its harvesting process exceedingly challenging.

Other information:

- N/A

References:

NTNC-CODEFUND. (2016). Annapurna Conservation Area Management Plan (2016 to 2020) Final Draft. National Trust for Nature Conservation.

20. *Hippophae tibetana* Schltdl.

Family: Elaeagnaceae

Nepali name: Bhuin chuk

Local name: Bhuin chuk, Chichi, Trichhyu, Tara

chuk

Common name: Seabuckthorn

Description: A small shrub, standing 10-60 cm tall, features densely scaly, oblong leaves. Its flowers appear in small catkins, while the female flowers form in small racemes.

Ecology: It occurs in alpine and tran-himalayan zone.

Conservation and legal status:
IUCN: N/A
GON: N/A
CITES: N/A

Distribution:
Nepal: WCE; 33300-4500 m
ACA: Bharaka, Chhonhup, Chhoser, Chhusang, Ghami, Jhong, Jomsom, Kagbeni, Lomanthang, Manang, Muktinath, Ngawal, Surkhang, Tanki-Manang and T-sarang

Attributes	Amount
Area (ha)	18338.1
Quantity (kg/ha)	2.632

Availability in ACA

Current harvest, process and storage methods

Flowering period	May-June
Fruiting period	June-August
Usable organs/parts	Fruits
Post-harvest treatment (s)	Cleaning and grinding
Recommendation	
No. of person involved in collection/sale	N/A

People's knowledge on quantity of species:

- N/A

Local use of the species:

- It is utilized in the production of juice, sweet wine, medium dry wine, carbonated wine, champagne, and beer.
- It is also incorporated into jam, chocolate, shampoo, cosmetics, and used as an expecBhuin chuknt.
- Ripe fruits are consumed raw.

Informal/tradtional rules for conservation:

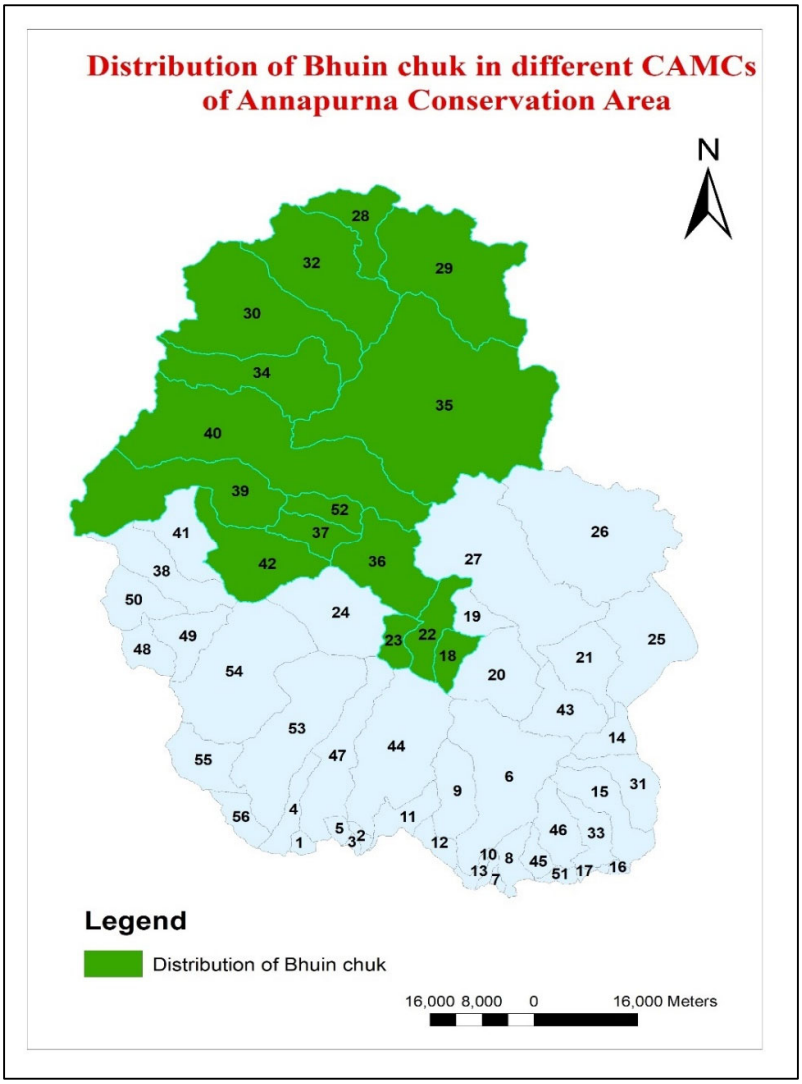
- N/A

Major problem in cultivation, collection/harvest:

- N/A

Other information

- N/A



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IUCN Nepal. (2004). *National Register of Medicinal and Aromatic Plants (Revised and updated)*. IUCN-The World Conservation Union, Nepal.

21. *Aconitum lethale* Griff.

Synonym: ***Aconitum spicatum* (Brühl) Stapf**

Family: Ranunculaceae

Nepali name(s): Bikh

Common name(s): Aconite, Nepali Aconite

Local name(s): Not specified

Description:

Roots: Aconitum spicatum has biennial tuberous roots, typically paired and around 10 cm long. These roots are usually brown or blackish in color and have a slightly sweetish bitter taste followed by tingling sensations.

Leaves: The leaves of Aconitum spicatum are orbicular-cordate (heart-shaped with rounded lobes) and palmately lobed (having lobes radiating from a common point, like fingers on a hand).

Flowers: The flowers of Aconitum spicatum grow in racemes, which are elongated clusters of flowers along a central stem. The reproductive structures include five oblong follicles containing obpyramidal seeds with a winged raphe and undulate hyaline lamellae.

Ecology: Aconitum spicatum is typically found in alpine shrubberies and on open slopes. These habitats are characteristic of mountainous regions with cool climates and well-drained soils.

Distribution:

Nepal: WCE, 1800-4800 m

ACA: Bhujung, Chame, Dharapani, Ghandruk, Ghanapokhara, Khudi, Namarjung, Parche, Pasgaun, Pisang, Shikha and Taghring CAMC

Availability in ACA:

Attributes	Amount
Area (ha)	11855.67
Quantity (kg/ha)	2.29

Current harvest, process and storage methods:

Harvest period	October-November
Usable organs/parts	Rhizome
Post-harvest treatment (s)	Sun-dry
Recommendation	Harvest after maturation

People's knowledge on quantity of the species:

- Well known

Local use of the species:

- Roots are utilized for treating nervous system, digestive system, rheumatism, and fever ailments.

Informal/Traditional rules for conservation:

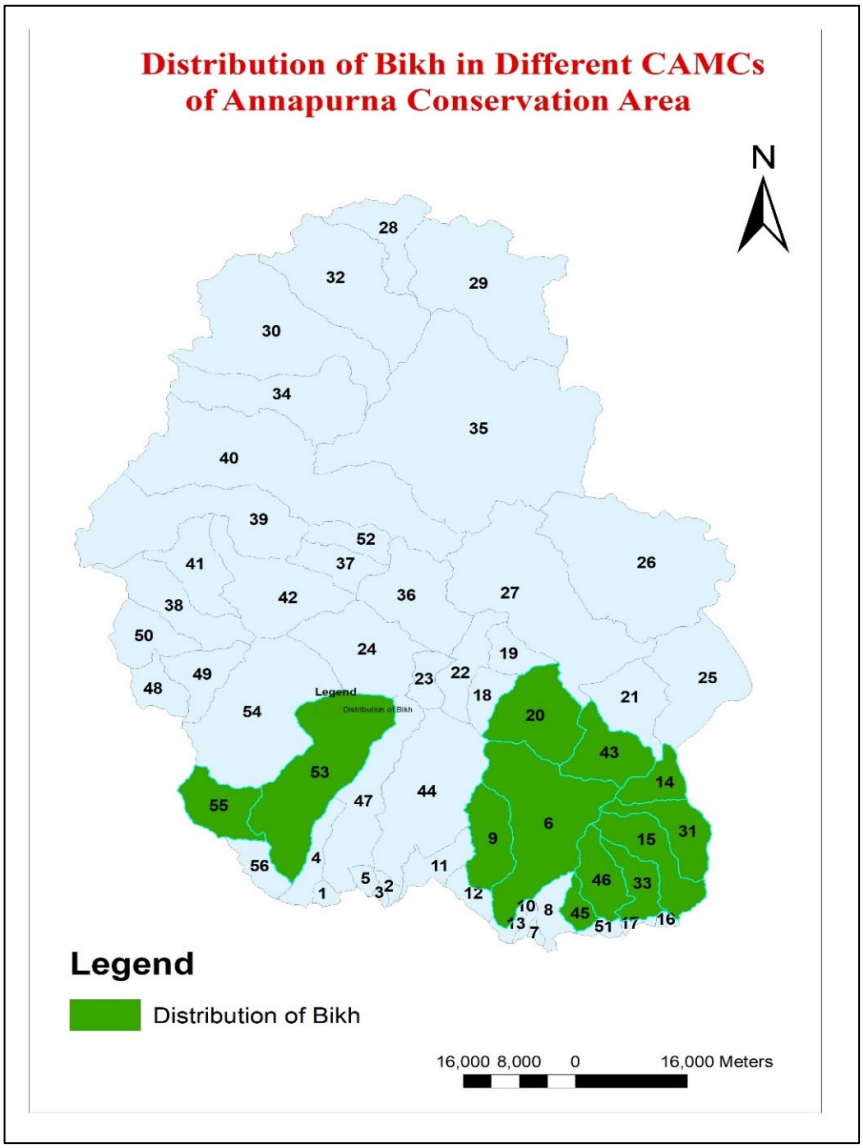
- N/A

Major problem in cultivation, collection/harvest:

- N/A

Other information:

- N/A



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22. *Dioscorea hamiltonii* Hook.f.

Family: Dioscoreaceae

Nepali name: Ban-tarul

Local name: Ban-tarul

Common name: Mountain Yam, Yam

Description: This rare plant primarily grows in the interior evergreen and moist deciduous forests of the Himalayas, from Nepal to Bhutan, as well as in Assam, Northeast India, Burma, and Indochina. The plant is characterized by its tuberous nature and climbing habit. Its leaves are ovate or lanceolate, measuring 4-8 x 2-5 cm, with a truncate to deeply cordate, arrow-shaped base. The male spikes are found either solitary or in clusters of up to four, often with axillary bracts, and it produces capsular reniform fruits.

Ecology: This plant is found growing wild in mixed forests, scrub forests, mountain slopes, valleys, and along roadsides at elevations ranging from 100 to 2000 meters. It flourishes in hot, humid, or moderate climates with average temperatures between 20-30 °C and annual rainfall exceeding 2000 mm. The plant thrives in midland and plains regions of the mountains. It is hygrophilous, shade-tolerant, and prefers fertile, well-drained sandy loam soils, but it does not tolerate waterlogged conditions.

Conservation and legal status:
IUCN: Near Threatened
GON: N/A
CITES: N/A

Distribution
Nepal:
ACA: Bhachok, Ghanapokhara, Khudi, Mijuredanda, Pasgaun, Saimarang, Sildujure, Taghring, Thumaakodanda and Uttarkanya CAMCs

Availability in ACA

Attributes	Amount
Area (ha)	5214.18
Quantity (kg/ha)	78.7

Current harvest, process and storage methods

Harvest period	
Usable organs/parts	Tuber
Post-harvest treatment (s)	Boiled, Roasted and Eaten
Recommendation	
No. of person involved in collection/sale	N/A

People's knowledge on quantity of species:

- N/A

Local use of the species:

- Useful for gastro-intestinal disorder.
- Tuber is taken as food after boiling.

Informal/traditional rules for conservation:

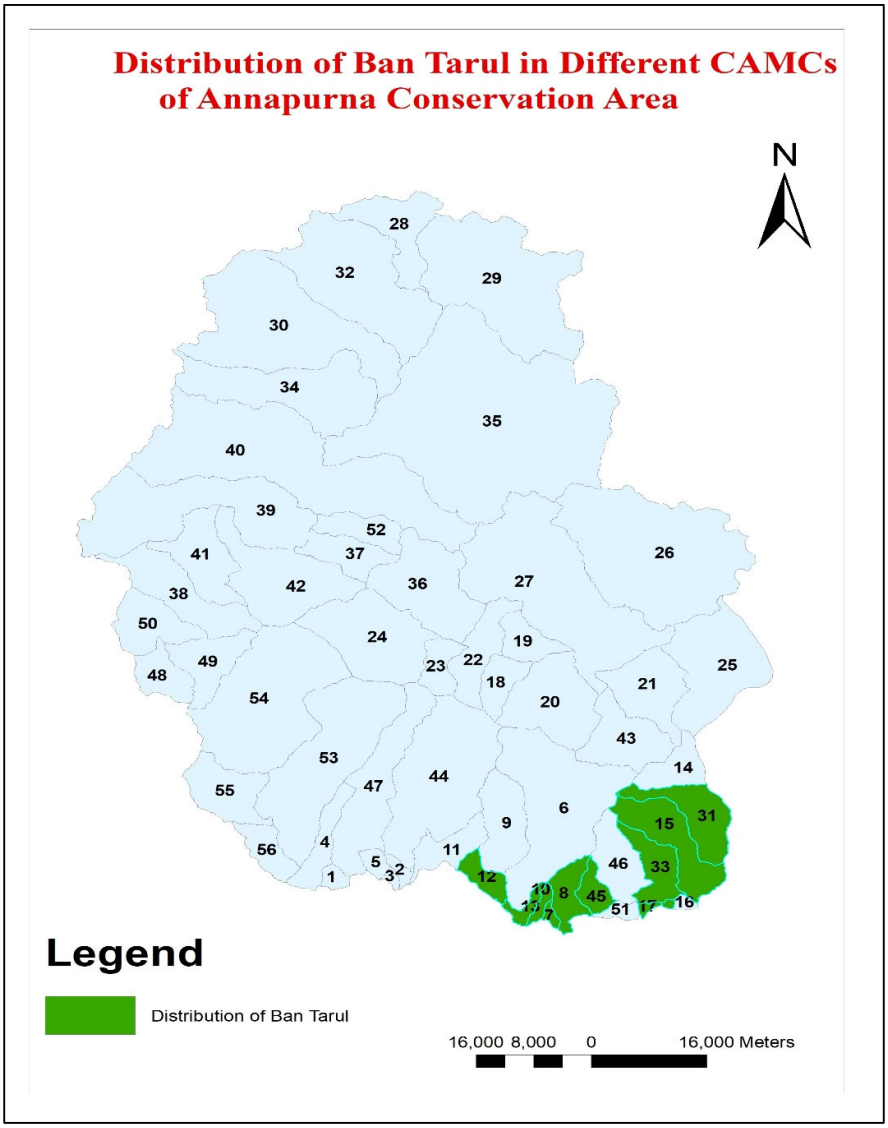
- N/A

Major problem in cultivation, collection/harvest:

- N/A

Other information

- N/A



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23. *Prinsepia utilis* Royle

Family: Rosaceae

Nepali name: Dhatelo

Local name:

Common name: Himalayan Cherry

Description: It is a thorny shrub that can reach a height of up to 3 meters. The thickets of this plant have an average circumference of 4–6 meters and exhibit extensive branching above the ground. The bark is rough, pinkish, or gray, and exfoliates in thin, papery strips. The stem, which is green and 6 cm in diameter, is armed with stout prickles. The leaves are elliptical or lanceolate, up to 12.5 cm long, and the flowers are white to yellowish.

Ecology: The species is native of tropical and temperate Asia, its natural stands are found on the slope, outside forest habitats varying from sheer rocky cliffs in the mountains to gentle, almost level ground in the valleys. The soils vary from red to black where it grows and is well-drained. It can be easily cultivated through seeds.

Conservation and legal status:
IUCN: N/A
GON: N/A
CITES: N/A

Distribution:
Nepal: WCE, 1100-3400m
ACA: Bhujung, Dharapani, Khudi, Mijuredanda, Namarjung, Parche, Sildujure, Simpani, Tachain Bagarchhap, Taghring, Thonche and Thumaakodanda

Availability in ACA

Attributes	Amount
Area (ha)	6734.33
Quantity (kg/ha)	17.62

Current harvest, process and storage methods

Harvest period	
Usable organs/parts	Roots, seeds and fruits
Post-harvest treatment (s)	

Recommendation
No. of person involved in collection/sale

People's knowledge on quantity of species:

- N/A

Local use of the species:

- Used for the treatment of skin disease, diarrhea, stomach ache, etc.

Informal/traditional rules for conservation:

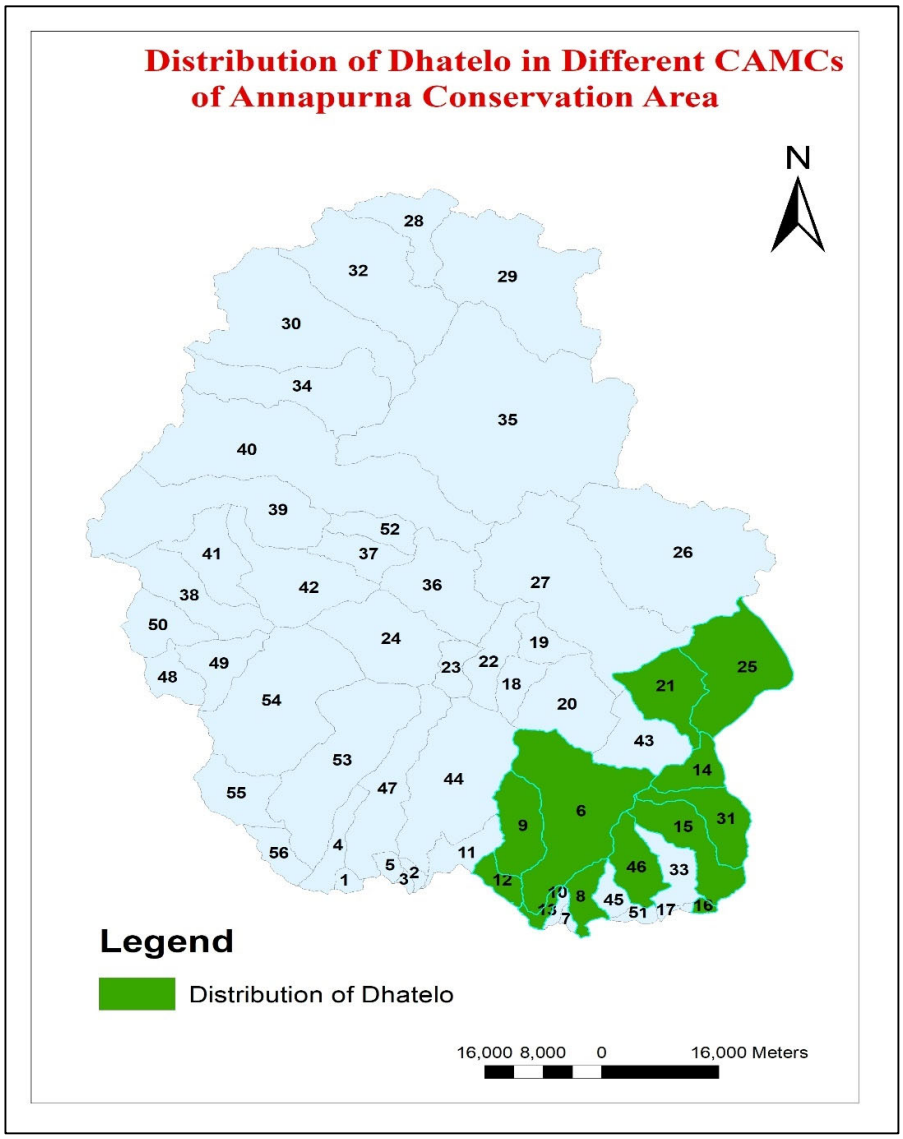
- N/A

Major problem in cultivation, collection/harvest:

- N/A

Other information

- N/A



References:

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24. *Rubia manjith* Roxb.

Family: Rubiaceae

Nepali name: Majitho

Local name: Kat (Rai), Tiru (Tamang), Gur (Takuram)

Common name: Indian madder

Description: is a perennial climbing plant characterized by its prickly stem, which can grow up to 12 meters in length. The leaves are highly variable, typically ovate-lanceolate with 5-7 veins, measuring 2-10 cm in length and 2-5 cm in width. They are arranged in whorls of 4-6 along the stem. The flowers, which bloom from August to October, are small and fragrant, ranging in color from whitish to greenish-yellow. The fruit is also small, glabrous, and typically contains 1-2 seeds. When mature, the fruit appears dark purplish or blackish. The roots of Rubia manjith are perennial, long, cylindrical, and have a rusty brown coloration. This plant is valued for its medicinal properties and is used in traditional medicine systems.

Ecology: It occurs in sub-tropical to temperate zones.

Conservation and legal status:
IUCN: N/A
GON: N/A
CITES: N/A

Distribution:
Nepal: CE; 1100-3200m
ACA: Bhoje, Bhujung, Ghanapokhara, Khudi, Namarjung, Parche, Pasgaun, Sildujure, Simpani, Taghring, Thumaakodanda and Uttarkanya CAMCs

Availability in ACA

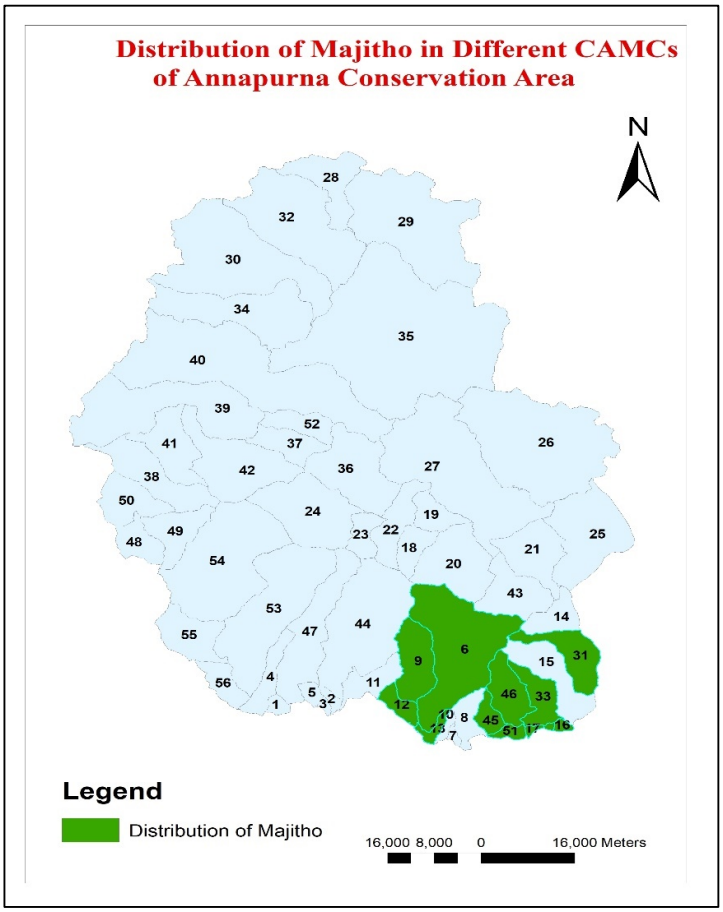
Attributes	Amount
Area (ha)	5286.88
Quantity (kg/ha)	30.7425

Current harvest, process and storage methods

Fruiting period	November-December
Flowering period	July-October
Usable organs/parts	Whole plant
Post-harvest treatment (s)	Sun-dry
Recommendation	
No. of person involved in collection/sale	N/A

People's knowledge on quantity of species:

- N/A



Local use of the species:

- The root is utilized in treating various conditions including cough, uterine and vaginal ailments, eye and ear afflictions, leukoderma, erysipelas, jaundice, and piles.
- Roots are employed for coloring medicinal oils.
- Decoctions of leaves and stems are administered as vermifuges.
- Leaves are used to enhance appetite and alleviate biliousness.
- The stem finds application in treating snake bites and scorpion stings.
- Fruits are topically applied for addressing paralysis, ulcers, and skin conditions.

Informal/traditional rules for conservation:

- N/A

Major problem in cultivation, collection/harvest:

- N/A

Other information

- N/A

Reference:

Dutta, I.C. (2007*). Non Timber Forest Products of Nepal: Identification, Classification, Ethnic Uses and Cultivation.* HillSide Press(P) Ltd.

25. *Cinnamomum tamala* (Buch.-Ham.) T.Nees & Eberm.

Family: Lauraceae

Nepali name (s): Tejpat, Dalchini, Sinkauli

Local name (s): Singwa, Dalchini

Common name (s): Cinnamon

Description: It is a moderate-sized evergreen tree ranging from 2 to 10 meters in height. Its leaves are arranged in a stacked, opposite, or sub-opposite manner, characterized by their elliptic-oblong shape, shining surface, leathery texture, and complete absence of serrations. These leaves possess prominent veins originating from the base and culminate in a long, pointed apex. When young, the leaves exhibit a subtle pinkish hue. The tree's flowers are small and yellowish, typically blossoming between the months of March to May.

Ecology: Sub-tropical zone to temperate zone

Conservation and legal status
IUCN: Least concern
GoN: N/A
CITES: N/A

Distribution
Nepal: WCE, 450-2000m
ACA: Bhachok, Bhoje, Bhujung, Ghanapokhara, Khudi, Mijuredanda, Pasgaun, Saimarang, Sildujure, Simpani, Taghring and Uttarkanya CAMCs.

Availability in ACA

Attributes	Amount
Area (ha)	5813.61
Bark Quantity (kg/ha)	8.844
Leaves Quantity (kg/ha)	41.99

Current harvest, process and storage methods

Harvest period	July-October
Usable organs/parts	Leaf and Bark
Post-harvest treatment (s)	Sun-dry

Recommendation	Overexploitation should be avoided.
No. of person involved in collection/sale	

People's knowledge on quantity of the species:

- Well known

Local use of the species:

- Used as spices in the vegetables for taste and flavor.
- Raw leaves of plant are taken orally to treat sore threat.

Informal/Traditional rules for conservation:

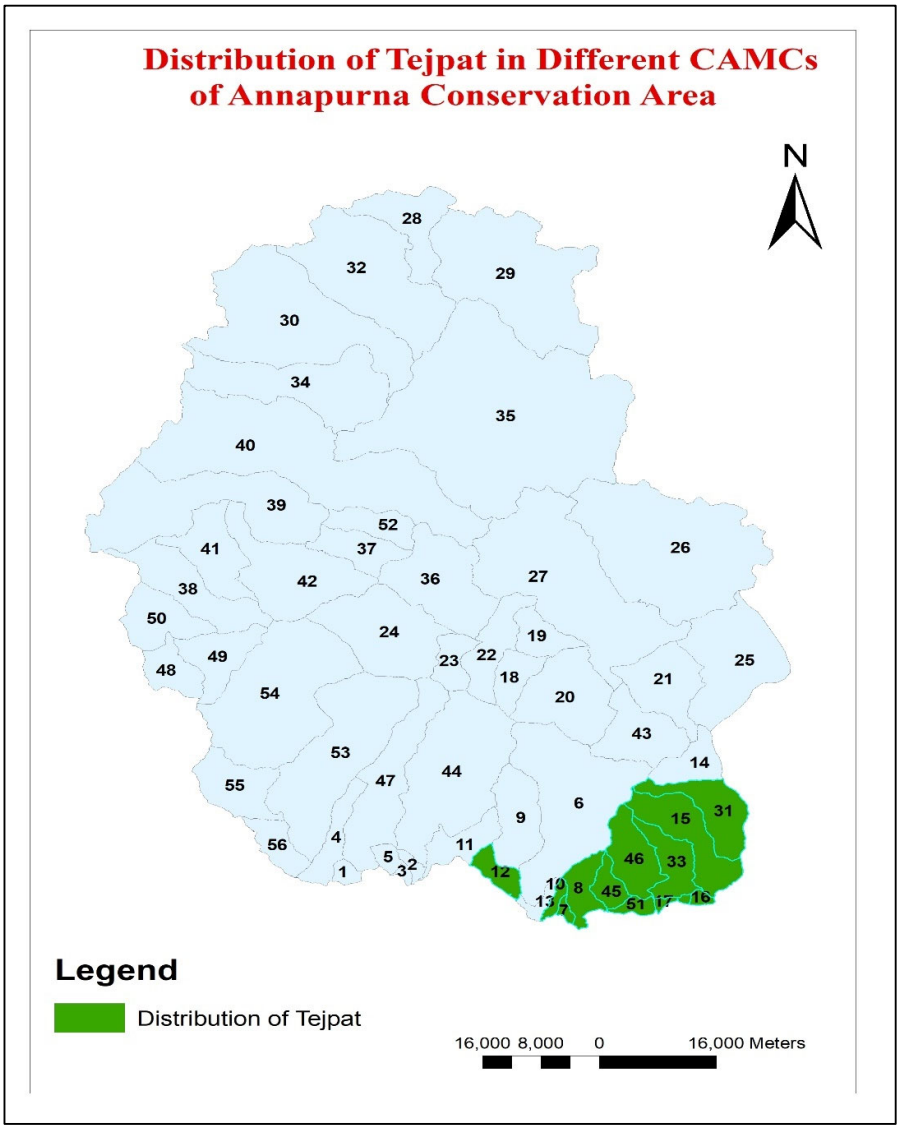
- N/A

Major problem in cultivation, collection/harvest:

- N/A

Other information:

- It is rubbed on body to cure scabies.



Reference:

Shah, M., & Panchal, M. (2010). Ethnopharmacological properties of Cinnamomum tamala – A review. *International Journal of Pharmaceutical Sciences Review and Research.*

NTNC-CODEFUND. (2016). Annapurna Conservation Area Management Plan (2016 to 2020) Final Draft. National Trust for Nature Conservations.

Dutta, I.C. (2007*). Non Timber Forest Products of Nepal: Identification, Classification, Ethnic Uses and Cultivation.* HillSide Press(P) Ltd

26. *Hippophae salicifolia* D.Don

Family: Eleaegnaceae

Nepali name (s): Daale chuk, Taare chuk, Kaara chuk, Chichi, Kharpu, Phesakpo

Local name (s): Tarbu namtar (Amchi), Kyun singh, Finchi (Gurung), Tarbu, Tirchu (Sherpa), Chugo (Tamang), Chichi (Thakali)

Common name (s): Willow-leaved Sea Buckthorn, Sea-buckthorn, Sand thorn

Description: It is a dioecious shrub or small tree, typically reaching heights of 2 to 6 meters and a diameter of about 50 centimeters, characterized by a dense grey crown and rough brown or black bark. The leaves are alternate, narrow, lanceolate, and have a greyish hue. Flowering generally commences around 3 to 4 years of age. Male inflorescences bear 4 to 6 apetalous flowers that release pollen at approximately 6°C, indicating a degree of stress tolerance to temperature variations, high soil pH (around 8.0), and soil salinity. Female inflorescences consist of a single apetalous flower with one ovary and ovule. Insect pollination is hindered due to the absence of nectarines in both male and female flowers, thus reliance on wind pollination. The fruits, typically ranging from 5.51 to 7.24 mm in size, are initially pale green and ripen to a golden-brown color by September. These berries feature a tough outer skin enclosing juicy pulp and a small, hard, oval seed.

Ecology: H. salicifolia thrives in low-humidity environments, particularly in alluvial gravel, wet landslips, and riversides. It exhibits versatility, capable of growing in both arid and very wet conditions.

Conservation and legal status

UCN: N/A
GoN: N/A
CITES: N/A

Distribution

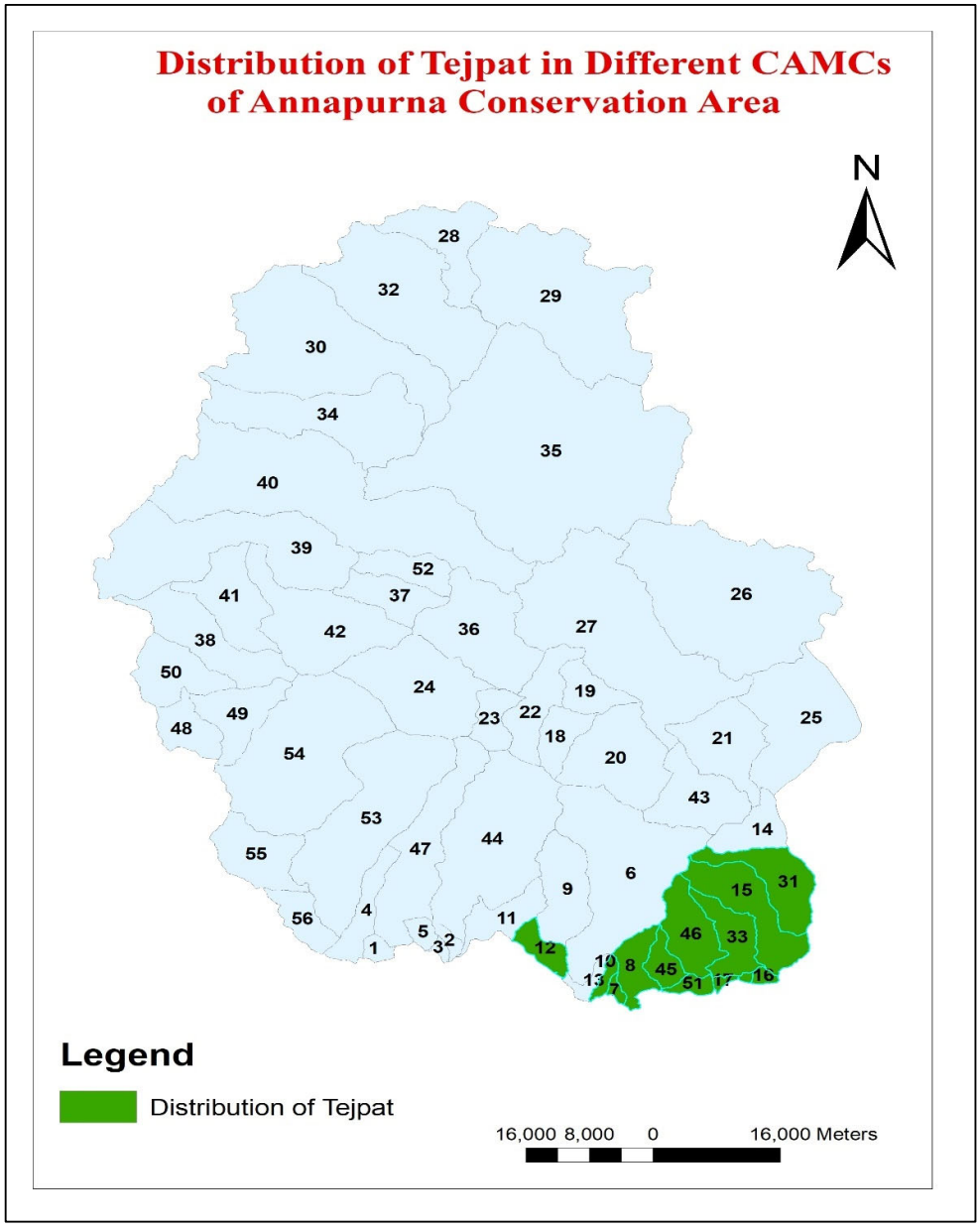
Nepal: WC; 2200-3500m
ACA: Chame, Dharapani, Kobang, Kunjo, Lete, Marpha, Parche, Tachain Bagarchhap, Thonche and Tukuche CAMCs

Availability in ACA

Attributes	Amount
Area (ha)	7876.66
Quantity (kg/ha)	22.93

Current harvest, process and storage methods

Harvest period	October
Usable organs/parts	Fruits, Leaves and Barks
Post-harvest treatment (s)	Due to its delicate nature, it's important to process the fruits immediately after harvesting to avoid damage
Recommendation	Hand picking stands out as the most suitable harvesting method. Develop agro-techniques for its cultivation.
No. of person involved in collection/sale	All community members



People's knowledge on quantity of the species:
Lately, there has been a gradual decline in both the quantity and density of the species.

Local use of the species:

- Nutritional food, cosmetics, nitrogen-fixing soil, water conservation and as a fuel source.
- Used in the treatment of asthma, skin diseases, gastric ulcers, lung disorders, cough, diarrhea and menstrual disorders.
- Its extensive root system makes it valuable for reclaiming and preserving soil, particularly on delicate slopes, aiding in soil conservation efforts.
- Utilized for various purposes, including providing timber, fuel, and fodder, as well as serving as a protective barrier around homes and cultivated fields to deter wild animals.

Informal/Traditional rules for conservation:

- Harvesting of fully ripe fruit is allowed only after the permission from local head by all the local villagers.

Major problem in cultivation, collection/harvest:

- Difficulty arises in collecting fruits due to the plant's tall stature and the delicate nature of its fruits, leading to potential damage during harvest.

Other information:

- The significant concentration of triacylglycerol and fatty acids within the seed oil makes it a popular choice for a range of skin treatments and cosmetic products, including moisturizers, lotions, and creams designed for skincare purposes.
- Enhanced researcher-farmer interactions are crucial for implementing effective measures such as better plantations, germplasm maintenance, optimal resource utilization, careful fruit collection, and utilization of medicinal properties for this valuable species.

Reference:

Pant, M., Lal, A., & Rani, A. (2014). Hippophae salicifolia D Don- A Plant with Multifarious Benefits. *International Journal of Pharmacy and Pharmaceutical Sciences.*

NTNC-CODEFUND. (2016). Annapurna Conservation Area Management Plan (2016 to 2020) Final Draft. National Trust for Nature Conservations.

27. *Rubus ellipticus Sm.*

Family: Rosaceae

Nepali name (s): Ainselu

Local name (s): Ainselu

Common name (s): Golden evergreen raspberry, Yellow Himalayan Raspberry

Description: It is a thorny shrub reaching heights of 1-3 meters. Its branches are purplish-brown or brownish, covered in sparse curved prickles and dense purplish-brown bristles or glandular hairs. The leaves are imparipinnate with three leaflets, the terminal one being notably larger than the lateral leaflets. Its flowers form terminal clusters and have white or pink petals that are longer than the sepals. The fruits are golden yellow, subglobose, and detach easily from the plant. This species produces numerous small seeds.

Ecology: It thrives in diverse habitats such as forest edges, open hillsides, dry slopes, and montane valleys across the Himalayas, displaying adaptability to semi-shade or no shade conditions within sparse forests.

Conservation and legal status
IUCN: N/A
GoN: N/A
CITES: N/A

Distribution
Nepal: WCE; 600-3300m
ACA: Dhampus, Ghachok, Khudi, Lahachok, Lwang-Ghalel, Machhapuchhre, Rivan, Sardikhola, Simpani and Uttarkanya CAMCs

Availability in ACA

Attributes	Amount
Area (ha)	7721.22
Quantity (kg/ha)	29.092

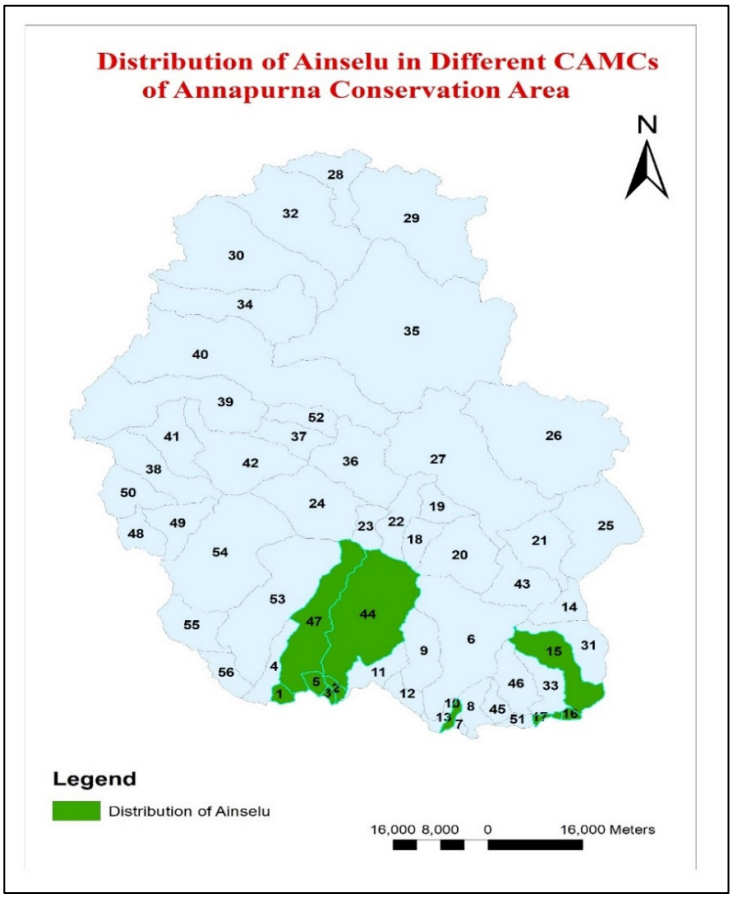
Current harvest, process and storage methods

Harvest period	May-July
Usable organs/parts	Root, Fruit, Bark and Leaves

Post-harvest treatment (s)	Fruits taken freshly or store it in cool area and sun-dry others
Recommendation	
No. of person involved in collection/sale	All age people collect fruit to eat.

People's knowledge on quantity of the species:

- Well known



Local use of the species:

- Inner bark as a kidney tonic and an anti-diuretic.
- Juice extracted from the root has been used for fevers, gastric problems, diarrhea and dysentery and the root paste, applied to wounds promote healing.
- The fruit juice is also used to bring down the temperature of a fever and for colic, and is good for sore throats and colds too.
- Leaf juice along with milk is used as a febrifuge.

Informal/Traditional rules for conservation:

- N/A

Major problem in cultivation, collection/harvest:

- N/A

Other information:

- Different parts of the plant have been claimed to be useful in ailments like diabetes, diarrhea, gastralgia, dysentery, epilepsy and as wound healing agent, anti-fertility agent, antimicrobial analgesic and renal tonic.

Reference:

Pandey, Y., & Bhatt, S. S. (2016). Overview of Himalayan yellow raspberry (Rubus ellipticus Smith.): A nutraceutical plant. *Journal of Applied and Natural Science, 8*(1), 494–499.

NTNC-CODEFUND. (2016). Annapurna Conservation Area Management Plan (2016 to 2020) Final Draft. National Trust for Nature Conservation.

28. *Thysanolaena latifolia (Roxb. ex Hornem.) Honda*

Synonym: *Thysanolaena maxima* (Roxb.) Kuntze

Family: Poaceae

Nepali name: Amleeso

Local name: Kusaaraa (Gurung), Saaphaa (Rai)

Common name: Tiger grass, Broomgrass, Asian broomgrass, Nepalese broomgrass

Description: A tall, reed-like perennial grass is commonly found on shady forest slopes, particularly on damp, steep banks along ravines and watercourses. The grass has solid, smooth, and rounded stems that can reach up to 4 meters in height and are as thick as a little finger. Its large, broad leaves resemble those of bamboo and taper to a fine point. The grass features terminal panicles that are dense and bushy, resembling a foxtail, and can be 30-90 cm long.

Ecology: It occurs in tropical and sub-tropical zones. It grows in open slopes, shady cliffs, forest margins and river banks

Conservation and legal status:
IUCN: N/A
GON: N/A
CITES: N/A

Distribution:
Nepal: WCE; 100-2100 m
ACA: Bhachok, Bhoje, Bhujung, Ghanapokhara, Khudi, Mijuredanda, Simpani, Taghring, Thumaakodanda and Uttarkanya CAMCs.

Availability in ACA

Attributes	Amount
Area (ha)	2302.42
Quantity (kg/ha)	33.854

Current harvest, process and storage methods

Harvest period	December-March
Usable organs/parts	Root, Leaves and inflorescence
Post-harvest treatment (s)	Sun-dry
Recommendation	Grow on marginal land which are unsuitable for cultivation.

No. of person involved in collection/sale N/A

People's knowledge on quantity of species:

- Well-Known

Local use of the species:

- Inflorescence bundles for brooms.
- Root paste for boils.
- Root extract as a laxative and anthelmintic.

Informal/tradtional rules for conservation:

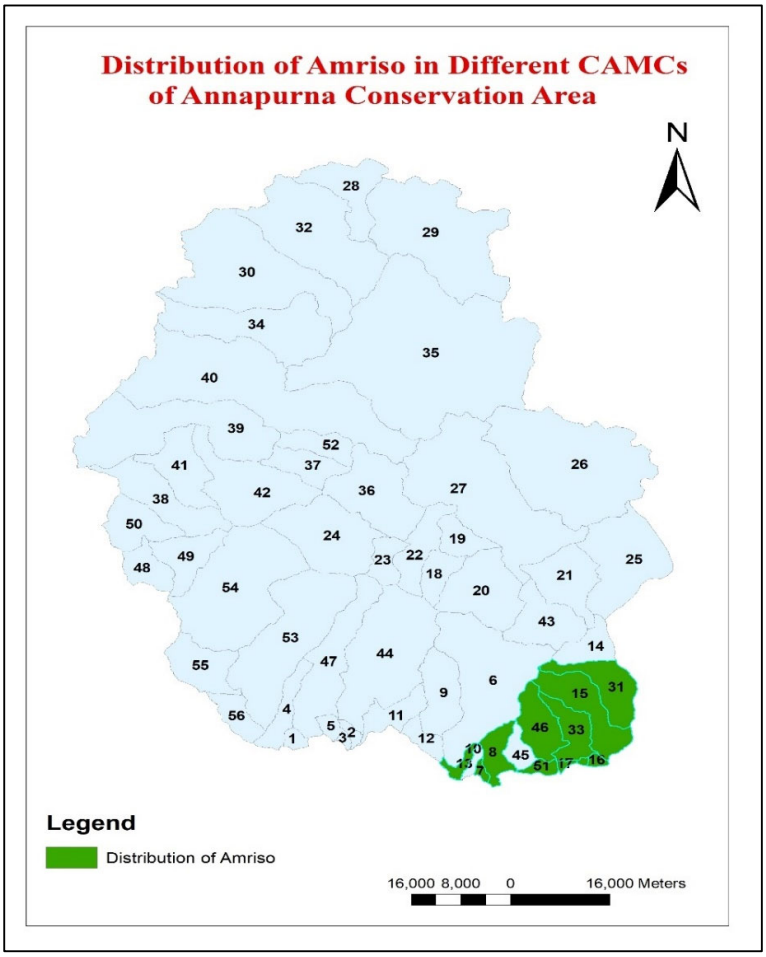
- N/A

Major problem in cultivation, collection/harvest:

- N/A

Other information

- N/A



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Dutta, I.C. (2007*). Non Timber Forest Products of Nepal: Identification, Classification, Ethnic Uses and Cultivation.* HillSide Press(P) Ltd.

Niveditha, T. M. A., & Swamy, P. B. (2016). *Thysanolaena latifolia* (Roxb. ex Hornem) Honda as natural resource and product for the tribals of Srikakulam District, Andhra Pradesh, India. *Indian Journal of Natural Products and Resources, 7*(2), 181-184.

Ghimire, S. K., Subedi, C. K., Budha-Magar, S., Adhikari, M., Pandey, T. R., Awasthi, B., Thapa Magar, S., Paudeyal, M. R., Ghimire, K. M., Shrestha, B. B., Bhatt, G. D., Joshi, L. R., Paudel, A., Chapagain, D. J., & Gurung, J. (2021). *Flora of Kailash Sacred Landscape Nepal: An annotated checklist. Volume 1 (Gymnosperms and Angiosperms: Ephedraceae – Buxaceae).* Research Centre for Applied Science and Technology (RECAST), Tribhuvan University.

29. *Rhododendron anthopogon* D.Don

Family: Ericaceae

Nepali name (s): Sunpati

Local name (s): Sunpati, Balucha, Palu

Common name (s): Dwarf Rhododendron

Description: It is a highly aromatic small shrub reaching heights of up to 60 cm. It typically bears clusters of 4-6 white or yellowish translucent petals. Flowering occurs from mid-May to July.

Ecology: Its habitat consists of rocky and mountainous terrain. on open rocky slopes in alpine zones in association with *Rhododendron setosum*.

Conservation and legal status
IUCN: N/A
GoN: N/A
CITES: N/A

Distribution
Nepal: WCE; 3000-5100m
ACA: Bharaka, Bhujung, Chhonhup, Chhoser, Chhusang, Ghami, Ghanapokhara, Ghyaru, Jhong, Jomsom, Kagbeni, Khangsar, Khudi, Lomanthang, Manang, Marpha, Muktinath, Namarjung, Nar, Ngawal, Parche, Pasgaun, Phoo, Pisang, Surkhang, Taghring, Tanki Manang and T-sarang CAMCs

Availability in ACA

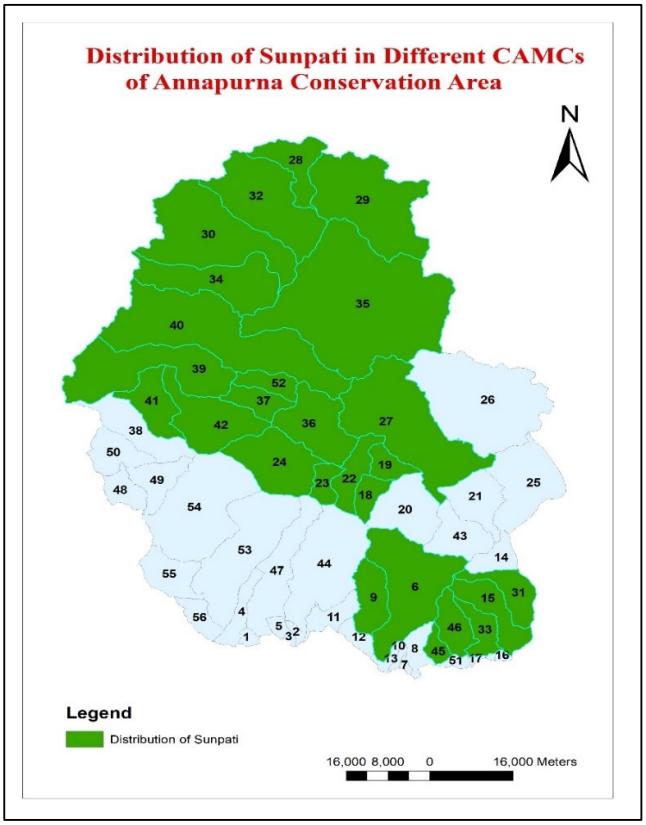
Attributes	Amount
Area (ha)	63557.57
Flower Quantity (kg/ha)	0.18
Leaves Quantity (kg/ha)	7.06

Current harvest, process and storage methods

Harvest period	July-August
Usable organs/parts	Stem, Leaves, Flowers and Fruits
Post-harvest treatment (s)	Sun-dry and store
Recommendation	Avoid complete harvesting
No. of person involved in collection/sale	N/A

People's knowledge on quantity of the species:

- Well known



Local use of the species:

- Leaves used for the treatment of bronchitis, cough and cold by the natives of Himalaya.
- Flowers used by local people in herbal tea and in the treatment of ailments like gonorrhea and stomach disorders.
- Leaves have diaphoretic and digestive properties and are used in cough and various skin disorders.
- Dried flower in powdered form mixed with oil and used in post-delivery complications.
- Leaves and twigs used for making incense.

Informal/Traditional rules for conservation:

- N/A

Major problem in cultivation, collection/harvest:

- N/A

Other information:

- N/A

Reference:

Pathak, M. L., Shrestha, B. B., Joshi, L., Gao, X. F., & Jha, P. K. (2018). Anatomy of two Rhododendron species along the elevational gradient, Eastern Nepal. *Banko Janakari, 28*(2), 32-44.

Baral, B., Shrestha Vaidya, G., Laxmi Maharjan, B., & Teixeira Da Silva, J. A. (2015). Phytochemical and antimicrobial characterization of Rhododendron anthopogon from high Nepalese Himalaya. *Botanica Lithuanica, 20*(2), 142–152. doi:10.2478/botlit-2014-0009

Guleria, S., Jaitak, V., Saini, R., Kaul, V. K., Lal, B., Babu, G. D. K., ... Singh, R. D. (2011). Comparative studies of volatile oil composition of Rhododendron anthopogon by hydrodistillation, supercritical carbon dioxide extraction and head space analysis. *Natural Product Research, 25*(13), 1271–1277. doi:10.1080/14786419.2011.576395

NTNC-CODEFUND. (2016). Annapurna Conservation Area Management Plan (2016 to 2020) Final Draft. National Trust for Nature Conservation.

30. *Allium hypsistum* Stearn

Family: Amaryllidacea

Nepali name (s): Jimbu

Local name (s): Jimbu

Common name (s):

Description: It is endemic to Nepal. The roots are thick and elongated. The bulb can be solitary or clustered, cylindrical in shape, with a yellowish-brown outer layer. Leaves vary from linear to broad and are usually shorter than or equal to the stem, with a distinct central vein. The stem is often triangular, sometimes with narrow wings, and covered in leaf sheaths only at the base. The spathe usually has one or two parts and falls away after flowering. The flower cluster is typically hemispherical, with individual flower stalks about two to four times as long as the perianth. The perianth segments spread out and then curve back after flowering, varying in color from red to purple. The filaments are slender, shorter than or equal to the perianth segments, and attached to the base of the segments. The ovary is smooth and obovoid-globose, containing two ovules per chamber. The style is longer than the ovary.

Ecology: Growing in forest margins, scrub, moist meadows, stream banks

Conservation and legal status:
IUCN: N/A
GoN: N/A
CITES: N/A

Distribution:
Nepal: CE, 2300-4800m
ACA: Chhonhup, Chhoser, Chhusang, Ghami, Lomanthang, Phoo, Surkhang and T-sarang CAMCs

Availability in ACA

Attributes	Amount
Area (ha)	9464.5
Quantity (kg/ha)	3.36

Current harvest, process and storage methods

Harvest period	July to October
Usable organs/parts	Whole plant
Post-harvest treatment (s)	Sun dry, pack and store in dry areas

Recommendation	Rotational harvesting and further domestication
No. of person involved in collection/sale	N/A

People's knowledge on quantity of the species:

- Well known

Local use of the species:

- Cure enough, stomach pain, flues and as spices

Informal/Traditional rules for conservation:

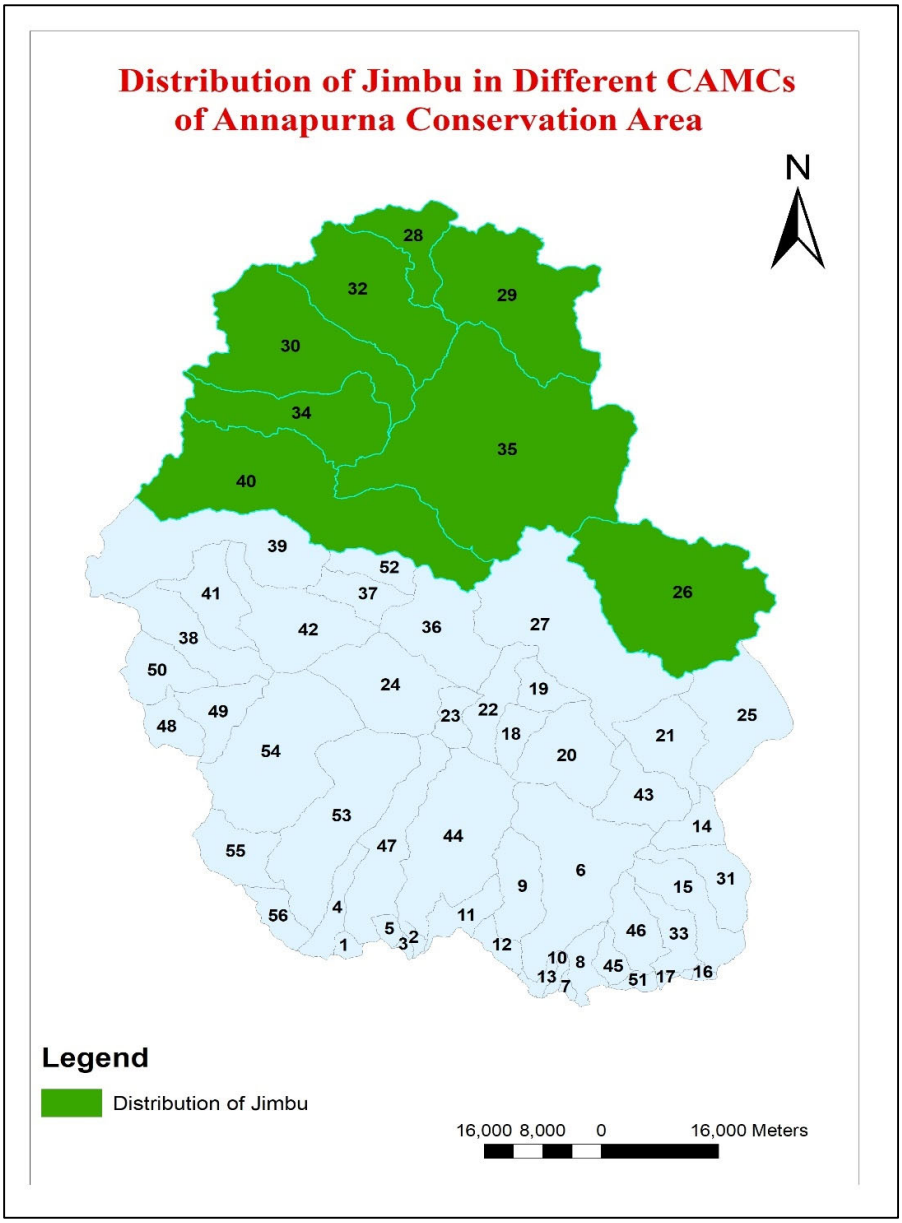
- N/A

Major problem in cultivation, collection/harvest:

- Deterioration of vegetation caused by the grazing of sheep, goats and other livestock.
- Excessive harvesting of parent plants for agricultural expansion.

Other information:

- Species favored by livestock.



Reference:

Panta, A. (2019). Medico-ethnobiology, indigenous technology and indigenous knowledge system of Newar Ethnic group in Khokana village of Lalitpur district Nepal.

David, B. (2014). Nepalese Allium (Jimbu).

31. *Arisaema speciosum* (Wall.) Mart.

Family: Araceae

Nepali name (s): Sarpa ko Makai, Bish jharne

Local name (s): Sarpa ko Makai, Dhakayo

Common name (s): Himalayan Giant Cobra Lily

Description: The primary distinctive characteristic of the plant lies in its corm, which is rhizomatous, annulated, and cylindrical, measuring over 15cm in length and 4-10cm in diameter. The solitary leaf is divided into three segments. The spathe is chocolate-purple, striped, and tapers into a tail-like tip.

Ecology: It is found in cool mountain ranges of Himalayas.

Conservation and legal status
IUCN: N/A
GoN: N/A
CITES: N/A

Distribution
Nepal: CE; 2000-3000 m
ACA: Dangsing, Ghachok, Ghandruk, Ghara, Lumle, Lwang-Ghalel, Narchang and Shikha CAMCs

Availability in ACA

Attributes	Amount
Area (ha)	20264.73
Quantity (kg/ha)	53.2225

Current harvest, process and storage methods

Harvest period	October
Usable organs/parts	Shoot
Post-harvest treatment (s)	Drying
Recommendation	
No. of person involved in collection/sale	N/A

People's knowledge on quantity of the species:

- well known

Local use of the species:

- The plant is sun-dried and utilized as a vegetable. Additionally, it is employed in the treatment of benign warts.

Informal/Traditional rules for conservation:

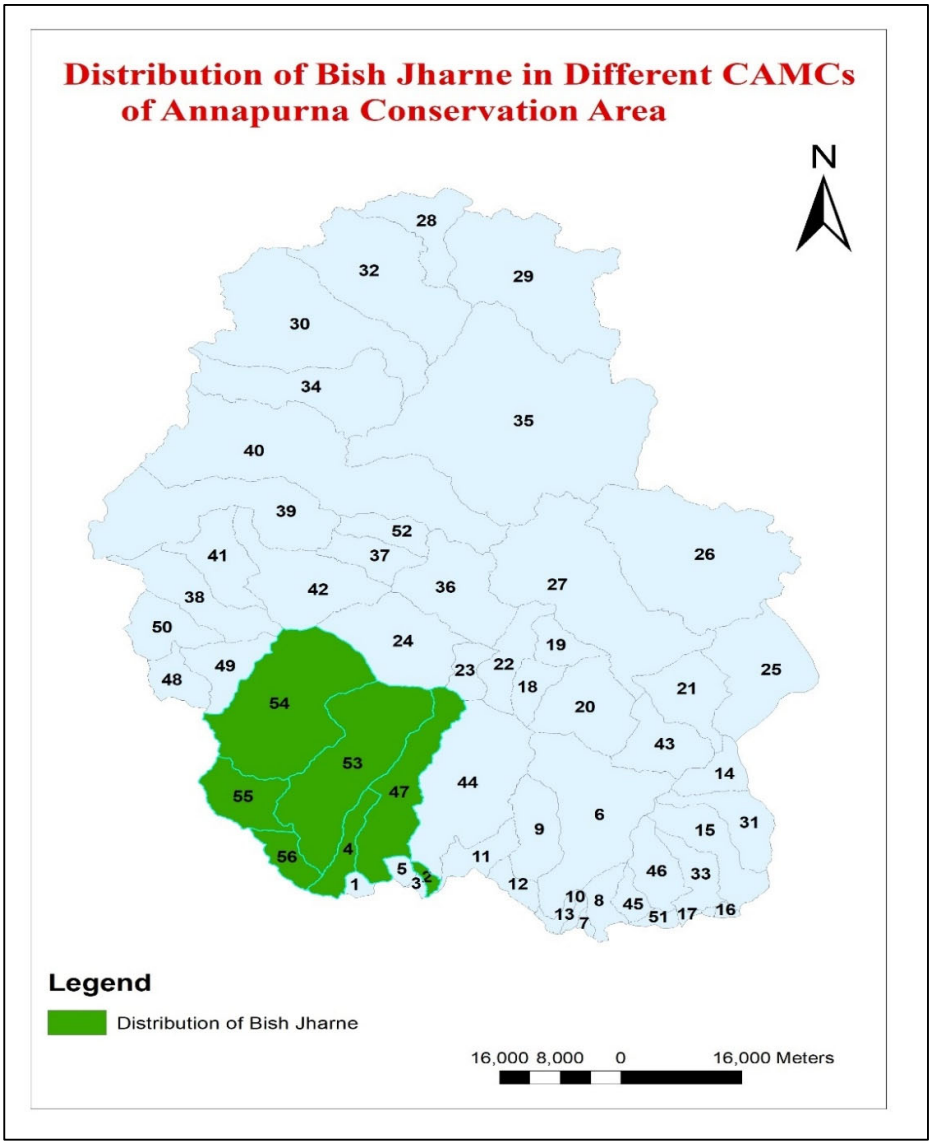
- N/A

Major problem in cultivation, collection/harvest:

- N/A

Other information:

- N/A



References:

Vikram, D., Kshitija, D., Jatinder, S., Kumar, S. A., Kumar, A. S., & Singh, K. S. (2010). Purification and characterization of an anti-proliferative and mitogenic plant lectin from tubers of Arisaema speciosum. *Pharmacognosy Journal, 2*(9), 266–277. https://doi.org/10.1016/s0975-3575(10)80115-4

NTNC-CODEFUND. (2016). Annapurna Conservation Area Management Plan (2016 to 2020) Final Draft. National Trust for Nature Conservation.

32. *Dactylorhiza hatagirea* (D.Don) Soó

Family: Orchidaceae

Nepali name (s): Panchaunle, Hathejara

Local name (s):

Common name (s): Salep, Himalayan Marsh Orchard

Description: The plant is a terrestrial, upright herb reaching heights of up to 60 cm. It features palmately divided tuberoids, along with broadly lanceolate, oblong-ligulate, or elliptic leaves. Its flowers, which are purplish-lilac, rose, or occasionally white, are arranged in dense, cylindrical inflorescences with numerous blooms.

Ecology: Found in alpine and sub-alpine regions.

Conservation and legal status
IUCN: Endangered
GoN: Banned for collection, transportation and trade
CITES: Appendix-II

Distribution
Nepal: WCE; 2800-4200m
ACA: Bhujung, Ghanapokhara, Khudi, Lete, Namarjung, Parche, Pasgaun and Taghring CAMCs.

Availability in ACA

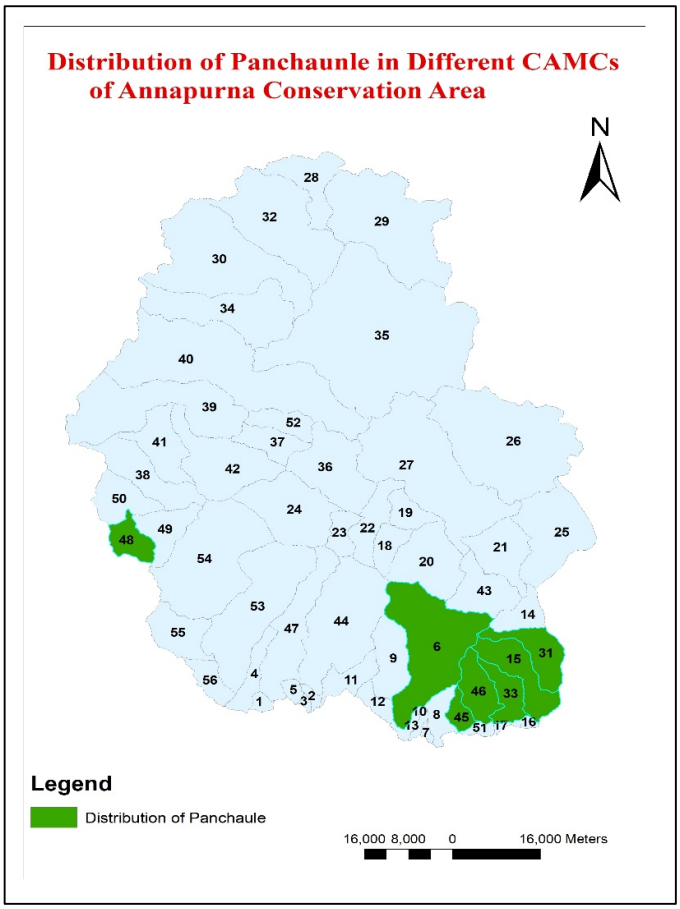
Attributes	Amount
Area (ha)	3298.45
xQuantity (kg/ha)	1.27

Current harvest, process and storage methods

Harvest period	August -September
Usable organs/parts	Roots, Rhizomes and Young shoots
Post-harvest treatment (s)	Illegal to collect and harvest in Nepal.
Recommendation	Illegal to collect and harvest in Nepal.
No. of person involved in collection/sale	Illegal to collect and harvest in Nepal.

People's knowledge on quantity of the species:

- Well known



Local use of the species:

- The root tuber serves as an expecBhuin chuknt, astringent, demulcent, and aphrodisiac, and it is rich in nutrients. Furthermore, a paste or powder derived from the rhizome is applied to cuts and wounds to promote rapid healing. The tuber is also employed to alleviate symptoms associated with headache, fever, cough, and cold.

Informal/Traditional rules for conservation:

- Training and awareness programs at the community level for grazing management.

Major problem in cultivation, collection/harvest:

- Key challenges to the preservation of D. hatagirea include unsustainable harvesting practices, insufficient in-situ and ex-situ awareness initiatives, and illicit trading of the plant's rhizomes.

Other information:

- Natural factors such as a small population size, significant geographical isolation, and harsh environmental conditions pose threats to Dactylorhiza hatagirea. These orchids are not only rare by nature but also exhibit high habitat specificity. Additionally, the Himalayan mouse hare (Ochotona roylei) and the Monal pheasant contribute to additional pressure on the plants by feeding on their tubers, leading to the destruction of their quality and quantity.

Reference:

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33. *Lycopodium clavatum* L.

Family: Lycopodiaceae

Nepali name: Nagbeli

Local name: Nagbeli

Common name: Lycopodium

Description: It is a trailing or creeping herb with branched stems and ascending branches. The leaves are crowded, narrow, lanceolate, and incurved. The herb features cylindrical, stalked spikes in pairs, accompanied by ovate membranous leaves. Lycopodium powder is pale yellow, highly mobile, and has no odor or taste. It feels greasy to the touch and readily adheres to fingers. With a density of 1.06-1.09, it floats on water without becoming wet. Each spore is shaped like a triangular pyramid with a convex base, and its outer surface is covered with polygonal reticulations. When the spores are crushed, they release small drops of yellowish fixed oil.

Ecology: A perennial club moss that grows prostrate and creeping.

Conservation and legal status:
IUCN: N/A
GON: N/A
CITES: N/A

Distribution:
Nepal: 1800-2400 m
ACA: Bhoje, Bhujung, Ghanapokhara, Khudi, Pasgaun, Sildujure and Taghring.

Availability in ACA

Attributes	Amount
Area (ha)	4036.81
Quantity (kg/ha)	30.67

Current harvest, process and storage methods

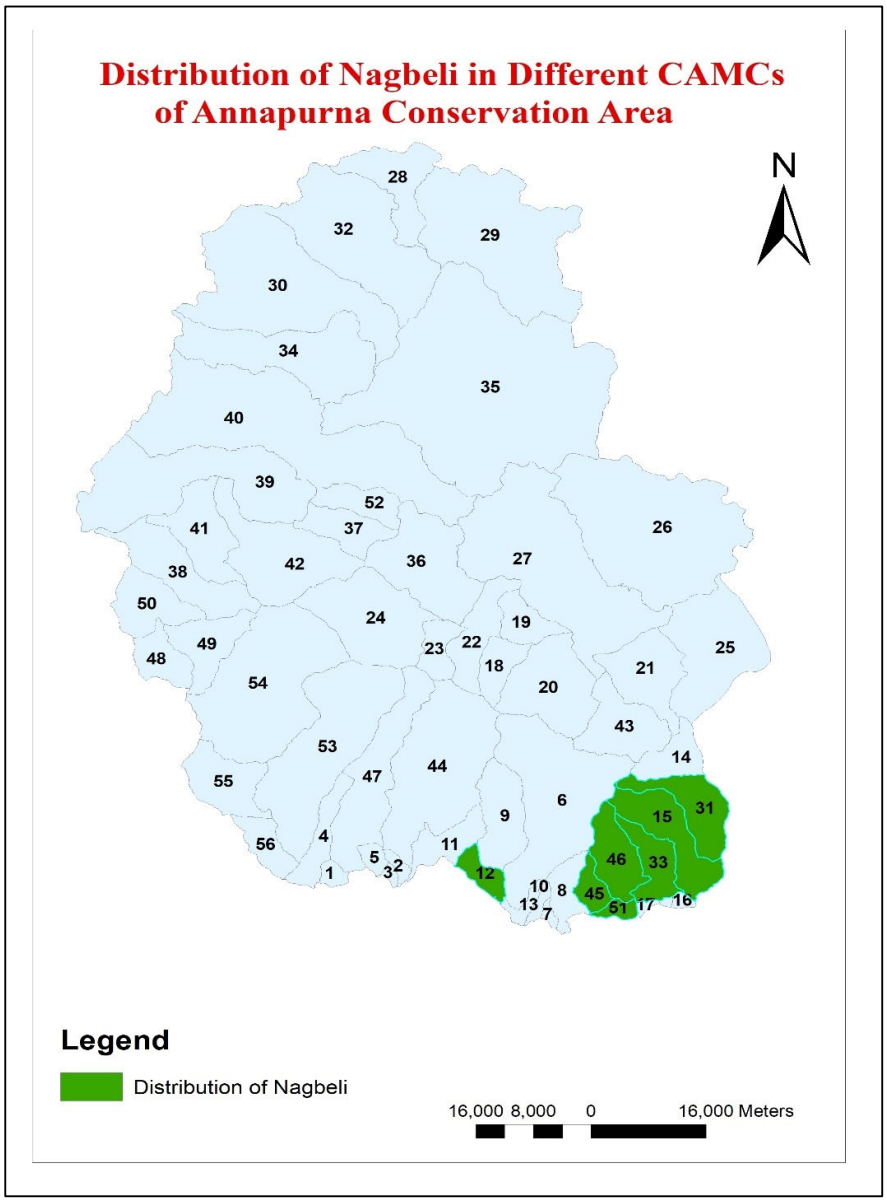
Fruiting period	March-July
Flowering period	January-September
Usable organs/parts	Whole plant
Post-harvest treatment (s)	Sun-dry and powder
Recommendation	
No. of person involved in collection/sale	N/A

People's knowledge on quantity of species:

- N/A

Local use of the species:

- It is used as a dusting powder and absorbent for skin excoriations.
- It is sometimes used as a coating for pills to prevent them from sticking together.
- A decoction of this plant is utilized for treating rheumatism and diseases of the lungs and kidneys.



Informal/tradtional rules for conservation:

- N/A

Major problem in cultivation, collection/harvest:

- N/A

Other information:

- N/A

References:

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34. *Machilus odoratissimus* Nees

Synonym: *Laurus odoratissimum* Wall.

Family: Lauraceae

Nepali name: Bhate Kaulo, Seto Kaulo

Local name: Kaulo

Common name: Fragnant Bay Tree

Description: It is an evergreen tree with grey and rough barks. Color of leaves and flowers are green and yellowish-green respectively.

Ecology: It occurs in sub-tropical and the himalaya's lower part. It prefers to grow rapidly in the high area (300-700 m from sea level) and rainfall 2000 to 3000 mm.

Conservation and legal status:
IUCN: Least concern
GON: N/A
CITES: N/A

Distribution:
Nepal: 300-2200 m
ACA: Bhoje, Bhujung, Ghanapokhara, Khudi, Pasgaun, Simpani, Taghring and Thumaakodanda CAMCs

Availability in ACA

Attributes	Amount
Area (ha)	2025.13
Amount (kg/ha)	9.85

Current harvest, process and storage methods

Harvest period	October-November
Usable organs/parts	Bark and Leaves
Post-harvest treatment (s)	Dry and powder bark
Recommendation	Avoid overharvesting
No. of person involved in collection/sale	N/A

People's knowledge on quantity of species:

- N/A

Local use of the species:

- Incense is made from bark and leaves are given as fodder to livestocks.

- Also, bark and leaves are utilized in snake-bite, burned wounds as it is used as antiseptic and anti-inflammatory remedies.

Informal/tradtional rules for conservation:

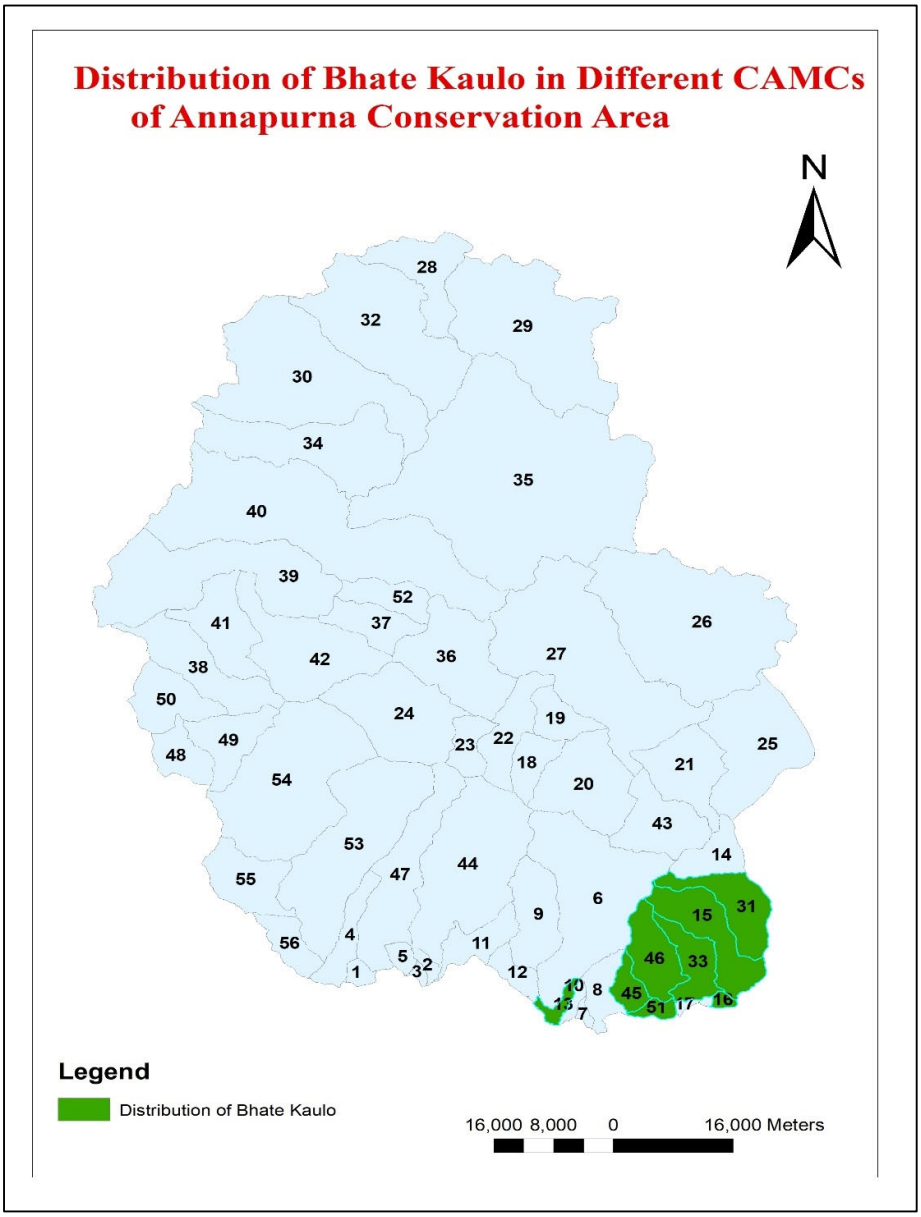
- N/A

Major problem in cultivation, collection/harvest:

- N/A

Other information

- N/A



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35. *Aconitum gammiei* Stapf

Synonym: *Aconitum dissectum* D.Don

Family: Ranunculaceae

Nepali name (s): Sikh, Madhubikh

Local name (s): Pongar

Common name (s):

Description: The plant is 75-100 centimeters tall and has branching stems. The stems are covered in fine hairs at the base but smooth towards the top. The middle leaves have long petioles, are mostly smooth, and are shaped like a subpentagon with a heart-shaped base. The inflorescence is terminal, measuring 6-9 centimeters in length and bearing 3-5 flowers with smooth pedicels. The sepals are blue-purple, with elliptic lower sepals and obliquely orbicular-lanceolate lateral sepals. The upper sepal is navicular-galeate, with a concave lower margin. The petals are approximately 2.4 centimeters long, sparsely hairy, with a lip measuring about 5.5 millimeters. The stamens are sparsely hairy, with either entire or 2-denticulate filaments. There are 5 glabrous carpels.

Ecology: Alpine shrubberies and open slope

Conservation and Legal status:
IUCN: N/A
GON: N/A
CITES: N/A

Distribution
Nepal: CE; 3300-4900m
ACA: Bharaka, Khangsar, Manang, ©Nar, Ngawal, Phoo and Tanki Manang CAMCs

Availability in ACA

Attributes	Amount
Area (ha)	1565.8
Quantity (kg/ha)	1.39

Current harvest, process and storage methods

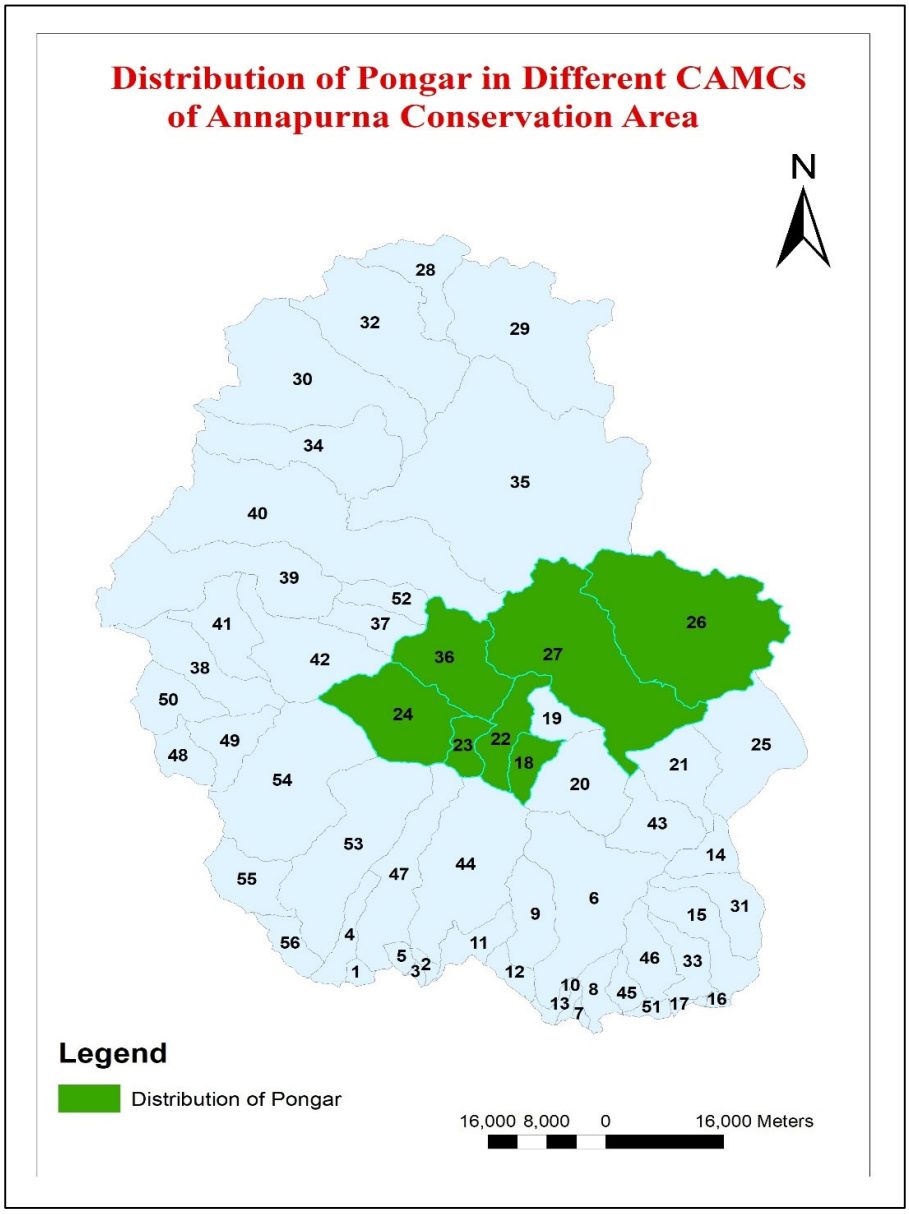
Harvest period	N/A
Usable organs/parts	Roots
Post-harvest treatment (s)	Sun-dry
Recommendation	Carefully collect after maturation
No. of person involved in collection/sale	N/A

People's knowledge on quantity of species:

- Well known

Local use of the species:

- N/A



Informal/Traditional rules for conservation

- N/A

Major problem in cultivation, collection/harvest:

- N/A

Other information

- The whole plant is highly toxic. Simple skin contact has caused numbness in some people.

36. *Berberis griffithiana* C.K.Schneid.

Synonym: *Berberis asiatica* Griff.

Family: Berberidaceae

Nepali name (s): Chutro, Rasanjan

Local name (s): Kirmundro

Common name (s): Barberry

Description: It is a shrub with an upright growth habit, lackinhg hair and adorned with sharp spines. It typically reaches heights of 3 to 6 meters. Its leaves vary from ovate to elliptic in shape, with pointed to rounded tips, and can be either smooth-edged or toothed. The plant produces clusters of yellow flowers arranged in corymbs, and its fruits are oval to elongated in shape, with a vibrant red hue.

Ecology: These plants grow in shady shrubbery, grassy slopes, and rocky terrain, often preferring north-facing slopes and dry hillside environments.

Conservation and legal status
IUCN: N/A
GoN: N/A
CITES: N/A

Distribution
Nepal: 1800-3500m; WCE
ACA: Dhampus, Lwang, Rivan, Lahchok, Machhapuchre, Sardikhola, Bhujung, Pasgaun, Simpani, Khudi, Uttarkanya, Ghanapokhara, Taghring, Bhachok, Lumle, Narchang, Sikha and Dangisng CAMC

Availability in ACA

Attributes	Amount
Area (ha)	16685.37
Amount (kg/ha)	11.317

Current harvest, process and storage methods

Harvest period	May-June
Usable organs/parts	Root, Stem, Bark, Flower and Fruits
Post-harvest treatment	Sun-dry root for 4-5 days after root harvest

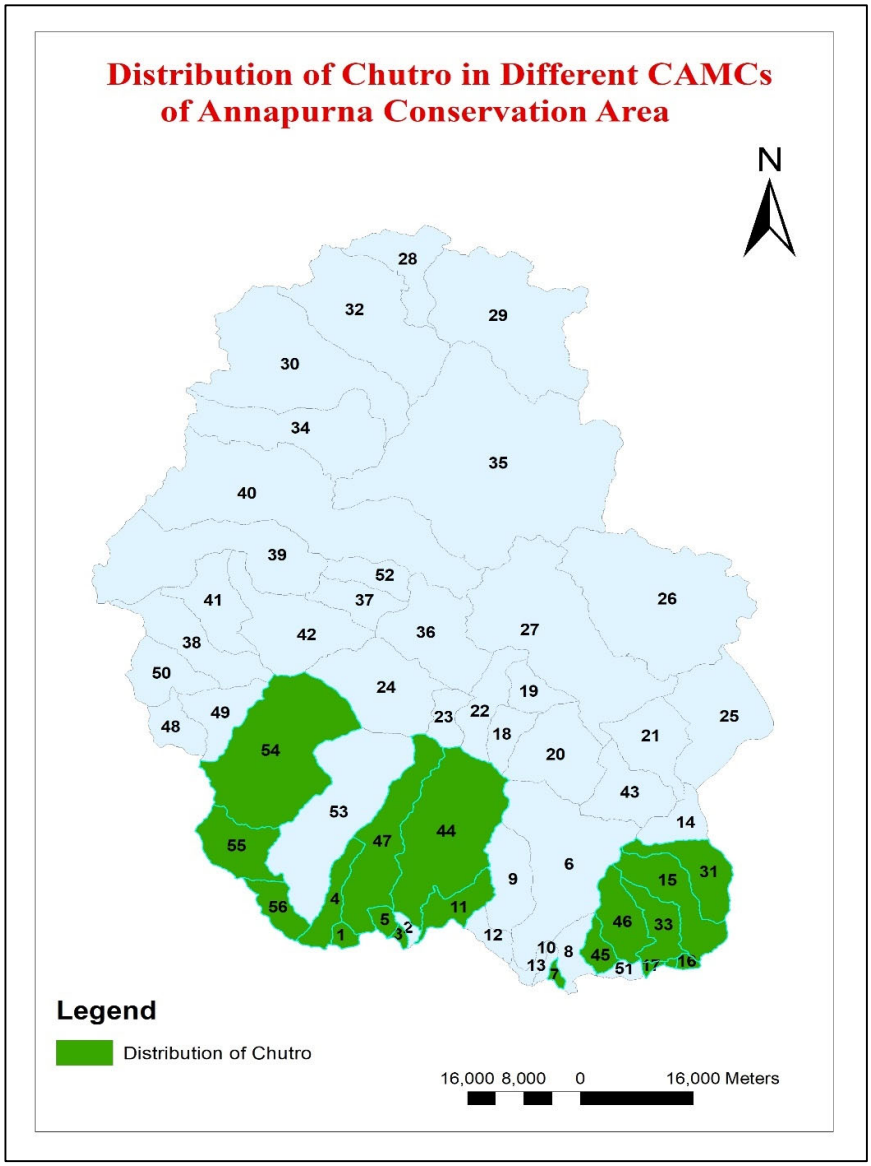
Recommendation	Avoid excessive root harvesting
No. of person involved in collection/sale	

People's knowledge on quantity of the species:

- Well known

Local use of the species:

- Wood and root bark: Used for digestive issues, as a laxative, to induce sweating, reduce fever, and prevent infection.
- Ripe fruit: Taken for diarrhea and jaundice.
- Decoction of root bark: Used for malaria, skin diseases, and excessive menstrual bleeding.



Informal/Traditional rules for conservation:

- N/A

Major problem in cultivation, collection/harvest:

- N/A

Other information:

- N/A

Reference:

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Table 126- Name of CAMCs respective to the levelling in different maps

S.N.	Label	CAMC
1	1	Dhampus
2	2	Ghachok
3	3	Lahachok
4	4	Lumle
5	5	Ribhan
6	6	Namarjung
7	7	Bhachok
8	8	Mijuredanda
9	9	Parche
10	10	Saimarang
11	11	Sardikhola
12	12	Sildujure
13	13	Thumakodanda
14	14	Dharapani
15	15	Khudi
16	16	Simpani
17	17	Uttarkanya
18	18	Manang
19	19	Ghyaru
20	20	Pisang
21	21	Bagarchhap
22	22	Bhraka
23	23	Manang
24	24	Khangsar
25	25	Thonche
26	26	Phoo
27	27	Naar
28	28	Chhonhup
29	29	Chhoser
30	30	Tsarang
31	31	Taghring
32	32	Lomanthang
33	33	Ghanpokhara
34	34	Ghami
35	35	Surkhang
36	36	Tanki Manang
37	37	Muktinath
38	38	Tukuche
39	39	Kagbeni
40	40	Chhusang
41	41	Marpha
42	42	Jomsom
43	43	Chame

44	44	Machhapuchhre
45	45	Pasgaun
46	46	Bhujung
47	47	Lwang Ghalel
48	48	Lete
49	49	Kunjo
50	50	Kobang
51	51	Bhoje
52	52	Jhong
53	53	Ghandruk
54	54	Narchyang
55	55	Sikha
56	56	Dangsing

4. SUSTAINABLE MANAGEMENT OF NTFPS IN ACA

NTFPs encompass all tangible outputs from forests, including those derived from plants, animals, and minerals. In addition to timber, forests yield numerous non-timber products. The communities residing in and around these forests depend heavily on a diverse array of forest products for their daily survival needs. These products also play significant roles in their economic activities, religious practices, and cultural traditions.

As a vital source of income, NTFPs offer significant off-farm employment opportunities for local communities. However, the primary focus should be on the economic advantages of NTFPs rather than just their conservation and sustainable use. A limited understanding of these resources can lead to their rapid depletion. Over-harvesting, improper collection practices, and untimely gathering are common issues due to this knowledge gap, especially in open access or communal property areas where NTFPs are found. Local collectors often lack the necessary knowledge for sustainable harvesting techniques, resulting in practices that deplete these resources. Additionally, due to insufficient knowledge of value addition, collectors typically sell raw, unprocessed products, missing out on potential benefits. This limited skill set prevents them from capturing the true value of NTFPs. Furthermore, premature and unscientific collection methods can lead to both the extinction of NTFPs and a decline in their quality, which in turn affects pricing negatively.

Since the NTFP market is controlled by buyers and end users, they determine the prices based on the quality and quantity of the products. NTFPs of substandard quality have no market value. Collectors often focus more on gathering large quantities rather than ensuring quality and meeting standards. Without proper attention to quality and standards, the efforts to make a profit will be futile and could result in losses.

4.1 Sustainable harvest

Collection methods and harvested quantities should be managed to avoid damaging the species' ability to regenerate. During harvesting, it is essential to conserve habitats and maintain the critical minimum population levels. A certain minimum number of plants or plant parts must remain untouched during collection to ensure sustainability. These critical minimum levels vary depending on the plant species. Chapter 3.9 recommends species-specific harvesting protocols that should be adopted and strictly adhered to.

Table 127: Resource categories and recommended harvesting protocols

Resource categories	Recommended harvesting protocol
Flowers	10% of the flowers of each plant and additionally 10-15% of the whole population.
Leaves	25-30% of the leaves from trees or bushes (Depending upon the habitat of the plant population.
Barks	65% of the bark on the trunk
Seeds/Fruit	10-20% of the underground resources of plant population.

Roots, rhizomes, tubers and bulbs	20-30% of the underground resources of plant population.
Whole plants	15-20% of the plant population.

Source: (NTNC-CODEFUND, 2016)

4.2 Impact of harvest

Harvesting has both short-term and long-term effects on the population dynamics of NTFPs. Reducing the population of specific species can make them vulnerable, as their ability to recover from catastrophic events like overharvesting and deforestation diminishes. The overall ecological impact of NTFP harvesting depends on factors such as availability, the nature and intensity of harvesting, and the species being harvested. Occasional and minimal harvesting has little impact on the long-term stability of the plants. However, intensive annual harvesting of underground parts, roots, and rhizomes can lead to the elimination of the species. Additionally, the indiscriminate felling of trees for bark and leaves can result in negative outcomes in a short period.

Table 128: Impact of over harvest in NTFPs

Short term impact	Long term impact
Reduction in the product availability: Immediate decrease in the quantity of harvested product.	**Persistent decline in population density:** Continuous reduction in the number of individuals of the harvested species over time.
Population density alterations: Changes in the number of individuals per unit area of the species being harvested.	**Reduction in Average size and Reproductive Capacity:** Decrease in the size of the adult plants and their availability to reproduce effectively.
Variability in Growth patterns: Fluctuations in the growth rates of species as a result of increased harvesting practices.	**Diminished size of Harvested Parts:** Smaller sizes of targeted plant parts such as bulbs, roots and rhizomes.
Shifts in population demographics: Changes in the age and size distribution within the species population.	**Changes in chemical composition:** Alterations in chemical composition of harvested species, potentially affecting their value.
Short-term Economic Benefits and Subsequent scarcity: Initial economic gain from increased sales, followed by price hikes due to resource scarcity.	**Long-Term Ecosystem Degradation and Decreased Carbon Sequestration:** Gradual deterioration of forest ecosystems and reduced ability to capture and store carbon.
Immediate loss of Biodiversity: Quick reduction in species diversity due to overharvesting.	**Loss of traditional knowledge and practices:** Loss of cultural heritage related to the use of NTFPs.

4.2.1 Impacts on annual and perennial herbs

There is a strong correlation between harvesting intensity and the population dynamics of NTFPs. The immediate impact of harvesting annual species is primarily on seed dispersal. Unmanaged and overexploitation of annual NTFP species can lead to their complete elimination. Perennial NTFPs are often harvested for their underground parts, and harvesting these parts can have similar effects to harvesting mature plants. While mature plants may survive the removal of underground parts, their productive capacity is significantly diminished.

4.2.2 Effects of harvesting on fruits and seeds

Harvesters typically collect fruits and seeds by lopping or cutting, which can immediately affect the quality of the fruits and drastically impact the distribution and abundance of fruit resources in the forest. Premature harvesting of fruits or pods negatively impacts the future availability of these species. Uncontrolled harvesting leads to the gradual extinction of the exploited species.

4.3 Guidelines for the Sustainable Harvesting of NTFPs

To ensure sustainable management of Non-Timber Forest Products (NTFPs), it is essential to harvest them in ways that prevent resource degradation. The timing of harvests plays a critical role in maintaining the quality of NTFPs. The stages of growth—whether leaves, flowers, fruits, roots, or entire plants—during collection significantly influence the chemical composition, active ingredients, microscopic and sensory properties, microbial contamination, chemical residues, and heavy metal content, all of which are closely linked to the season of collection. Each species and their parts require specific methods of collection, appropriate seasons, and post-harvest treatments to enhance the value of the harvested NTFPs. The following guidelines should be observed during NTFP harvesting:

1. Identify the useful parts of the herb to ensure that the valuable portion is collected, and the non-useful part is left behind.

2. Determine the correct season for harvesting NTFPs before beginning the process.

3. Avoid harvesting in wet conditions.

4. Place collected NTFPs in clean, dry bags or baskets.

5. Only collect mature plants or plant parts.

6. Leave some portions of the NTFPs in place to allow for regeneration.

7. Consider the topography and the nature of the plants to ensure that the collection period does not exceed a month.

8. Harvest roots and rhizomes during the winter season.

9. Collect leaves only after the spring and rainy seasons, ensuring they are mature.

10. Harvest bark, bulbs, and exudations in the autumn months (September-November).

11. Gather flowers when they first appear and before they fully bloom.

12. Collect fruits when they appear and after they have matured.

13. Harvest seeds before they reach full maturity.

14. If harvesting occurs in wet conditions, dry the products in the shade.

15. Avoid mixing different species or different parts of the same plant.

16. Ensure that collected or harvested materials are properly dried.

17. Store NTFPs in clean, dry, sunny bags in a well-ventilated room.

By following these guidelines, the quality and sustainability of NTFP harvests can be maintained, ensuring that the resources are not degraded, and their value is maximized.

4.4 Seasons and Protocol of Harvesting

4.4.1 Harvesting seasons

The maturation period, active chemical constituents, quantity, and harvesting periods of Non-Timber Forest Products (NTFPs) are significantly influenced by interspecific genetic differences and geographical locations. The optimal time to collect NTFPs is immediately after they reach maturity. Collecting at this phenological stage allows for seed dispersal and ensures the plant has accumulated high levels of active constituents, unlike harvesting at a premature stage. Mature harvests also support regeneration.

For Timur fruits, the timing of the harvest is crucial. The maturity of Timur fruits affects both the essential oil content and seed quality. These fruits should be harvested when they are fully mature, typically between October and mid-November, depending on the altitude of the growing area. Harvesting too early, such as in August, is not advisable due to the high moisture content and lower aromatic oil levels. In September, Timur fruits enter the maturity phase, turning a bright brick red color and becoming highly aromatic, which indicates they are ready for harvest.

To minimize losses during harvest, the use of secateurs and gloves is recommended to enhance speed and protect hands from pricking. De-thorning mature branches can facilitate early harvest, although this should not be done on young fruit-bearing branches. De-thorning allows easier access to fruits by climbing the plant, enabling nearly all fruits to be harvested and reducing losses.

The collection of NTFPs often depends on the availability of harvesters' free time, typically occurring during the slack period of agricultural activities. In high-altitude regions, NTFP collection is a part-time activity associated with transhumant pasBhuin chuklism during the warmer months (May-October). The collection schedule is dictated by the availability of NTFPs and continues until the onset of snowfall. The harvesting months of major NTFPs in the Annapurna ACA are detailed in the accompanying table.

Table 129: Flowering, fruiting and collection calendar of major NTFPs in ACA

Name	Flowering	Fruiting	Month of collection

Ophiocordyceps sinensis		April-May	Mid-May to July
Neopicrorhiza scrophulariiflora	June-August	August	October-November
Delphinium denudatum	June-August		October-November
Paris polyphylla	April-May	June-July	July-August
Rheum australe	May–June	October-November	June-July
Rhododendron anthopogon	May-July		July-August
Girardinia diversifolia	July-August	July-October	June-July
Swertia chirayita	July-October	August-December	November-December
Asparagus racemosus	August-November	June-July	June-July
Daphne bholua	October-April	March-June	End of September or mid-october

4.4.2 Harvesting protocol

The following protocols should be adhered to for the sustainable harvest of Non-Timber Forest Products.

Table 130: NTFPs harvesting protocols in ACA

Resource type	Collection seasons	Suggested harvesting protocols
Underground parts (e.g. root, rhizome, tuber and bulb)	October-January (Ashwin to Poush)	• Harvest only the desired portions of the plants. • Dig up only mature and older plants. • Dig up only mature and older plants. • Leave or replant the apical portions of tubers, immature sister bulbs, seedling parts and immature plants. • Keep the harvesting level to 70%.

		• Conduct harvesting operations in areas with a high abundance of these species.
Leaves	September onward (Ashwin-Kartik; but not in rainy and flowering season)	• Harvest leaves with small twigs using a sharp sickle. • Allow up to 80% of the leaves to be harvested. • Avoid lopping branches or felling the tree.
Barks	Before spring (Sept.-Nov.) (Bhadra-Mangsir)	• Use a sharp knife to peel off the bark. • Ensure the wound is less than 20 cm wide, less than 80 cm long and less than 1 cm deep. • Keep a distance of more than 30 cm between wounds. • The extracted bark should not exceed 33% of the trunk's surface area.
Floral parts (e.g. flower, fruit and seed)	Fruits and seeds are mature during autumn and should be harvested accordingly	• Harvest fruits either by hand-picking or gently thrashing with a stick to avoid damaging the branches. • Allow for the harvest of up to 90% of flowers, fruits and seeds. • Harvest mature ripe fruits before seed dissemination occurs.
Whole plants	Oct.-Dec. (Ashwin-Mangsir)	• Collect plant materials only when they are completely matured, after seeds have fully formed, matured, dried and dispersed. • Harvest 85% of the population while implementing rotational harvesting techniques.
Climbers	Nov.-Jan. (Mangsir-Poush)	• Trim the aerial portion to a height of 10 cm above ground level. • Harvest stems that are greater than 5 cm in diameter. • Permit the harvest of 85% of the stem portion. • Do not pull out stem portions attached to the soil surface; leave them for regeneration.

4.5 Post-harvest treatment and quality assurance

Maintaining quality is crucial for NTFP trade, as low-quality products have limited market access and fetch lower prices. Specific norms and technologies must be followed during pre- and post-harvest periods to uphold NTFP quality and standards.

Harvesters should be aware of any legal restrictions before collection. NTFPs should be harvested at their peak quality stage, with post-harvest operations playing a vital role in maintaining quality. Collected material must be cleaned, dried, graded, and stored properly.

Post-harvest techniques vary by species, as NTFPs from different sources and ages can differ significantly in size and chemical composition. Washing and sun-drying with suitable substrate are recommended post-harvest practices, avoiding drying over open fire or in smoke. Harvesters often clean herb parts, slice them, and sun-dry them to maintain quality. Specific post-harvest techniques are recommended for major NTFPs, tailored to their characteristics and requirements.

Table 131: Post-harvesting procedure of major NTFPs in ACA

Resource type	Post harvesting process and techniques
Underground parts (e.g. root, rhizome, tuber and bulb)	• Ensure harvested products are free from dirt and dust through cleaning. • Remove small, unwanted roots, rootlets and any foreign materials by screening. • Slice tuber and roots to facilitate efficient drying. • Dry them under the sun. • Provide special treatment for tuberous roots and rhizomes of specific NTFPs such as Asparagus racemosus, Dactylorhiza hatagirea, Dioscorea deltoidea and *Rheum australe*.
Leaves	• Post-harvest techniques are determined by the characteristics of the marketable products. • Dry the harvested leaves either under sunlight or in a shaded, ventilated area.
Barks	• The bark should be dried either in the sun or in the air. • Smoke drying is strictly forbidden. • Store the dried bark in clean gunny bags. • Ensure all foreign materials are removed before sBhuin chukge.
Floral parts (e.g. flower, fruit and seed)	• Depending on the nature of the products, they require special care before being dried in the sun or shade.
Whole plants	• Dry the entire mature plant in a partially shaded area to prevent leaf shedding.
Climbers	• Remove the papery bark or scales by scraping. • Cut the stem into pieces 5 to 6 cm long before drying. • Sun-dry the cut stem pieces. • Some cut stems, like those of Gurjo, can quickly regenerate when exposed to moisture. • To prevent regeneration, pound the cut stems to speed up the drying process. • Properly store the dried material in airtight polyvinyl bags.

4.6 Grading

Cleaning and grading should be performed immediately after collection. To maintain quality, do not mix harvested products from different sites. Both collectors and traders should be involved in grading before transportation and export.

Ensure that merchandise is fully dried, with moisture content not exceeding 10%. Roots and rhizomes must be clean, free from dust, dirt, and any adulterating materials. They should be of good quality, large, thick, and devoid of foreign materials such as small, unwanted roots and rootlets.

NTFPs must contain an acceptable or minimum quantity of active ingredients or chemical constituents. Collectors should be encouraged to enhance the general quality and uniformity of collected material during harvest, paying attention to selecting mature plants, proper drying, and removing unwanted plant parts and rootlets. Traders must be aware of the quality criteria for their merchandise and should encourage collectors to sell only premium quality material to ensure better prices by differentiating between poor and good quality materials. Periodic moisture content checks and re-drying as necessary are essential throughout the storageperiod.

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ANNEX:

Annex 1: Field Assessment Details

Sikles Team				
Date (Nepali)	**Date (English)**	**CAMCs**	**Localities**	**Activities**
20/06/2080	10/7/2023	Parche	Khilang, Bhumethang mathi khilang, Lizaafat	Survey
21/06/2080	10/8/2023	Parche	Khilang, Parche and Uro parche	Survey
22/06/2080	10/9/2023	Parche	Uro parche, Parche and Sikles	Survey
23/06/2080	10/10/2023	Parche	Kori area, Sikles and Thulne	Survey
16/07/2080	11/2/2023	Sildujure	Kerabari, Gheche, Chipli, Nekoche and Taprang	Survey
17/07/2080	11/3/2023	Sildujure	Maidaan, Pipeline, Kaseri dada, Thaak, Parke pani and Taprang	Survey
18/07/2080	11/4/2023	Sildujure	Thaak, Taprang and halo taasni dado	Survey
19/07/2080	11/5/2023	Namarjung	Ghyaamrang, Tooni khola, Tursyo and Portaare	Survey
20/07/2080	11/6/2023	Namarjung	Taangting, Naujaa Dada and Thera	Survey
21/07/2080	11/7/2023	Namarjung	Taangting	Survey
16/08/2080	12/2/2023	Thumaakoda	Chhahare bhir pakha, Chimaale pakha, Piditale pakha	Survey
17/08/2080	12/3/2023	Thumaakoda	Yangjakot	Survey
18/08/2080	12/4/2023	Saimarang	Paindu, Warchok, Lamtari dada and Narchok	Survey
19/08/2080	12/5/2023	Bhachok	Bhachok	Survey
Bhujung Team				
Date (Nepali)	**Date (English)**	**CAMCs**	**Localities**	**Activities**
16/12/2080	3/29/2024	Bhujung	Timpula Kharga, Kanjeri, Meso Kharga, Salagi, Keyorsa and Kama Ban	Survey
17/12/2080	3/30/2024	Bhujung	Kama Ban, Keyorsa, Syulu, Chyudi, Danda Kharga, Nisho Kharga, Chude Kho, Kanjeri, Raisi Kho, Tesro besaune chautara and Kalma	Survey
18/12/2080	3/31/2024	Bhujung	Kalma, Kalmasi Kharga, Odhar ban, Naisima, Falma, Maidu, Palma, Kokho, Komakho, Khatryankhutru, Kharsey Kharga, Saiti, Tugungo, Kali Patyanki, Sunlo, Sagu, Cherbune chautara, Kyubaar, Dhome dharmasala and Tallo deurali	Survey
19/12/2080	4/1/2024	Ghanapokhara	Kallobesi, Palma, Timupla, Kharka, Maidu, Falma, Palma, Rorucho, Misakho, Parchegauda and Thokyo	Survey

20/12/2080	4/2/2024	Ghanapokhara	Thokyo, Thodi, Naisima, Chisaa, Timuplakharka, Sagu, Chergune, Chautara, Maidu, Saiti, Naisima, Tallo deurali, Kyubaar kharka, Gopte and Pai Khola	Survey
21/12/2080	4/3/2024	Pasgaun	Khomre dada, Khomre, Khumerg, Ragu and Palidada	Survey
22/12/2080	4/4/2024	Bhoje	Tamu, Tamu dada, Tamu besi, Tamu gaau and Kyorsa	Survey
23/12/2080	4/5/2024	Uttarkanya	Khagumbesi, Kaamdu, Midim Bagum	Survey
25/12/2080	4/7/2024	Khudi	Taraapu, Topu, Dhakai Besi, Dhagain, Harsing and Neche Kharga	Survey
26/12/2080	4/8/2024	Khudi	Nerche Kharga, Kaudi Kharga, Khilapu, Mede Kharga, Basman Chautara, Kaprongfedi, Kaprong, Basman Chautara, Sirung pakha and Ghosing pakha	Survey
27/12/2080	4/9/2024	Khudi	Ghosing pakha, Kandae chaur, Dhagaun pakha, Arkhale besi, Thaku besi, Khudi, Tar Kuha, Taraapu and Khudiche	Survey
28/12/2080	4/10/2024	Taghring	Khilapu, Mede Kharga and Basman chautara	Survey
29/12/2080	4/11/2024	Taghring	Kaprong Fedi, Kaprong and Nigale Pakha	Survey
30/12/2080	4/12/2024	Simpani	Lam Pokhari, Siddhatan, Siddha ko pakha, Balamchaur, Kalani Mandir, Kalaai pakha, Balamchaur pakha and Barrock pakha	Survey
Jomsom Team				
Date (Nepali)	**Date (English)**	**CAMCs**	**Localities**	**Activities**
20/12/2080	4/2/2024	Lete	Ghasaside, Lete water tank, Dhampu, Dhampu Dada, Lete Deurali, Dhampu pari, Lete Kharka and Kalopani	Survey
21/12/2080	4/3/2024	Lete	Letepari, Kalopani, Ghasa, Kariku Khola, Dhampu and Lete	Survey
22/12/2080	4/4/2024	Kunjo	Taglung, Titi, Nupsang, Khark, Nupsang Forest, Nupsang and Jhipra deurali	Survey

23/12/2080	4/5/2024	Kunjo	Jhipra deurali	Survey
24/12/2080	4/6/2024	Kobang	Naurikot, Kobang dada, Pari Kharka	Survey
25/12/2080	4/7/2024	Kobang	Parikharka, Sirkung and Marche Lek	Survey
26/12/2080	4/8/2024	Tukuche	Nalanda School, Thapakhola, Tukuche Kharka and Mithillo Tukuche	Survey
27/12/2080	4/9/2024	Tukuche	Raniban and Chokhpani	Survey
28/12/2080	4/10/2024	Marpha	Old Marpha Village, Pani tanki and Chhairo camp	Survey
29/12/2080	4/11/2024	Marpha	Chhairo Kharka, Syang gold gumba and Syang	Survey
1/1/2081	4/12/2024	Jomsom	Yarazho, Kumle forest and Namu Lek	Survey
2/1/2081	4/13/2024	Jomsom	Raniban, Ecogrowo apple farm, Kaisang and Kshamatal	Survey
3/1/2081	4/14/2024	Kagbeni	Tirilake, On the way to Sangta and Dhakar Jhong	Survey
4/1/2081	4/15/2024	Kagbeni	Lungbuk cave, Kharka and Kagbeni	Survey
5/1/2081	4/16/2024	Jhong	Jhong and Putak	Survey
6/1/2081	4/17/2024	Jhong	Chhengur	Survey
7/1/2081	4/18/2024	Muktinath	Lupra	Survey
8/1/2081	4/19/2024	Muktinath	Lupra	Survey
9/1/2081	4/20/2024	Muktinath	Lupra	Survey
10/1/2081	4/21/2024	Muktinath	Lupra	Survey
11/1/2081	4/22/2024	Muktinath	Lupra	Survey
12/1/2081	4/23/2024	Muktinath	Apple farm	Survey
13/1/2081	4/24/2024	Muktinath	Coral	Survey
14/1/2081	4/25/2024	Muktinath	Apple farm	Survey
15/1/2081	4/26/2024	Muktinath	Apple farm	Survey
16/1/2081	4/27/2024	Muktinath	Gumba	Survey
17/1/2081	4/28/2024	Muktinath	Gumba	Survey
18/1/2081	4/29/2024	Muktinath	Khunga	Survey
19/1/2081	4/30/2024	Muktinath	Jharkot	Survey
20/1/2081	5/1/2024	Muktinath	Jharkot	Survey
21/1/2081	5/2/2024	Muktinath	Jharkot	Survey

Lomanthang Team				
Date (Nepali)	**Date (English)**	**CAMCs**	**Localities**	**Activities**
12/20/2080	4/2/2024	Lomanthang	Panga and Karalisung	Survey
1/1/2081	4/3/2024	Chhonhup	Chhonhup lek	Survey
2/1/2081	4/4/2024	Chhoser	Chhoser Lekh	Survey
3/1/2081	4/5/2024	T-sarang	Lamnmalan	Survey
4/1/2081	4/6/2024	Surkhang	Ghara Lek	Survey
5/1/2081	4/7/2024	Ghami	Dakamar Lake	Survey
6/1/2081	4/8/2024	Chhusang	Chhusang Lek	Survey
Manang Team				
Date (Nepali)	**Date (English)**	**CAMCs**	**Localities**	**Activities**
5/12/2080	8/29/2023	Dharapani		Survey
8/12/2080	8/30/2023	Thoche		Survey
9/12/2080	8/31/2023	Uttarkanya		Survey
11/12/2080	9/1/2023	Tachain Bagarchap		Survey
12/12/2080	9/2/2023	Tachain Bagarchap		Survey
13/12/2080	9/3/2023	Chame		Survey
3/1/2080	9/4/2023	Khangsar		Survey
5/1/2080	9/5/2023	Manang and Tanki Manang		Survey
6/1/2080	9/6/2023	Bhraka		Survey
7/1/2080	9/7/2023	Ngawal		Survey
8/1/2080	9/8/2023	Ghyaru		Survey
9/1/2080	9/9/2023	Pisang		Survey
11/1/2080	9/10/2023	Nar		Survey
12/1/2080	9/11/2023	Phoo		Survey
Lwang Team				
Date (Nepali)	**Date (English)**	**CAMCs**	**Localities**	**Activities**
6/1/2081	9/17/2024	Machhapuchhre &Lwangghalel	Machhapuchhre-Saripakha, Hile and Chichimle; Lwangghalel- Chichimle	Survey
7/1/2081	9/18/2024	Machhapuchhre &Lwangghalel	Machhapuchhre-Deurali, Lubruchu, Khumai; Lwangghalel-Chimchimle	Survey

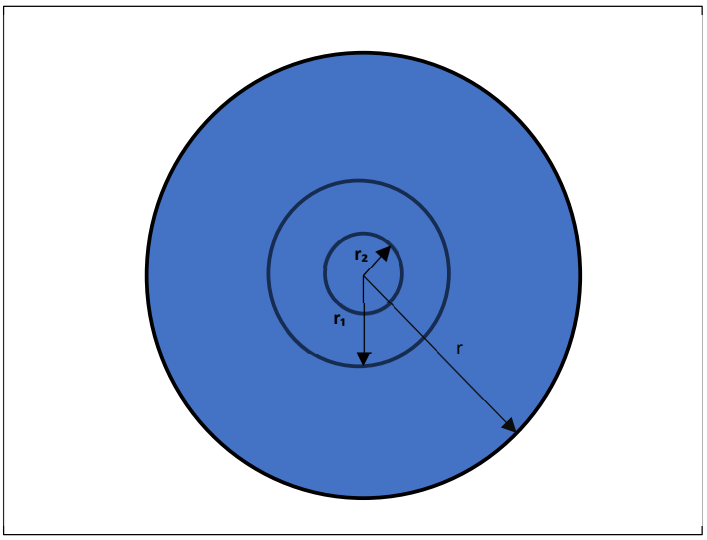
8/1/2081	9/19/2024	Machhapuchhre &Lwangghalel	Machhapuchhre-Sadal; Lwangghalel-Dodhkharka, Lowcamp	Survey
9/1/2081	9/20/2024	Lwanghalel	Badaldanda, Kuiband, Siding, Below lowcamp	Survey
10/1/2081	9/21/2024	Lwanghalel	Kamaquiee	Survey
26/1/2081	9/22/2024	Dhampus	Suire, Pitam Deurali	Survey
27/1/2081	9/23/2024	Dhampus	Pothana, Naudadha	Survey
28/1/2081	9/24/2024	Ghachok	Ghamtara, Hilekharka	Survey
29/1/2081	9/25/2024	Ghachok	Hilekharka, Julke	Survey
30/1/2081	9/26/2024	Lahachok	Armala, Odane	Survey
31/1/2081	9/27/2024	Lahachok	Odane, Deurali	Survey
1/2/2081	9/28/2024	Sardikhola & Rivan	Sardikhola-Ghalekharka, Khaimaryang; Rivan-Lalka	Survey
2/2/2081	9/29/2024	Sardikhola & Rivan	Sardikhola-Tarahill top; Rivan-Mohora	Survey
3/2/2081	9/30/2024	Sardikhola	Chyanglung; kabre	Survey
4/2/2081	10/1/2024	Sardikhola	Kabre, Mhiliphron	Survey
Ghandruk Team				
Date (Nepali)	**Date (English)**	**CAMCs**	**Localities**	**Activities**
13/1/2081	4/25/2024	Ghandruk		Survey
14/1/2081	4/26/2024	Ghandruk		Survey
15/1/2081	4/27/2024	Ghandruk		Survey
16/1/2081	4/28/2024	Sikha		Survey
17/1/2081	4/29/2024	Sikha		Survey
18/1/2081	4/30/2024	Sikha		Survey
19/1/2081	5/1/2024	Ghar		Survey
20/1/2081	5/2/2024	Ghar & Dangsing		Survey
21/1/2081	5/3/2024	Ghar & Dangsing		Survey
22/1/2081	5/4/2024	Ghar & Dangsing		Survey
23/1/2081	5/5/2024	Ghar		Survey
24/1/2081	5/6/2024	Ghar		Survey
28/1/2081	5/7/2024	Lumle		Survey
29/1/2081	5/8/2024	Lumle		Survey

30/1/2081	5/9/2024	Lumle		Survey

Annex 2: Survey and data collection techniques

For the field level assessment following process were applied:

1. Consultative meetings with Conservation Area Management Committee (CAMC).
2. Listing of NTFPs in specific CAMCs.
3. Priority ranking of the commercial NTFPs in specific CAMCs.
4. Locate species-wise abundance (Low, moderate, high) map of NTFPs.
5. Allocation of survey plots in the map on the basis of species abundance.
6. Site visit and inventory of plots.
7. Circular nested plots were used for data collection.
8. DBH of tree (>5 cm DBH, >1.3 m height) were measured by diameter tape.
9. Canopy cover was calculated through Canopy Digi program.
10. Cover percentage of herbs and shrubs were measured by simple eye observation.
11. Measure the weight of preferred NTFPs on the spot using appropriate techniques.



Layout of a sample plot: r = 10m, r_1 = 2m and r_3 =0.57m

Data analysis:

Ecological data were analyzed using following formulae:

a) Frequency (f)

Frequency is the proportion of sampling units containing the species.

$$f_i = \frac{n_i}{N} * 100$$

Where,

f_i = Frequency of species i

n_i = Number of quadrats in which species i occurred

N = Total number of quadrats studied.

b) Relative frequency (Rf)

$$Rf_i = \frac{f_i}{\bar{F}} * 100$$

where,

Rf_i = Relative frequency

f_i = Frequency of species i

$\bar{F}$ = Sum of frequencies for all species

c) Density (d)

Density is the number of individuals per unit area.

$$d_i = \frac{n_i}{N*A} * 10000$$

where,

d_i = Density (ha^{-1}) of species i

n_i = total number of individual of species i

N = Total number of quadrate studied

A = Area of quadrate studied

d) Relative density (Rd)

$$Rd_i = \frac{d_i}{D} * 100$$

where,

Rd_i = Relative density of species i

d_i = Density of species i

$\bar{D}$ = Total density of all species

e) Dominance (do)

Dominance is amount of ground covered by the tree trunk.

$$do_i = \frac{Ba_i}{N*A} * 10000$$

where,

do_i = Dominance (ha^{-1}) of species i

Ba_i = Total basal/coverage area of species i

N = Total number of quadrates studied

A = Area of a quadrat

f) Relative dominance (Rdo)

$$Rdo_i = \frac{do_i}{\overline{Do}} * 100$$

where,

Rdo_i = Relative dominance of species i

do_i = Dominance/coverage of species i

$\overline{Do}$ = Total dominance/coverage of all species

g) Important Value Index (IVI)

Tree dominancy in the surveyed areas were determined by ordering the Important Values of each tree species. Importance value was obtained by summation of the relative frequency, relative density and relative dominance.

$$IVI_x = RF_x + RD_x + Rdo_x$$

where,

IVI_x = Important Value Index of species x

RF_x = Relative of frequency of species x

RD_x = Relative density of species x

Rdo_x = Relative dominance of species x

h) Prominence value (PV)

The importance of shrub and herbs were measured through prominence value. Prominence value of species was calculated by multiplying mean percent cover of that species with square root of its frequency.

$$PV_i = C_i * \sqrt{f_i}$$

where,

PV_i = Prominence value

C_i = Mean percent cover of species i

f_i = frequency of species i

Annex 3: - UCO with number and area of quadrates surveyed

UCOs	No of CAMCs	Life forms (number, size & area of plots)						No. of plots surveyed	Total surveyed area (m^2)
		Tree (r=10m)	Area ($m^{2)}$	Shrub (r=2m)	Area ($m^{2)}$	Herb (r=56.5 cm)	Area ($m^{2)}$		
Bhujung	8	341	107128	341	4285	341	341	1023	**111754**
Ghandruk	6	90	28260	90	2247	90	89	269	**30596**
Jomsom	9	225	70714	225	2828	225	176	675	**73,719**
Lomanthang	7	0	0	99	1244	99	99	198	**1343**
Lwang	7	107	33615	107	1344	107	107	321	**35066**
Manang	13	77	24190	77	967	77	136	231	**111,754**
Sikles	7	153	48066	153	1922	153	153	459	**50142**
Total	**57**	**993**	**311974**	**1092**	**14840**	**1092**	**1102**	**3176**	**414377**

Annex 4- Field form used for data

District: …… CAMC: ……. Plot No: …… Altitude: ……m

Date: …… Forest type: …… Aspect: ……

Canopy cover (for tree plot only): ……N ……E …..S ……W C……..%

Coordinates: Easting: …… Northing: …… Locality: ……

Tree characteristics (>5cm dbh)- in 10m radius circular plot

SN	Species Name	DBH (cm)	Height (m)	Yield (gm)							Remarks
				Leaf	Bark	Stem/shoots	Root/Rhizome	Fruits/seeds	Whole plant	Other/specify	
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											

Shrubs, climber and Seedling characteristics- in 2m radius circular plot

SN	Species Name	Collar diameter (cm)	Height (m)	Yield (gm)							Remarks
				Leaf	Bark	Stem/shoots	Root/Rhizome	Fruits/seeds	Whole plant	Other/specify	
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											

Herb characteristics in 0.57m radius circular plots (N & S cardinal directions in tree plots)

Herbaceous plot 1

SN	Species Name	Collar diameter (cm)	Height (m)	Yield (gm)							Remarks
				Leaf	Bark	Stem/shoots	Root/Rhizome	Fruits/seeds	Whole plant	Other/specify	
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											

Herbaceous plot 2

SN	Species Name	Collar diameter (cm)	Height (m)	Yield (gm)							Remarks
				Leaf	Bark	Stem/shoots	Root/Rhizome	Fruits/seeds	Whole plant	Other/specify	
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											

Annex 5 – List of NTFPs recorded (plant, animal and mineral based) from ACA

S.N.	Total NTFP species	Scientific Name
1	Aaru	*Prunus persica* (L.) Batsch
2	Ainselu	*Rubus ellipticus* Smith
3	Alainchi	*Amomum subulatum* Roxb.
4	Allo	*Girardinia diversifolia* (Link) Frus
5	Amala	*Phyllanthus emblica*
6	Amaro	*Spondias pinnata* (L.f.) Kurz
7	Amriso	*Thysanolaena maxima* (Roxb.) Kuntze
8	Ankhle Jhar, Kukure	*Equisetum diffusum*
9	Asuro	*Justicia adhatoda* L.
10	Balyyangra	*Mucuna macrocarpa*
11	Ban Aalu	*Eriobotrya japonica* (Thunb.) Lindl.
12	Ban Angur	*Torricellia tillifolia* DC.
13	Ban Kapas	*Thespesia lampas* (Cav.) Daiz. & Gibs.
14	Ban Karela	*Momordica dioica* Roxb. Ex Willd.
15	Ban Lasun	*Lilium nepalense* D.Don
16	Ban Unkhu	*Sachharum spontaneum*
17	Banmula	*Raphanus raphanistrum*
18	Ban-Pyaj	*Allium sp*
19	Barro	*Terminalia bellirica* (Gaertn.) Roxb.
20	Bayajaro	*Smilax aspera*
21	Bhojpatra	*Betula utilis* D.Don
22	Bojho	*Acorus calamus*
23	Nirmasi	*Delphinium denudatum*
24	Bhote Khayar	*Parthenocissus himalayana*
25	Bhuin Amala	*Phyllanthus urinaria* L.
26	Bhuinchampa	*Kaempferia rotunda L.*
27	Bhutkesh	*Selinum sp.*
28	Bhutro	*Butea minor* Buch.-Ham.
29	Bikh	*Aconitum spicatum* (Bruhl) Stapf
30	Boke Timur	*Zanthoxylum aconthopodium*
31	Brahamali, Ghodtapre	*Centella asiatica* (L.) Urb.
32	Ganja, Bhang	*Cannabis sativa* L.
33	Caragana sp.	*Caragana brevispina* Royle
34	Chherma	*Berberis aristata* DC.
35	Chi-Chi	*Hippophae salicifolia* D.Don
36	Chiraito	*Swertia chirayita*
37	Chulthe Amilo, Lek Batamle, Padamchal	*Rheum australe* D.Don
38	Chutro	*Berberis asiatica* Roxb. Ex DC.
39	Chyau	*Agaricus campestris*

S.N.	Total NTFP species	Scientific Name
40	Dalechuk, Tora	*Hippophae tibetana*
41	Dhakayo	*Arisaema speciosum* (Wall.) Mart. Ex Schott
42	Dhema	*Caragana versicolor* (Wall. Benth).
43	Dhupi (Kumkum)	*Didymocarpus abicalyx* C.B. Clarke
44	Eklevir	*Lobelia pyramidalis* Wall.
45	Ephedra	*Ephedra girardiana* Wall.
46	Gaikhure	*Tribulus terrestris* L.
47	Ghangaru	*Pyracantha crenulata* (D.Don) M. Roemer
48	Ghiukumari	*Aloe vera* (l.) Burm. F.
49	Githha, Bhyakur	*Dioscorea bulbifera* L.
50	Guchhichyaau	*Morchella esculenta*
51	Gudelo	*Elaeagnus parvifolia*
52	Gujargano	*Cissaempelos pareira* L.
53	Gulfa/Glpha	*Holboellia latifolia* Wall.
54	Gurjo	*Tinospora sinensis* (Lour.) Merr.
55	Guyeli	*Elaeagnus infundibularis*
56	Hadchur	*Viscum articulatum* Burm. F.
57	Hade Lasun	*Crinum amoenum* Roxb.
58	Halhale	*Rumex nepalensis* Spreng.
59	Hardjor, Panchaule	*Dactylorhiza hatagirea* (D. Don) Soo
60	Harro	*Terminalia chebula* Retz.
61	Honey bee	*Apis dorsatalaboriosa*
62	Indreni Lahara	*Citrullus colosynthis* Schred.
63	Jamanemandro	*Mahonia napaulensis* DC.
64	Jhulesalla	*Picea smithiana* (Wall.) Boiss.
65	Jibre sag	*Ophioglossum petiolatum*
66	Jimbu	*Allium hypsistum* Stearn.
67	Kafal	*Myrica esculenta* Buch.-Ham. Ex D.Don
68	Kanchirno	*Rhapidophora glauca*
69	Kantakari	*Solanum surratense* Burm. F.
70	Kaulo	*Machilus odoratissima*
71	Kaulo (Chiple)	*Machilus duthiei*
72	Kaulo (Lipe)	*Machilus eduis*
73	Khammari	*Gmelina arborea* Roxb.
74	Khiraunla	*Polygonatum verticillatum*
75	Khole Sag	*Rorippa nasturtium-aqualicum* (L.) Hayek
76	Kimmu	*Morus serrata* Roxb.
77	Kukur tarul	*Dioscorea alata* L.
78	Lakhuto	*Pteridium revolutum*
79	Laligurans	*Rhododendron arboreum* Smith
80	Lapsi	*Choerospondias axillaris* (Roxb.) B. L. Burtt & A. W. Hill

S.N.	Total NTFP species	Scientific Name
81	Lauth salla	*Taxus wallichiana*
82	Hade Unau	*Glechenia gigantean*
83	Lichen	*Usnea aciculifera*
84	Lokta	*Daphne bholua*
85	Maharangi	*Maharanga emodi* (Wall.) A. DC.
86	Maholo	*Viburnum mullaha* Buch.-Ham. ex D. Don
87	Majitho	*Rubia manjith*
88	Meconopsis	*Meconopsis sps*
89	Niguro	*Dryopteris cochleate*
90	Niuro	*Diplazium maximum*
91	Nundhiki	*Osyris Wightiana* Wall.
92	Okhar	*Juglans regia* L.
93	Pakhanbed	*Bergenia ciliata*
94	Palta	*Persea americana*
95	Pangay, Jatamansi	*Nardostachys jatamansi*
96	Pangra	*Entada phaseoloides*
97	Paniamala	*Nephrolepis auriculata*
98	Lekh sallo	*Pinus wallichaina* A.B. Jackson
99	Pipla	*Piper longum*
100	Pongar	*Aconitum gammiei*
101	Rhododendron Lepidotum	*Rhododendron Lepidotum* Wall.
102	Ral Tung (Bethe sag)	*Chenopodium album* L.
103	Rato chyau	*Lentinula sulphureus*
104	Rittha	*Sapindus mukorossi* Gaerth
105	Rosa Sp.	*Rosa sericea*
106	Rudhilo	*Pogostemon benghalensis* (Burm. F.) kuntze
107	Saldhup	*Shorea robusta Gaertn.*
108	Sanoabhijalo	*Drymaria cordata* (L.) Willd. ex Roem. & Schult
109	Satuwa	*Paris polyphylla*
110	Shikhari lahara	*Poranopsis paniculata*
111	Shilajit	*Asphaltum punjabianum*
112	Sigri Dhup, Dhupi	*Juniperus indica Bertol.*
113	Sil Timur	*Lindera neesiana*
114	Sil Timur	*Litsea cubeba*
115	Silinge	*Osmanthus fragrans*
116	Sinkauli	*Cinnamomum tamala* (Buch.-Ham.) Nees & Eberm.
117	Sisnu	*Urtica dioica L.*
118	Sugandhawal	*Valeriana jatamansi*
119	Sunakhari	*Orchids*
120	Sunpati	*Rhododendron anthopogon*

S.N.	Total NTFP species	Scientific Name
121	Titepati	*Artemisia indica*
122	Thakailo	*Cirsium falconeri* (Hook. F.) Petrak
123	Thosni	*Aconogum mobile* (D.Don) Hara
124	Thulokhati	*Astilbe rivularis*
125	Titepati	*Artemisia gmelinii*
126	Tite	*Thlapsi arvense* L.
127	Tusa	*Thamnocalamus spathiflorus*
128	Wild Strawberry	*Fragaria vesca* L.
129	Yarshagumba	*Cordyceps sinensis*
130	Kakoli	*Fritillaria cirrhosa*
131	Ban tarul	*Dioscorea hamiltonii*
132	Daaling dhup	*Dolomiaea macrocephala*
133	Dhakayo	*Arisaema griffithii*
134	Dhatelo	*Prinsepia utilis*
135	Gujargano	*Stephania gladulifera*
136	Khiraunla	*Polygonatum cirrhifolium*
137	Kurilo	*Asparagus officinalis*
138	Lek satuwa	*Trillium govanianum*
139	Nagbeli	*Lycopodium clavatum*
140	Nigalo	*Drepanostachyum falcatum*
141	Pipla	*Piper mullesua*
142	Talis patra	*Abies spectabilis*
143	Titepati	*Artemisia vestita*
144	Kurilo	*Asparagus racemosus*
145	Bhedekuro	*Barleria cristata L.*
146	Narka, Ganaune, Gharguri, Bakle Pat	*Viburnum cotinifolium* D.Don
147	Ghode Khari, Asara	*Viburnum cylindricum* Buch.-Ham. Ex D.Don
148	Bhakimlo	*Rhus javanica* (L.) Merr.
149	Rani bhalayoo	*Rhus succedanea* L.
150	Bucho Aushadhi	*Heracleum nepalense* D.Don
151	Aank	*Calotropis gigantea (*L.) W.T.Aiton
152	Kirro	*Holarrhena pubescens* (Buch.-Ham.) Wall. Ex G. Don
153	Dudhela	*Hedera nepalensis* K. Koch
154	Madar	*Panax pseudoginseng* Wall.
155	Chuletro	*Trevesia palmata* (Roxb. ex Lindl.) Vis.
156	Kalo banmara	*Ageratina adenophora* (Spreng.) R.M.King & H.Rob.
157	Gandhe Jhar	*Ageratum conyzoides* L.
158	Sahadeva	*Ainsliaea aptera* DC.
159	Buki Phool	*Anaphalis busua (Buch.-Ham.) DC.*
160	Buki Phool	*Anaphalis contorta (D. Don) Hook.f.*

S.N.	Total NTFP species	Scientific Name
161	Tine	*Arctium lappa* L.
162	Lugmik	*Aster indamellus* Grierson
163	Kalo kuro	*Bidens pilosa* L.
164	Thuk Jhar	*Caesulia axillaris* Roxb.
165	Thakal Kanta	*Cirsium wallichii* DC.
166	Anikale Jhar	*Crassocephalum crepidioides* (Benth.) S.Moore
167	Gadhihare	*Duhaldea cappa* (Buch.-Ham. ex D.Don) Pruski & Anderb.
168	Bhringiraj	*Eclipta prostrata* (L.) L.
169	Sahasra Buti	*Elephantopus scaber* L.
170	Chalune Jhar	*Emilia sonchifolia* (L.) DC.
171	Chittlange jhar	*Galinsoga parviflora* Cav.
172	Juse Til, Philinge	*Guizotia abyssinica* (L.f.) Cass.
173	Sooryamukhee	*Helianthus annuus* L.
174	Kapase phool	*Saussurea gossypiphora* D. Don
175	Sayapatri	*Tagetes erecta* L.
176	Tuki Phool	*Taraxacum sect. Taraxacum F.H.Wigg.*
177	Tiuri Jhar	*Impatiens scabrida* DC.
178	Kyerpa	*Berberis ceratophylla* G. Don
179	Chutro	*Berberis chitria* Buch.-Ham. ex Lindl.
180	Bahremaase Chutro	*Berberis wallichiana* DC.
181	Uttis, Giunsin	*Alnus nepalensis* D. Don
182	Saur, Chiyober	*Betula alnoides* Buch.-Ham. ex D.Don
183	Totala	*Oroxylum indicum* (L.) Kurz
184	Shalgam	*Brassica rapa* L.
185	Darya Ken	*Lepidium apetalum* Willd.
186	Ramsinghe, Dabdabe	*Garuga pinnata* Roxb.
187	Naagaphani/Paate Siundi	*Opuntia monacantha* Haw.
188	Khari	*Celtis australis* L.
189	Ban Karyaal/Mula Pat	*Dipsacus inermis* Wall.
190	Ban Chitu	*Euonymus hamiltonianus* Wall.
191	Mamire	*Parnassia nubicola* Wall. ex Royle
192	Amarlata, Aakash beli	*Cuscuta reflexa var. reflexa Roxb.*
193	Lahare saag	*Ipomoea muricata* (L.) Jacq.
194	Machhyano	*Coriaria nepalensis* Wallich
195	Kundruk, Golkankri	*Coccinia grandis* (L.) Voigt.
196	Indreni	*Trichosanthes tricuspidata* Lour.
197	Rakchan Chandan	*Daphniphyllum himalense* (Benth.) Müll.Arg
198	Phallu	*Cassiope fastigiata* (Wall.) D. Don
199	Angeri, Anjir, Jagguchal	*Lyonia ovalifolia* (Wall.) Drude
200	Bristly Rhododendron	*Rhododendron setosum* D. Don

S.N.	Total NTFP species	Scientific Name
201	Dudhe, Rato Maslahare	*Euphorbia hirta* L.
202	Lalupate	*Euphorbia pulcherrima* Willd. ex Klotzsch
203	Siund	*Euphorbia royleana* Boiss.
204	Godasilo	*Excoecaria acerifolia* Didr.
205	Sajwan/ Ratando	*Jatropha curcas* L
206	Maleto, Mallato	*Macaranga denticulata* (Blume) Müll.Arg.
207	Rohini, Sindure	*Mallotus philippensis* (Lam.) Mull. Arg.
208	Adil	*Ricinus communis* L.
209	Koiralo	*Bauhinia variegata* L.
210	Theki Kath	*Erythrina arborescens* Roxb.
211	Phaledo	*Erythrina stricta* Roxb.
212	Bhamase	*Flemingia strobilifera* (L.) W.T.Aiton
213	Bhattmas	*Glycine max* (L.) Merr.
214	Phusre Ghaans/ Miramre	*Indigofera cassioides* Rottler ex DC
215	Laijabati, Buhan	*Mimosa pudica* L.
216	Jangali Badame Jhar, Chemg Phool	*Parochetus communis* Buch.-Ham. ex D.Don
217	Bhoria, Boria	*Phanera vahlii* (Wight & Arn.) Benth.
218	Baralikunda Biralimendo	*Pueraria tuberosa* (Roxb. ex Willd.) DC.
219	Ashok	*Saraca asoca* (Roxb.) W.J.de Wilde
220	Dhale Katush	*Castanopsis indica* (Roxb. ex Lindl.) A.DC.
221	Masure Katush, Kasin	*Castanopsis tribuloides* (Sm.) A.DC.
222	Phalant, Ngasi	*Quercus lamellosa* Sm.
223	Karoo	*Gentiana Kurroo* Royle
224	Tikta	*Gentianopsis paludosa* (Hook.f.) Ma
225	Kalen	*Swertia ciliata* (D.Don) B.L.Burtt
226	Chunitro Ghans	*Geranium nepalense Sweet*
227	Raklamula	*Geranium wallichianum* D.Don ex Sweet
228	Paakhaan Bhittaa	*Didymocarpus aromaticus* D.Don
229	Bansuli/ Bhaasak	*Hydrangea febrifuga* (Lour.) Y.De Smet & Granados
230	Undalu/ Urilo	*Hypericum uralum* Buch.-Ham. ex D.Don
231	Ghoke ghans	*Ajuga macrosperma* Wall. ex Benth.
232	Raato Chaarapaate	*Anisomeles indica* (L.) Kuntze
233	Mas Gede	*Callicarpa arborea* Roxb.
234	Guenlo	*Callicarpa macrophylla* Vahl
235	Dhursule	*Colebrookea oppositifolia* Sm.
236	Atunametok	*Dracocephalum heterophyllum* Benth.
237	Kansta/ Jangli tulsi	*Elsholtzia blanda* (Benth.) Benth.
238	Ban Baawaari	*Elsholtzia strobilifera* (Benth.) Benth.

S.N.	Total NTFP species	Scientific Name
239	Phusure, Bhusure, ghurmiso	*Leucosceptrum canum* Sm.
240	Pinaase Jhar	*Micromeria biflora* (Buch.-Ham. ex D.Don) Benth.
241	Ramtulasi	*Origanum vulgare* L.
242	Gwalpani	*Salvia hians* Royle ex Benth.
243	Nilobutte ghans	*Scutellaria discolor* Wall. ex Benth.
244	Akheno	*Thymus linearis* Benth.
245	Dalchini, Kukhi Taj	*Cinnamomum verum* J.Presl
246	Kutmiro, Ratmati	*Litsea monopetala* (Roxb.) Pers.
247	Pyauli, Kyobi, Basanta	*Reinwardtia indica* Dumort.
248	Dhairo	*Woodfordia fruticosa* (L.) Kurz
249	Ban Kapas	*Azanza lampas* (Cav.) Alef.
250	Jhilimilipapa	*Oxyspora paniculata* DC.
251	Badahar	*Artocarpus lacucha* Buch.-Ham.
252	Kyunkaphal	*Morus alba* L.
253	Jamuna, Kalojamuna	*Syzygium cumini* (L.) Skeels
254	Dhukure	*Fumaria indica* (Hausskn.) Pugsley
255	Jhingana, Junsi	*Eurya acuminata* DC.
256	Gayo	*Bridelia retusa* (L.) A.Juss.
257	Jaringo Sag, Jarka	*Phytolacca acinosa* Roxb.
258	Hadohuro	*Peperomia tetraphylla* (G.Forst.) Hook. & Arn.
259	Isabgol	*Plantago major* L.
260	Chini Jhar	*Scoparia dulcis* L.
261	Luiche Phool,	*Polygala arillata* Buch.-Ham. ex D.Don
262	Ratnaulo	*Bistorta amplexicaulis* (D.Don) Greene
263	Bilaune, Ghonde	*Maesa chisia* D.Don
264	Banbhogate	*Myrsine africana* L.
265	Brisma, Atisingiya, Seto Bikh	*Aconitum ferox* Wall. ex Ser.
266	Atish	*Aconitum heterophyllum* Wall. ex Royle
267	Gobaree	*Aconitum lethale* Griff.
268	Junge Lahara	*Clematis montana* Buch.-Ham. ex DC.
269	Nak kore Jhar	*Ranunculus diffusus* DC.
270	Nak Kore	*Ranunculus sceleratus* L.
271	Dampate, Bansuli	*Thalictrum foliolosum* DC.
272	Bherakuro	*Agrimonia pilosa* Ledeb.
273	Kause Phool	*Cotoneaster affinis* Lindl.
274	Hatti Laharo	*Neillia thyrsiflora* D. Don
275	Khurpani	*Prunus armeniaca* L.
276	Painun, Chyakha	*Prunus cerasoides* Buch.-Ham. ex D.Don
277	Naspati	*Pyrus communis* L.
278	Mayal, Mel	*Pyrus pashia* Buch.-Ham. ex D.Don

S.N.	Total NTFP species	Scientific Name
279	Bhainse Kanda	*Rosa macrophylla* Lindl.
280	Kalo Ainselu	*Rubus niveus* Thunb.
281	Chyanguya	*Galium acutum* Edgew.
282	Dhobini	*Mussaenda roxburghii* Hook.f.
283	Ban Champa	*Spermadictyon suaveolens* Roxb.
284	Rato Kaginyo, Hyargo	*Wendlandia heynei* (Schult.) Santapau & Merchant
285	Bel	*Aegle marmelos* (L.) Corrêa
286	Dampate, Makhemaulo	*Boenninghausenia albiflora* (Hook.) Rchb. ex Meisn.
287	Nibuwa	*Citrus limon* (L.) Osbeck
288	Bimiro	*Citrus medica* L.
289	Bains	*Salix babylonica* L.
290	Pangre, Karu, Naru, Gyonprame	*Aesculus indica* (Wall. ex Cambess.) Hook.
291	Ondho, Tonsi	*Sauruia napaulensis* DC.
292	Thulo Pashan Bhed	*Bergenia stracheyi* (Hook.f. & Thomson) Engl.
293	Narayan Pati, Naprosar	*Buddleja asiatica* Lour.
294	Dhatura	*Brugmansia suaveolens* (Humb. & Bonpl. ex Willd.) Bercht. & J.Presl
295	Khursani	*Capsicum annuum* L.
296	Dhatura	*Datura stramonium* L.
297	Khursani Jwanu	*Hyoscyamus niger* L.
298	Surti, Kanchopat	*Nicotiana tabacum* L.
299	Jangali Mewa	*Physalis peruviana* L.
300	Kaligedi, Kalo Bihin	*Solanum americanum* Mill.
301	Kaligedi	*Solanum nigrum* L.
302	Kantakari	*Solanum virginianum* L.
303	Lodh	*Symplocos paniculata* (Thunb.) Miq.
304	Deuraali Phool	*Stellera chamaejasme* L.
305	Tusaare	*Debregeasia longifolia* (Burm.f.) Wedd.
306	Gagleto	*Elatostema sessile* J.R.Forst. & G.Forst.
307	Lipe/Seti Niche Saag	*Pouzolzia sanguinea* (Blume) Merr.
308	Simali	*Vitex negundo* L.
309	Baakhre Lahara	*Parthenocissus semicordata* (Wall.) Planch.
310	Reldonate	*Allium stracheyi* Baker
311	Banko	*Arisaema flavum* (Forssk.) Schott
312	Sarpako Makai	*Arisaema jacquemontii* Blume
313	Tribanka, Sarpako Makai	*Arisaema tortuosum* (Wall.) Schott
314	Ban Kurilo, Laudu	*Asparagus filicinus* Buch.-Ham. ex D.Don
315	Van Kasur	*Ophiopogon intermedius* D.Don
316	Kane Ghanse	*Commelina benghalensis* L.
317	Mothe, Chhaire	*Cyperus iria* L.

S.N.	Total NTFP species	Scientific Name
318	Kasur, Mothe	*Cyperus rotundus* L.
319	Sano Mothe	*Kyllinga brevifolia* Rottb.
320	Medicinal Yam/Elephant's foot	*Dioscorea deltoidea* Wall. ex Griseb.
321	Cowan Yam/ Five leaf Yam	*Dioscorea pentaphylla* L.
322	Ghiu Pat	*Cardiocrinum giganteum* (Wall.) Makino
323	Dakle Khar	*Apluda mutica* L.
324	Igari, Irnu, Phurki,Kharroki	*Arundinella nepalensis* Trin.
325	Jai	*Avena sativa* L.
326	Kuro	*Chrysopogon aciculatus* (Retz.) Trin.
327	Bans	*Dendrocalamus strictus* (Roxb.) Nees
328	Kush	*Desmostachya bipinnata* (L.) Stapf
329	Kode jhar, Bankande	*Eleusine indica* (L.) Gaertn.
330	Babiyo	*Eulaliopsis binata* (Retz.) C.E.Hubb.
331	Arthunge	*Heteropogon contortus* (L.) P.Beauv. ex Roem. & Schult.
332	Siru	*Imperata cylindrica* (L.) Raeusch.
333	Ginger Grass	*Paspalum distichum* L.
334	Jak, Narkat	*Phragmites karka (*Retz.) Trin. ex Steud.
335	Kalo Haiedo, Haiedo, Barkhe	*Curcuma angustifolia* Roxb.
336	Doopi	*Juniperus communis* L.
337	Dhoopi	*Juniperus recurva* Buch.-Ham. ex D.Don
338	Somlata	*Ephedra intermedia* Schrenk & C.A.Mey.
339	Rani Sallo	*Pinus roxburghii* Sarg.
340	Kalee Niuro	*Cyrtomium caryotideum* (Wall. ex Hook. & Grev.) C. Presl
341	Thulo Nyuro	*Polystichum squarrosum* (D. Don) Fée
342	Aankhle Jhar	*Equisetum arvense* L.
343	Janai Lahara	*Lygodium japonicum* (Thunb.) Sw.
344	Kane Sinka Pakhale Unyu	*Adiantum capillus*-veneris L.
345	Tinkhutte Sottar	*Pteris wallichiana* J. Agardh

Annex 6 – Prioritized NTFPs (plant, animal and mineral based) from ACA

S.N.	Local Name	Scientific Name	Remarks
1	Allo	*Girardinia diversifolia*	*Commercial*
2	Amala	*Phyllanthus emblica*	*Commercial*
3	Amriso	*Thysanolaena latifolia*	*Commercial*
4	Ban Lasun	*Allium wallichii*	*Non-commercial*
5	Ban Lasun, Kakoli	*Fritillaria cirrhosa*	*Commercial*
6	Ban tarul	*Dioscorea hamiltonii*	*Non-commercial*

S.N.	Local Name	Scientific Name	Remarks
7	Mithe tarul, Rani bhaykur	*Dioscorea pentaphylla*	*Non-commercial*
8	Banko, Bir banko	*Arisaema tortuosum*	*Non-commercial*
9	Bayajaro	*Smilax aspera*	*Non-commercial*
10	Bhojpatra	*Betula utilis*	*Non-commercial*
11	Bhuin chuk	*Hippophae tibetana*	*Commercial*
12	Bhuletro, Bhujetro	*Butea minor*	*Non-commercial*
13	Bhutkesh	*Selinum wallichianum*	*Commercial*
14	Bikh	*Aconitum spicatum*	*Commercial*
15	Bish jharne	*Arisaema speciosum*	*Non-commercial*
16	Bojho	*Acorus calamus*	*Non-commercial*
17	Chillo batulpate	*Cissampelos pareira*	*Non-commercial*
18	Chiple	*Boehmeria sp*	*Commercial*
19	Chiraito	*Swertia chirayita*	*Commercial*
20	Chutro	*Berberis asiatica*	*Non-commercial*
21	Chutro	*Berberis aristata*	*Non-commercial*
22	Chyau	*Ganoderma sp.*	*Commercial*
23	Daaling dhup	*Dolomiaea macrocephala*	*Non-commercial*
24	Dale chuk	*Hippophae salicifolia*	*Commercial*
25	Dhakayo saag	*Arisaema griffithii*	*Non-commercial*
26	Dhatelo	*Prinsepia utilis*	*Non-commercial*
27	Dhupi	*Juniperus indica*	*Commercial*
28	Ganja	*Cannabis sativa*	*Non-commercial*
29	Ghodtapre	*Centella asiatica*	*Non-commercial*
30	Gittha	*Dioscorea sp.*	*Non-commercial*
31	Gujargano	*Stephania glandulifera*	*Non-commercial*
32	Gurjo	*Tinospora cordifolia*	*Commercial*
33	Guyeli	*Elaeagnus infundibularis*	*Non-commercial*
34	Guyeli	*Elaeagnus umbellate*	*Non-commercial*
35	Halhale	*Rumex nepalensis*	*Non-commercial*
36	Indreni	*Trichosanthes tricuspidata*	*Non-commercial*
37	Jatamansi	*Nardostachys jatamansi**	*Commercial*
38	Jhyau	*Lichen sp**	*Non-commercial*
39	Jimbu	*Allium hypsistum*	*Commercial*
40	Kafal	*Myrica esculenta*	*Commercial*
41	Chiple Kaulo	*Machilus duthiei*	*Commercial*
42	Kaulo	*Machilus odoratissima*	*Non-commercial*
43	Khiramlo	*Polygonatum verticillatum*	*Non-commercial*
44	Khiraunla	*Polygonatum cirrrhifolium*	*Commercial*
45	Kurilo	*Asparagus racemosus*	*Commercial*
46	Kurilo	*Asparagus officinalis*	*Commercial*
47	Kutki	*Neopicrorhiza scrophulariiflora**	*Commercial*
48	Lauth salla	*Taxus wallichiana**	*Commercial*
49	Lek satuwa	*Trillium govanianum*	*Commercial*
50	Lokta	*Daphne bholua*	*Commercial*

S.N.	Local Name	Scientific Name	Remarks
51	Maharangi	*Maharangi emodi*	*Non-commercial*
52	Majjitho	*Rubia manjith*	*Commercial*
53	Nagbeli	*Lycopodium clavatum*	*Non-commercial*
54	Nigalo, Diu nigalo, Ghode nigalo	*Drepanostachyum falcatum*	*Commercial*
55	Nigalo, Rato nigalo	*Thamnocalamus spathiflorus*	*Commercial*
56	Nirmasi	*Delphinium denudatum*	*Commercial*
57	Nyuro	*Diplazium maximum*	*Commercial*
58	Nyuro	*Dryopteris cochleate*	*Commercial*
59	Nyuro	*Matteuccia struthiopteris*	*Commercial*
60	Padamchal	*Rheum australe*	*Commercial*
61	Pahelo ainselu	*Rubus ellipticus*	*Commercial*
62	Pakhanbed	*Bergenia ciliata*	*Commercial*
63	Panchaule	*Dactylorhiza hatagirea**	*Commercial*
64	Pahadi pan, Hill pepper	*Piper mullesua*	*Commercial*
65	Pipla, Gaj pipla	*Piper longum*	*Commercial*
66	Pongar	*Aconitum gammiei*	*Commercial*
67	Raltung, Bethe sag	*Chenopodium album*	*Non-commercial*
68	Rato Chyau	*Lentinula sulphureus*	*Commercial*
69	Chyau	*Ganoderma lucidum*	*Commercial*
70	Rose	*Rosa sericea*	*Non-commercial*
71	Satuwa	*Paris polyphylla*	*Commercial*
72	Siltimur	*Litsea cubeba*	*Commercial*
73	Siltimur	*Lindera neesiana*	*Commercial*
74	Sisnu	*Urtica dioica*	*Commercial*
75	Somlata	*Ephedra gerardiana*	*Non-commercial*
76	Sughandawal	*Valeriana jatamansi*	*Commercial*
77	Sunpati	*Rhododendron anthopogon*	*Commercial*
78	Talis patra	*Abies spectabilis**	*Non-commercial*
79	Tejpat	*Cinnamomum tamala*	*Commercial*
80	Thulo okhati	*Astilbe rivularis*	*Non-commercial*
81	Timur	*Zanthoxylum armatum*	*Commercial*
82	Titepati	*Artemisia indica*	*Non-commercial*
83	Titepati	*Artemisia vestita*	*Non-commercial*
84	Yarshagumba	*Cordyceps sinensis*	*Commercial*

Annex 7: Prioritized NTFPs with their potential habitat area and average sustainable amount to harvest in ACA

S.N.	Local Name	Scientific Name	Category of NTFPs	Potential habitat area(ha)	Sustainable Amount to harvest Amt. (Wet Wt. kg/ha)	Total sustainable harvest amount (Wet Wt. kg)	Allowable harvest amount (Wet Wt. kg)
1	Allo	*Girardinia diversifolia*	*Commercial*	32,797	44	1,439,787	43,194
2	Amala	*Phyllanthus emblica*	*Commercial*	1,357	7	9,719	1,458
3	Amriso	*Thysanolaena latifolia*	*Commercial*	2,302	34	77,946	7,795
4	Ban Lasun	*Allium wallichii*	*Non-commercial*	19,419	1	13,205	13,205
5	Ban Lasun, Kakoli	*Fritillaria cirrhosa*	*Non-commercial*	28,412	3	88,020	30,807
6	Ban tarul	*Dioscorea hamiltonii*	*Non-commercial*	5,214	33	169,774	16,977
7	Mithe tarul, Rani bhaykur	*Dioscorea pentaphylla*	*Non-commercial*	79	34	2,676	535
8	Banko, Bir banko	*Arisaema tortuosum*	*Non-commercial*	1,679	77	129,336	12,934
9	Bayajaro	*Smilax aspera*	*Non-commercial*	353	2	695	348
10	Bhojpatra	*Betula utilis*	*Non-commercial*	405	12	4,822	482
11	Bhuin chuk	*Hippophae tibetana*	*Commercial*	18,338	3	48,266	9,653
12	Bhuletro, Bhujetro	*Butea minor*	*Non-commercial*	783	11	8,614	861
13	Bhutkesh	*Selinum wallichianum*	*Commercial*	1,200	3	3,144	943
14	Bikh	*Aconitum spicatum*	*Commercial*	11,856	2	27,244	5,449
15	Bish jharne	*Arisaema speciosum*	*Non-commercial*	20,625	53	1,097,648	43,906
16	Bojho	*Acorus calamus*	*Non-commercial*	940	2	1,810	271
17	Chillo batulpate	*Cissampelos pareira*	*Non-commercial*	183	20	3,676	368
18	Chiple	*Boehmeria sp*	*Commercial*	116	1	120	120

S.N.	Local Name	Scientific Name	Category of NTFPs	Potential habitat area(ha)	Sustainable Amount to harvest Amt. (Wet Wt. kg/ha)	Total sustainable harvest amount (Wet Wt. kg)	Allowable harvest amount (Wet Wt. kg)
19	Chiraito	*Swertia chirayita*	*Commercial*	23,367	20	466,413	41,977
20	Chutro	*Berberis asiatica*	*Non-commercial*	2,689	23	61,986	6,199
21	Chutro	*Berberis aristata*	*Non-commercial*	16,685	11	188,712	7,548
22	Chyau	*Ganoderma sp.*	*Commercial*	2,470	7	17,095	855
23	Daaling dhup	*Dolomiaea macrocephala*	*Non-commercial*	1,127	3	3,595	359
24	Dale chuk	*Hippophae salicifolia*	*Commercial*	7,877	23	180,612	18,061
25	Dhakayo saag	*Arisaema griffithii*	*Non-commercial*	6,149	12	71,147	7,115
26	Dhatelo	*Prinsepia utilis*	*Non-commercial*	6,734	18	118,659	11,866
27	Dhupi	*Juniperus indica*	*Commercial*	19,980	33	665,130	16,628
28	Ganja	*Cannabis sativa*	*Non-commercial*	64	10	624	94
29	Ghodtapre	*Centella asiatica*	*Non-commercial*	64	8	490	98
30	Gittha	*Dioscorea sp.*	*Non-commercial*	783	19	14,487	1,449
31	Gujargano	*Stephania glandulifera*	*Non-commercial*	2,254	7	15,483	1,548
32	Gurjo	*Tinospora cordifolia*	*Commercial*	2,427	43	104,746	10,475
33	Guyeli	*Elaeagnus infundibularis*	*Non-commercial*	157	3	472	472
34	Guyeli	*Elaeagnus umbellata*	*Non-commercial*	1,050	20	20,595	2,059
35	Halhale	*Rumex nepalensis*	*Non-commercial*	10,473	40	415,766	4,158
36	Indreni	*Trichosanthes tricuspidata*	*Non-commercial*	2,510	5	11,698	2,340
37	Jatamansi	*Nardostachys jatamansi**	*Commercial*	31,572	4	123,448	12,345
38	Jhyau	*Lichen sp**	*Non-commercial*	834	2	1,395	139
39	Jimbu	*Allium hypsistum*	*Commercial*	9,465	3	31,801	7,950
40	Kafal	*Myrica esculenta*	*Commercial*	9,874	11	112,756	11,276

S.N.	Local Name	Scientific Name	Category of NTFPs	Potential habitat area(ha)	Sustainable Amount to harvest Amt. (Wet Wt. kg/ha)	Total sustainable harvest amount (Wet Wt. kg)	Allowable harvest amount (Wet Wt. kg)
41	Chiple Kaulo	*Machilus duthiei*	*Commercial*	2,376	7	15,603	1,560
42	Kaulo	*Machilus odoratissima*	*Non-commercial*	2,025	10	19,948	1,995
43	Khiramlo	*Polygonatum verticillatum*	*Non-commercial*	826	50	41,275	6,191
44	Khiraunla	*Polygonatum cirrrhifolium*	*Non-commercial*	19,245	5	93,529	14,029
45	Kurilo	*Asparagus racemosus*	*Commercial*	26,009	17	442,673	44,267
46	Kurilo	*Asparagus officinalis*	*Commercial*	2,618	30	79,387	4,763
47	Kutki	*Neopicrorhiza scrophulariiflora**	*Commercial*	60,134	3	202,051	8,082
48	Lauth salla	*Taxus wallichiana**	*Commercial*	27,195	28	774,798	19,370
49	Lek satuwa	*Trillium govanianum*	*Commercial*	312	1	190	190
50	Lokta	*Daphne bholua*	*Commercial*	40,708	27	1,117,058	37,980
51	Maharangi	*Maharangi emodi*	*Non-commercial*	8,380	34	287,350	5,747
52	Majjitho	*Rubia manjith*	*Commercial*	5,287	31	162,519	16,252
53	Nagbeli	*Lycopodium clavatum*	*Non-commercial*	4,037	31	123,809	3,714
54	Nigalo, Diu nigalo, Ghode nigalo	*Drepanostachyum falcatum*	*Commercial*	25,867	22	569,270	102,469
55	Nigalo, Rato nigalo	*Thamnocalamus spathiflorus*	*Commercial*	52,323	98	5,153,243	103,065
56	Nirmasi	*Delphinium denudatum*	*Commercial*	57,094	3	144,447	10,834
57	Nyuro	*Diplazium maximum*	*Commercial*	11,411	32	362,188	18,109
58	Nyuro	*Dryopteris cochleata*	*Commercial*	20,451	1,061	21,701,692	21,702
59	Nyuro	*Matteuccia struthiopteris*	*Commercial*	987	8	7,500	1,500

S.N.	Local Name	Scientific Name	Category of NTFPs	Potential habitat area(ha)	Sustainable Amount to harvest Amt. (Wet Wt. kg/ha)	Total sustainable harvest amount (Wet Wt. kg)	Allowable harvest amount (Wet Wt. kg)
60	Padamchal	*Rheum australe*	*Commercial*	39,013	7	263,336	13,167
61	Pahelo ainselu	*Rubus ellipticus*	*Commercial*	7,721	29	224,626	11,231
62	Pakhanbed	*Bergenia ciliata*	*Commercial*	5,516	13	71,160	3,558
63	Panchaule	*Dactylorhiza hatagirea**	*Commercial*	3,298	1	4,189	419
64	Pahadi pan, Hill pepper	*Piper mullesua*	*Commercial*	2,952	10	29,699	1,188
65	Pipla, Gaj pipla	*Piper longum*	*Commercial*	270	3	675	473
66	Pongar	*Aconitum gammiei*	*Commercial*	1,566	1	2,176	435
67	Raltung, Bethe sag	*Chenopodium album*	*Non-commercial*	54	16	885	106
68	Rato Chyau	*Lentinula sulphureus*	*Commercial*	2,593	11	28,830	1,153
69	Chyau	*Ganoderma lucidum*	*Commercial*	2,524	6	15,651	1,565
70	Rose	*Rosa sericea*	*Non-commercial*	2,913	2	4,370	437
71	Satuwa	*Paris polyphylla*	*Commercial*	46,977	19	900,551	18,011
72	Siltimur	*Litsea cubeba*	*Commercial*	632	4	2,331	233
73	Siltimur	*Lindera neesiana*	*Commercial*	5,446	22	121,944	6,097
74	Sisnu	*Urtica dioica*	*Commercial*	21,720	32	690,265	6,903
75	Somlata	*Ephedra gerardiana*	*Non-commercial*	4,990	3	12,625	1,136
76	Sughandawal	*Valeriana jatamansi*	*Commercial*	1,118	1	1,514	1,060
77	Sunpati	*Rhododendron anthopogon*	*Commercial*	63,558	Flower=0.18	11,440	2,288
					Leaf = 7.06	448,716	13,461
78	Talis patra	*Abies spectabilis**	*Non-commercial*	875	6	4,979	2,489
79	Tejpat	*Cinnamomum tamala*	*Commercial*	5,814	Bark-8.844	51,416	2,571
					Leaves-41.99	244,113	17,088

S.N.	Local Name	Scientific Name	Category of NTFPs	Potential habitat area(ha)	Sustainable Amount to harvest Amt. (Wet Wt. kg/ha)	Total sustainable harvest amount (Wet Wt. kg)	Allowable harvest amount (Wet Wt. kg)
80	Thulo okhati	*Astilbe rivularis*	*Non-commercial*	3,444	3	9,851	985
81	Timur	*Zanthoxylum armatum*	*Commercial*	10,651	20	208,751	8,350
82	Titepati	*Artemisia indica*	*Non-commercial*	22,695	113	2,557,244	102,290
83	Titepati	*Artemisia vestita*	*Non-commercial*	22,935	2	40,137	12,041
84	Yarshagumba	*Cordyceps sinensis*	*Commercial*	70,016	0	3,431	961
Total Harvest Amount				**1,021,238**		**43,007,047**	**1,005,832**

Annex 8: Remodeled political division and demographic data of ACA

S.N.	Districts	Rural Municipalities	Total population	Male	Female	Total households	HH%	Sex ratio	Population density
1	Kaski	Annapurna RM	22,099	48.4	51.6	6049	18.98	93.63	53
		Machhapuchhre RM	22,898	48.8	51.2	6151	19.30	95.29	42
		Madi RM	16,142	49.7	50.3	4094	12.84	98.6	29
	Lamjung	Kwhola RM	7,960	48.3	51.7	2,276	7.14	93.25	45
		Marshyangdi RM	17,080	48.8	51.2	4,550	14.28	95.2	29
	Manang	Manang Ngisyang RM	1595	51.7	48.3	561	1.76	106.87	2
		Narpa Bhumi RM	396	42.7	57.3	126	0.40	74.45	0
		Chame RM	1276	57.2	42.8	389	1.22	133.7	0
		Nason RM	1671	49.6	50.4	471	1.48	98.22	2
	Mustang	Lomanthang RM	1430	45	55	488	1.53	81.7	2
		Lo Ghekhar Damodarkunda RM	1292	47.1	52.9	488	1.53	89.17	1
		Varagung Muktichhetra RM	2036	49.9	50.1	723	2.27	99.41	2
		Gharpajhong RM	3712	52.3	47.7	1127	3.54	109.84	12
		Thasang RM	2856	50.9	49.1	832	2.61	103.71	10
	Myagdi	Annapurna RM	12,323	49.4	50.6	3600	11.29	97.58	22
Total			114,766	49.32	50.68	31873			

PHOTOPLATES OF FIELD ASSESSMENT

Taking Sample plot for the survey

Weighing the weight of NTFP

Collecting sample of NTFPs

Chulthe Amilo NTFPs observed

Observed NTFps during field work

Satuwa observed during field work

Taking Sample Plot in Kumle Forest area of CAMC Jomosom of UCO Jomsom

Taking weight of fresh Taxus wallichiana

Taking Sample plot of Sunpati

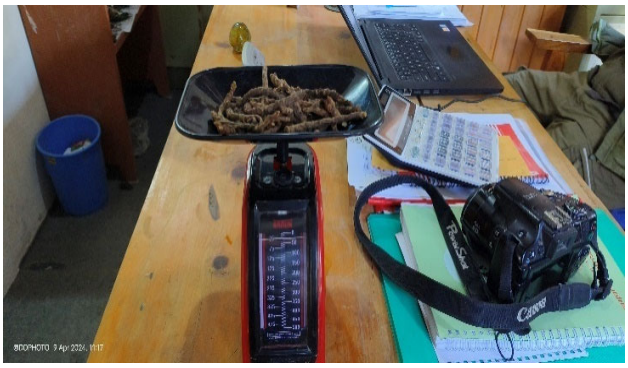
Taking weight of fresh Padamchaal

Taking weight of fresh root of Khiraula

Collecting sample of Lokata at CAMC Kobang

Taking fresh bark sample of Chutro for weighing

Observing Kutki for collecting sample



Taking dry weight of Kutki

Discussed with CAMC Srukang before field work

Discussed with CAMC Chhoser before field work

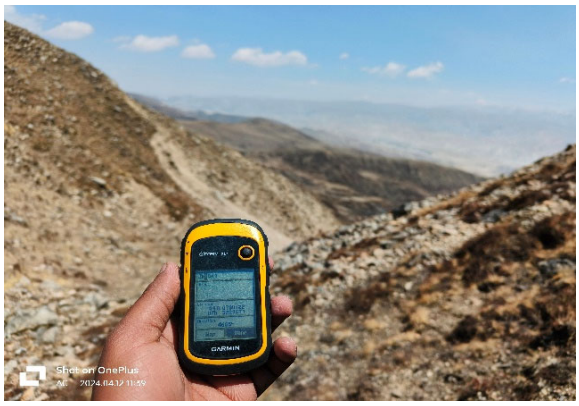
Discussed with LRP in Lomanthang

Focus group discussion before field work

Interviewed with kye person before field work

Taking weight of NTFPs in field work

Taking sample plot for the field work in Lomanthang



Taking GPS location of Sample plot

Taking sample plot in the field work in Sikles

Weighing of stem of NTFPs in the field a

Taking weight of sample during field work

Taking weight of sample during field work