A Report On Study of Jhula(Lichens), its extraction method and Trade system in Champawat district (Uttarakhand)

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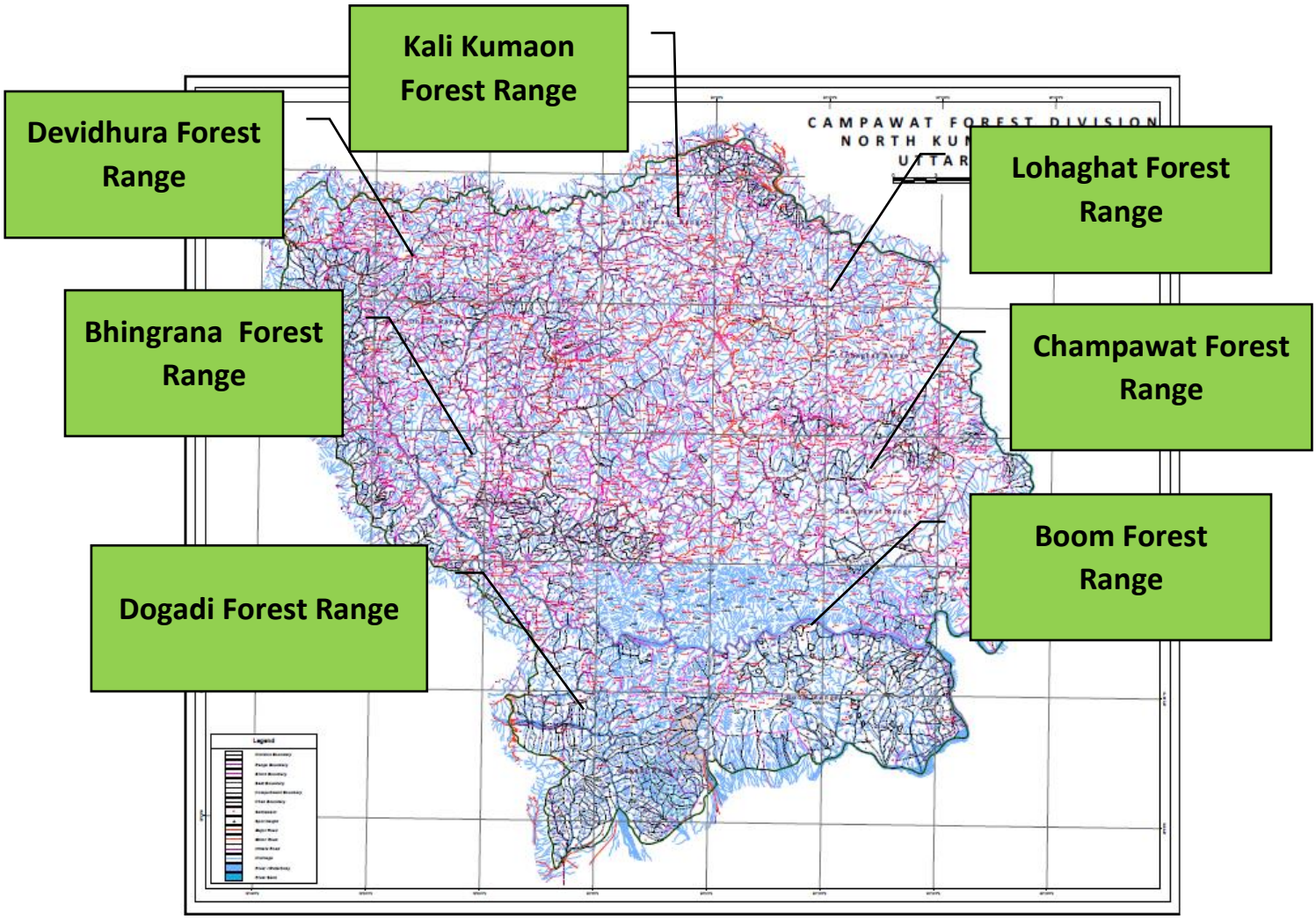
Introduction- This report is based on the study of Jhula (Lichen) extraction and its effect on extraction sites at Champawat district. The word Jhula is jointly used by the people of Uttarkhand for various Fruticose and Foliose Lichen species. Except Jhula the lichens are also known as Patthar Phool or stone flower in Uttarakhand. In the past year Jhula were collected in a large amount from all over the Uttarakhand. The collection of Jhula generally constitute Species of *Parmotrema, Everniastrum, Usnea, Ramalina, Bulbothrix, Heterodermia and Physia* etc genera. As More than Half of the population of Uttarakhand leaves in the rural areas of Uttarakhand and dependent on surrounding forest for its living. Jhula(Lichen) is an important Non-wood forest produce. It consists two unrelated organisms, a fungus and an alga growing in symbiotic relationship. A number of tree species such as *Querecus leucotricophora, Quercus floribunda, Rhododendron arboreum, Lyonia ovalifolia, Myrica esculenta, Pinus roxburghii, Cedrus deodara and Alnus nepalensis* trees growing in moist, shady and open areas of subtropical and temperate regions of the study areas provides suitable substrate to various lichen forms to grow on them. Various rocks and boulders also provides suitable substrate for the growth of lichens in these areas of study sites.

Study area- This study was conducted in the Champawat Forest Divison area to check the extraction and trade pattern of lichens and its effect on the extraction sites. The Champawat Forest Divison area falls under $29^0$1'.00"to $29^0$38'.00" N and $79^0$44'00E to $80^0$19'00" E. It has 7 Ranges viz. Devidhura Range, Bhingrana Range, Kali Kumaon Range, Lohaghat Range, Champawat Range, Boom Range, Dogadi Range. On the basis of extraction amount and area of Oak dominated forest Devidhura range, Champawat Range, Lohaghat range, Bhingrana range and Kali kumaon Range are respectively some of the major ranges. The study was conducted in various parts and areas of the four major ranges of Champawat forest divison. These ranges are Devidhura forest Range, Bhingrana Forest Range, Champawat Forest Range and Lohaghat Forest Range. Wide Oak dominated forest areas are surveyed to check the effect of extraction on Oak tree vegetation. All the studied area is varied from 1400-2100 mt altitude.

Name of the forest Range	Heavily extracted areas	Studied areas
Devidhura Forest Range	Devguru(Comes under Nainital district), Dainsli, Bhnola, Mornola (Comes under the boundries of Nainital and Almora district), Narsinghdanda, Kalukhan, Bhtoliya and some major chir pine area.	Devguru, Bhnola, Devidhura and its surrounding Chir pine areas.

Bhingrana Forest Range	Ladhol dhura area, Noliyagaon, Bhingrana and its surrounding area.	Ladhol dhura forest site
Lohaghat Forest Range	Mayawati, Fernhill top, Pancheshwar and its surrounding area.	Mayawati, Jhuma, Fernhill top.
Champawat Forest Range	Kranteshwar, Hingla devi forest area and Banlekh area.	Kranteshwar, Hingla devi forest area



Map of study area

Materials and Methodology- A survey based study was conducted in various Oak dominated areas of Devidhura, Bhingrana, Lohaghat and Champawat forest Range to check the effect of Jhula extraction on the vegetation of these area. The field based study was done with the help of various forest officials and local people. A general formal questionnaire method with various villagers and contractors of the adjacent sites of extraction areas was obtained to get the information about the extraction method, trading pattern, benefits from the sale of Jhula etc.

Results and Discussion- In all these studied area mix species of *Parmotrema*, *Usnea*, *Ramalina*, *Everniastrum*, *Heterodermia*, *Physia*, *Punctilia*, *Parmelia and Lapraria* genera and some crustose lichens were found widely. Well growth of lichens was found in young and middle age trees of Q. lecucotrichophora except the old age trees. Because the most of the old age trees were covered with the mosses.
















Various lichens(Jhula) growing on Study areas

- **The Extraction Method-** As local people have no idea about the use of these lichens they generally collect all species in bulk from all over the forest. The collection of lichen is generally done by putting up the fallen lichens, by climbing on the trees of *Querecus, Rhododendron Etc* by scrapping the outer most bark of the trees with the help of Sickle or Knife, by scrapping the surface of big boulders and rocks. As they don't have the idea about the Reserved forest boundaries or Van panchayat forest Boundaries so they collect the lichens from all over the nearest forest area from their villages. General way of people to identify the lichens is based on the Colour and thallus structure of lichen. According to their observation the white or grey colour thallus lichen are Majorly found in Chir pine forest whereas the green colour lichens are found in Banj oak forest. Scientifically these changes in colour are based on the variation on temperature and presence of Humidity in both kind of forest. Their criteria to check quality is simply based on the size of the thallus, according to their observation the lichens with big thallus are good. Scientifically this phenomenon is based on the growth speed of lichens. The extraction season is generally from December to February. Forest department on a rotational manner opens up a specific area for extraction of lichen and then Government allows these ranges or areas to the various agencies like Bheshaj Sangh/ KMVN to collect the extracted material from this area.

- **The collection Method-** The whole extracted material is collected by the local agents or contractors generally appointed or registered by the Jila bheshaj Sangh, Kumaon mandal Vikas Nigam or Forest Development corporation. Bheshaj sangh is a wide firm involve in this system. A pass or registration certificate is allotted to the collector after their registration. An agent or collector generally buy the material from the local villagers from 30-40 Rs/Kg to 110-120 Rs/Kg. the variation on price depend on the competition between the contractor. An area where the local contractor or agent are one or two in numbers in such areas people gets lower prices for their collected material. Whereas the areas having more than two contractors gives higher prices for the collected material to the local people due the competition in between them. *Parmotrema, Usnea, Ramalina and Everniastrum* are major genera which are highly extracted from the extraction sites.

- **The Trade and Transit system-** The Transportation and trade of material is started from base to top level. Lichen are collected from the forest by the villagers (most of the time they also collect Mosses according to market demand) after that they sales their collected product to the local traders/Contractor/Agents which are appointed and registered by the District Bhesaj Sangh. sometimes KMVN, Forest Development Corporation or Vanpanchayats also gives the registration to their agents. The Agents collects all material from their villagers and from surrounding area villagers.

  After that they have to pay a royalty to the Forest Department in the related Forest Range offices of that area. Generally, royalty is taken up on the basis of total bulk weight of both Lichens and Moss. After taking royalty the permission to transport the material from ranges to Mandis of Tanakpur and Haldwani is issued by the range officers to the agents or traders. Then the agents transport all collected material to the Mandis. As these Mandis are under the control of Uttarakhand Forest development corporation it conducts

the auction in these Mandis and Payment is made to the related agency or agents after selling the material. Around 1% amount of total Money obtained by the agency or agents during the auction by selling its material is deducted by the Forest development corporation as maintenance or handling charges. Then the agent of Bheshaj Sangh have to pay 10% of the total obtained money to the Bheshaj Sangh. Generally, these agents or agency directly or indirectly contacts through their links with the participating firms on auction to check the current price value of the deposited material.

As the information of auction is circulated through Newspaper or other medium so various local and outsider Grocer or trafficker(Baniya) takes participate in the auction. Finally, they send all material to the agencies according to their terms and connections throughout the India. In between this whole pattern of extraction to final transportation there is no any kind of grading system, it may be due to lack of knowledge of special content on these lichens or it is also not easy for a bulk of amount of lichens or may be due to consumption of time and wastage of material. Whatever it is but finally they get benefits from this valuable Non timber forest Produce.

- **Effect of extraction on economy of People-** As most of the population of Uttarakhand leaves in the hilly areas Non timber forest produce from the forest are the additional source for the peoples of these area to enhance their economy. According to local villagers a single big size bag (locally called bda ktta or bori) of lichens has a weight of around 20-25 kg or more around 30 kg if it is tightly packed. They get around 40-105 Rs/Kg price for their collected material. The price is generally depending on area to area/ agents to agents/ competition between the agents and also on the demand of the material. It is difficult for a single person to collects such amount of material so generally 2-3 person's sales their material jointly. A single person can collect as much as around 20 kg of lichens because lichens are very light weighted. A single local trader collects around 25-35 quintal material from the extraction site and pays around 300-350 Rs/Quintal to Forest department as a royalty for transit of the material to the mandis. The number of local traders varies according to the range areas which is opened up for this year as extraction purpose. Where the area is wide (eg. Devidhura range) the number of local traders or agents are more and local village peoples have more chances to get well value return for their material due to the competition in between the Agents. whereas if the extraction area is small (e.g. Lohaghat Range) local villagers have less chances to get well value of money return for their material due to limited number of agents and less competition in between them.

  ***an estimation of money obtained by the various persons or agencies involve in the trade and extraction of Jhula ghass on the basis of survey study: -**

- A single village person who have 20 kg material gets the price=20*40=**800**
  (approximate minimum when the price is around 40 rs/kg provided by the local traders)
  =20*105=**2100** (approximate Maximum when the price is around 120 rs/kg provided by the local traders)
- How much a single Agent gets-
  Suppose He or she has a material of around 25 Quintal
  And the price obtained by him or her is around 140 rs per kg so the obtained price will be=2500*140= **350000-7500**(royalty to the forest department@300 rs/Quintal)-**262500**(provided by the agents to the local villagers@105 Rs/Kg at an approx. constant rate)-**3500**(1% of total amount obtained by the agent

during the auction for maintenance or handling to the forest development corporation)-**35000**(10% of total amount obtained by the agent during the auction for maintenance or handling to Bheshaj sangh)-**5000** (approximate transportation charges)=**34500** Rupees pure.

- **The trade system-** Mostly the trade of the material is done on legal basis but sometimes it seems to be illegally traded during the transportation from ranges to Mandis. Except forest corporation mandis agents sometimes directly sale their material to some private firms to get higher benefits. Most of the material from Champawat range and Lohaghat Range transfers to the Tanakpur mandi whereas the material from Devidhura and Bhingrana range transfers to both Tanakpur and Haldwani Mandi, depends on price and distance.

- **Effact of Jhula extraction on forest vegetation-** Jhula or lichen is mostly extracted from the all over the forest mainly from Banj oak forest and sometimes from Chir pine trees, boulders and rocks. General method which is applied to remove the material from trees is scraping from the outermost surface of the trees. It does not provide much harmful effect on trees. But sometimes when some new extractor applies this method they can be provide harm to trees due to lack of experience. As the sites are opened up on rotational basis so it provides a protection to the forest. As local people have no idea about the biology of lichens and their growing speed so now they are feeling that bigger size lichens are less in the areas. Scientifically it is based on the growth rate of lichens which is very slow. On all extraction sites the interesting thing is that the overaged or old trees have lesser lichen colonies whereas young trees and new shrubs have higher numbers of species. At past time the *Pyrus pashia and* other *Pyrus sp.(Mehal) tree* was the best choice for extractor to collect the lichens as their structure provides favourable condition to colonize more lichen species but now day by day due to the reduction in the numbers of these trees Oak trees are the best choice for the people to collect the lichens. As Oak forest provides the favourable condition like Humidity, shade and temperature so these forest have a wide amount of lichens. As peoples are not only depending on these NTFPs so they also cut the trees for fodder and fuelwood (especially Oak) so it may be harmful if it occurs unsustainably.

Marks of extracted surface area through scrapping on trees

Conclusion- On the basis of survey into the extraction sites and interaction with various peoples related with this extraction trend of this valuable NTFPs the study concludes that there is not as much harm to the forest vegetation due to the extraction of the Jhula or lichens. The overall study area is having a very rich biodiversity. Natural regeneration in all valuable species like Oak, Burans, Kaphal and also in Chir is very low in these areas. All the studied areas have varied amount of lichen species. There is only a need to maintain sustainability concept during the cutting, lopping of trees for fodder and fuelwood purposes.