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### Entrepreneurial aspects of *Rhododendron* products in Uttarakhand regions: A review

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#### Abstract

Buransh is a perennial tree that is especially found in hilly areas. Buransh is hard to grow commercially because it is only found in the hilly regions of Uttarakhand, Sikkim, and the northeastern states of India. These trees are the center of attraction in the region due to their different flower color and these flowers are utilized to prepare natural colors and value-added products like juice, squash, etc. It has also been observed in many researches that various products are made using the flowers and bark of this tree which help to cure several diseases. Hilly areas have limited sources of income because of several natural and climatic challenges faced by residing people including uncertain rainfall, and snowfall which creates limitations for livelihood. Because of its potential for economic growth and development of the rural sector within the hill region, Buransh might be an environmentally sustainable approach to empower women as a source of income residing therein. The cultivation practices of Buransh fulfill the aims of the task force constituted by the Planning Commission of India in 2008, which ensured towards protection of peculiarities of hilly regions and maintaining the balance between natural resources with the parallel developmental aspirations of local peoples. The processing of buransh mostly involves no alteration in the natural environment, as well as making of its products does not have any external costs. In this review, we will discuss the various uses of buransh in a way of entrepreneurship and women empowerment.

**Keywords:** Buransh, entrepreneurship, forestry, value addition, empowerment, livelihood

#### Introduction

The *Rhododendron* is an evergreen tree that can reach a height of 20 meters. Its bark is rough and pinkish-brown, and its leaves have unique characteristics such as color, texture, and hardness. The Greek words “rhodo”, which means “rose”, and “dendron”, which means “tree”, are combined to form the phrase “rhododendron”, which means “rose tree” (Hora, 1981)<sup>[13]</sup>. Almost for 100 million years, a basic genus of blooming plants known as rhododendrons have thrived in the temperate zones of the northern hemisphere (de Milleville, 2002)<sup>[22]</sup>. This genus is primarily found at higher elevations around the equator, and several of its species are now highly significant both ecologically and economically (Mao *et al.*, 2001)<sup>[19]</sup>.

The height of a species varies from 2.5 cm (1 inch) for alpine plants to 30m (98 ft) for trees that are either deciduous, semi-deciduous, or evergreen (Hora, 1981)<sup>[13]</sup>. The blooming of rhododendron flowers takes place from late winter till early summer. The Himalayan region, which includes China, India, Nepal, Bhutan, and Pakistan, is the major area covering these trees. *Rhododendron* is the State tree of Sikkim (*Rhododendron niveum*) and Uttarakhand (*Rhododendron arboreum*), and the state flower of Himachal Pradesh (*Rhododendron campanulatum*) and Nagaland (*Rhododendron arboreum*), in India (Kant, 2004)<sup>[15]</sup>.

Through entrepreneurship, indigenous practices are encouraged to be included as revenue streams that fit within the trend of innovation for socio-economic development without compromising environmental sustainability. These daily forest-based resources usually range from 10% to 60% of the total household income in rural areas (Babulo *et al.*, 2009; Asfaw *et al.*, 2013)<sup>[4, 3]</sup>. The harvest of *R. arboretum* flowers, which is a significant and commercially successful industry in the Western Himalayas, is widely used by the locals and offers them a means of generating income (Sastry and Hajra, 2010)<sup>[32]</sup>. The study area of Uttarakhand is abundant in *Rhododendron* forests, and the villagers profit economically from a widespread active harvest of *R. arboretum*. The study finds significant opportunities for commercializing items and byproducts that can improve the lives of hill people without depleting natural resources.

#### Production patches of *Rhododendron* in India:

*Rhododendron* (buransh) is primarily found in elevation between 2000 to 4000 meters, where it experiences alpine conditions and a temperate environment. There are six different varieties of rhododendrons in Uttarakhand; the most common species is *Rhododendron arboreum* Smith, which is also designated as the state tree. The Valley of Flowers National Park at Gobindghat, Deoria Tal, Chopta, Harsil, Kausani, Barsar, Dodital and Malla, among other

picturesque high-altitude locales, are the ideal places to see the splendor of buransh in bloom throughout the spring.

### Botanical description of *Rhododendron*

#### Classification

Kingdom: Plantae  
Phylum: Magnoliophyta  
Class: Angiospermae  
Order: Ericales  
Family: Ericaceae  
Genus: *Rhododendron*  
Species: *arboreum*

*Rhododendron* is usually found in dark red color. Flowering begins in March, while November marks the fruiting season. Acidic soil, rich in humus, leafy and well-drained is preferred by the plant. Dappled shade is the ideal amount of sunlight required for its growth (Srivastava, 2012) [38]. A trunk often has a lot of branches which is either twisted or gnarled (Orwa *et al.*, 2009) [25]. Reddish-brown, tough, and soft bark exfoliates in thin flakes (Chauhan, 1999) [8]. When the petiole is young, it has white scales covering it. The leaves are oblong-lanceolate, 10-20 cm long, crowded, and narrower towards the ends of branches. The petiole is glabrous above and white or reddish brown-tomentose underside (Orwa *et al.*, 2009) [25]. It has a glossy green color and sharply carved veins that extend from above the white fawn. The underside is covered in cinnamon or rust-colored felt (Rai and Rai, 1994) [29]. Flower occurs mainly in the terminal part of the plant which is large, globose, compact corymbs that range in color from deep scarlet to red with white markings, deep pink or red, to white. The plant bears about 20 blossoms in a single branch (Orwa *et al.*, 2009) [25]. Calyx is small, mainly oval with scarious pale-yellow lobes. The corolla campanulate is a funnel-shaped tube with five recurved, fringed lobes of 2.5-6.5 cm in length (Paxton, 1843) [27]. Hypogynous declining, filaments are filiform, anthers; ovate and Ovary 6 - 10-celled, style-capitate

(Paxton, 1834) [27]. Fruits are capsular, cylindrical, curved, longitudinally ribbed, and seeds are found ellipsoid, minute, dark brown (Orwa *et al.*, 2009) [25]. *Rhododendron* has vernacular names among the people in Garhwali, it is known as 'buransh', in the kumaoni region named 'eras', in Punjab, it is 'adrawal', 'Billi' in Tamil, 'Lalingurans' in Nepali, and 'Kattupoorvarasu' in Malayalam. (Srivastava, 2012) [38].

It has a special place in Uttarakhand because it not only symbolizes the state's identity but also its culture. Every year, at the start of spring, Kausani hosts the Buransh Mahotsav, a festival that celebrates the beauty and practical applications of flowers with tremendous fervor. The festival honors the natural world's creations, the mountains, and ethical travel. It also possesses good anti-inflammatory, anti-diabetic, and antioxidant qualities, among many other medical qualities. As the winter turns into spring, the villagers prepare delectable buransh chutney and buransh juice to calm the body and soothe the stomach. Thus, Uttarakhand's Springtime is renowned for its captivating *Rhododendron* blooms, chutney and juices which are not only relished by the locals but a rare delicacy for travelers too.

Uses of *Rhododendron*: *R. arboretum* wood is used to make charcoal, fuel and from various products such as giftbox, handles, and packsaddles (Chettri and Sharma, 2009; Rana *et al.*, 2015) [9, 30]. Bark paste of *Rhododendron* can be used to treat cuts (Bhattacharyya, 2011) [5]. Typically, gorgeous flowers which attracts everyone are utilized to decorate houses. Owing to their tart and sweet flavour, flowers are consumed raw or turned into juices or chutneys for domestic use. While dried powder of the flower is used as a medication to treat bloody dysentery, flower juice is used as a refresher and is helpful in treating fever, diabetes, rheumatism, headaches, and stomach-aches (Semwal *et al.*, 2010; Sharma and Samant, 2014; Krishna *et al.*, 2014; Sharma *et al.*, 2010; Shilajan and Swar, 2013) [33, 36, 17, 35, 37] indicating medicinal properties available locally.

**Table 1:** The traditional use of different parts of *R. arboreum*.

Parts of <i>R. arboretum</i>	Uses	Area	References
Bark	Leaves and bark: Reduce roughness of the skin.	Manoor Valley, Pakistan	Rahman <i>et al.</i> (2018) [28]
	Bark juice: Cure coughs, piles and liver disorders.	Allai Valley, Pakistan	Haq (2012) [12]
Stem wood	Wood: Make handles, packsaddles, gift boxes, gunstocks and posts.	Arunachal Pradesh, India	Paul <i>et al.</i> (2005) [26]
	Fuel	Arunachal Pradesh, India	Zhasa <i>et al.</i> (2005) [42]
Root	Decoration of the roots is used in curing the early stage of the cancer.	Nagaland, India	Khare (1980) [16]
Leaves	Young leaves: Applied on the forehead to reduce headaches, External parasites Dried leaf tincture: Treatment of rheumatism and gout	Uttaranchal, India Homeopathic material medica	Verma <i>et al.</i> (2010) [41]; Middelkoop & Labadie (1983) [21]; Joshi <i>et al.</i> (2018) [14]
Flowers	Flower buds: Vegetable	Uttarakhand, India	Devi <i>et al.</i> (2018) [11]
	Flower aqueous extract: Food coloring agent	Himachal Pradesh, India	Dangwal <i>et al.</i> (2014) [10]
	Flowers are eaten raw; sauce and jams are also made	Jammu and Kashmir, India	Shanmugam <i>et al.</i> (2011) [34]
	Dried flowers fried in ghee: stop the blood dysentery	Tamil Nadu, India	Uniyal <i>et al.</i> (2006) [40]
	Crushed flowers: stop the nasal bleeding	Himachal Pradesh, India	Kumari <i>et al.</i> (2015) [18]
	Flowers and leaves are fitted with long ropes made of munja grass and tied around the houses and temples for decoration and women also decorate their hair with flowers. It has curing effect for menstrual disorders.	Himachal Pradesh, India	Negi <i>et al.</i> (2013) [24]
	Fruit juice: commercially sold as a health tonic, cure diabetes, fever, stomach ache and heart-related problems and helps when fish bones stuck in the throat	Uttarakhand, Western Himalaya, Sikkim, India	Nand & Naithai (2018); [23] Tiwari & Chauhan (2006) [39]; Roy <i>et al.</i> (2014) [31]

**Localized Entrepreneurial Products of Rhododendron (buransh) in Uttarakhand:** Many goods made from rhododendron (buransh) are made by Uttarakhand residents. The products of rhododendrons are well-known for their applications and unique flavors, which make them attractive for commercial promotion as revenue streams for improving livelihood and achieving financial stability. Buransh products, which are mostly high in potassium, calcium, iron and vitamin C, are eaten as appetizers to relieve seasonal and mountain sickness.

- 1. Buransh Juice & Buransh squash:** It is considered as Uttarakhand's welcome beverage and it produced mainly from flowers of buransh. The beverage is helpful in calming the body and eases digestive issues. It is also used to stop excessive bleeding in the female during menstruation.
- 2. Buransh chutney:** It has sweet-sour taste, made of flower petals. Taken alongside rice, rotis or paranthas, buransh chutney is mostly used to treat seasonal sickness. During the change in weather, the local people prepare buransh chutney and buransh drink to calm the body and soothe the stomach.
- 3. Buransh tea:** Buransh flowers are used to make a light herbal drink that is intended to relieve inflammation in the body.

In addition to the along with the above-mentioned products, locals in Uttarakhand also prepare other delicacies like buransh pakoda and buransh parathas which are relished by the entire family.

### Entrepreneurial aspects of Rhododendron

Rhododendron offers a significant potential for profit. Mostly in Uttarakhand state, 10-15% resources are used and 85-90% resources are not used. It shows how much potential there is for the locals to increase their income. Since over 50% of the available resources cannot be harvested, this is beneficial from a sustainability and regeneration standpoint. Rhododendron (buransh) is seen as a pleasant drink that has to be transformed into a medical drink because it naturally regenerates itself and contains several medicinal qualities in its blossom. The regeneration usually takes place on forest floor.

Taking into account research conducted in the Garhwal region (Western Himalaya, 2016-17), which found that *R. arboreum* flowers can increase stakeholders' financial flow. Everywhere resources are available, at least thirty percent of households participate in the village-level collecting and trading of *R. arboreum* flowers. A household's annual crop and collection of 25-350 kg contributes Rs. 6000-37,000 (USD 89-545). This income from rhododendron is insufficient for one family's whole year sustainability, given that, the yearly per capita income for the Garhwal region's five hill districts (Rudraprayag, Tehri, Uttarkashi, Pauri and Chamoli) ranges from Rs. 8352-118,448 (compared to Rs. 161,102 or USD 2370 for the entire state) for the year 2016-2017 (Anonymous, 2017-18) <sup>[1]</sup>. Thus, there is a strong correlation between the income-producing capacity of *R. arboreum* and the potential of NTFPs in India (Alexander *et al.*, 2001; Bhatt *et al.*, 2000); Maikhuri *et al.*, 2004) <sup>[2, 6, 20]</sup>. Since rhododendron contributes significantly to the well-being of people living in hilly regions, many villagers have chosen to use it as an entrepreneurial venture to generate

income during the peak flowering season (Feb.- April). Many NGOs and stakeholders are getting involved in this entrepreneurship because of the rise in market demand. These days, the buransh products are sold under several brand names and advertised at several exhibitions and fairs held at the local, district, state, and federal levels. The value of these products has increased due to proper processing and sales through organized channels, and these platforms allow them to reap the benefits more quickly (Chauhan *et al.*, 2021) <sup>[7]</sup>.

### Conclusion

People living in hilly areas have limited opportunities to improve their standard of living and economic status. Rhododendron is inexpensive and advantageous to humans for consumption and supporting local businesses without depleting natural resources. Uttarakhand, particularly the Garhwal region, has spiritual ties to Char Dham, drawing pilgrims and visitors. These connections can also draw entrepreneurs and natural product makers looking to sell their goods both domestically and abroad. Presently the economic benefit driven by Juice leads to more interest in the species; people along with the government should go for participatory conservation of the species. While receiving the financial benefit, people will undoubtedly be aware of the significance of the species, and they will contribute to the conservation of *R. arboreum*. Given that *R. arboreum* is a keystone species, the species must be conserved. It will surely promote national and societal advancement at the local level.

### Statements and Declarations

The authors declare that they have no conflict of interest.

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