The Wonder Berry:

LADAKH’S SEABUCKTHORN
MESSAGE

Ladakh’s geographic and climatic characteristics have lent themselves to produce the world’s most unique fibre which is Pashmina and grow unique varieties of Apricot and the berry of Himalayan pride which is seabuckthorn, marking them with unique qualities amiss from such products found across the world.

While much is being done to popularise the unique products of Ladakh, concerted efforts by local authorities that address poor integration with the national and international market, support technological advancement and promote Brand Ladakh through the right policy interventions and incentives can catapult these sectors to the forefront of international markets. Exporting these products is also a strategic priority for Ladakh with tremendous potential to transform the economy of the union territory.

Aiming to showcase the potential of Ladakh’s flagship products, I would like to congratulate to Invest India and officials of Industries & Commerce Department, Ladakh for bringing out this engaging report series on Pashmina, Apricots and Seabuckthorn. I trust that investors will find these publications to exceptional resources in their exploration of India and the union territory of Ladakh. I hope to soon welcome you to the rooftop of the world and to participate in the advancement of its flagship products.

(Feroz Ahmed Khan)
FOREWORD

Nestled in the laps of the majestic Himalayas, "Ladakh" is one of the highest regions in the world and one of the most unique geographies to visit. It was recently given the status of a Union Territory (UT). Since then, there has been a concerted effort by the people and governments at the local and national levels to leverage Ladakh's specialty products such as Pashmina, Apricots and Sea Buckthorns and popularize them world over. Putting Ladakh on the global export map, in its specialty products, by creating the necessary market linkages, addressing existing issues and providing policy support and incentives to the local communities to adopt global best practices to make Ladakh a major hub for its niche products is one of the foremost agenda items of the new administration.

Leh, the most accessible town of Ladakh, is an important trade centre and one of the most preferred places for tourism as well. It’s bustling with many young entrepreneurs and the region now stands a chance to make the right advancements in technology, gain investor confidence and construct value chains for boosting its economy. At this point of time, the youth of Ladakh need to find vigor for entrepreneurship, scaling up businesses and capturing the untapped potential to complement the government's concentrated efforts. I congratulate Invest India for handling three detailed research projects and highlighting the potential of local industries in Ladakh and especially Leh. I am certain that the potential investors, embassies and companies will find these publications useful in their exploration of India and the Union Territory of Ladakh. I hope to soon welcome you to Himalayan district of Leh to participate in the region’s socio-economic transformation.

(Adv. Tashi Gyalson)
Chairman/Chief Executive Councilor,
LAHDC, Leh
Administration of UT of Ladakh
Department of Industries & Commerce
Ph: 01982-255567, Fax: 01982-255568
e-mail: ladakhdivcom@gmail.com

Saugat Biswas, IAS
Secretary

D.O. No. Secy/I&C/UTL/2020-

Foreword

Ladakh was carved out as a separate Union Territory on 31st October, 2019. Since then the Union territory has focused on a journey of development taking all sector into consideration. The vision of the Hon’ble Prime Minister of India, steered into reality by the Hon’ble Lieutenant Governor Shri. Radha Krishna Mathur has catapulted the populace of Ladakh, bringing them face to face with a new level of prosperity and well being, that is sustainable and focused to the residents of Ladakh.

In the last 2 years Ladakh has seen development in the fields of health, education, social sector, infrastructure, road connectivity, telecommunications, civil aviation, empowerment of grass root democracy and the industrial sector.

Ladakh has embarked on the journey of industrial development by lifting up the indigenous sector, the produce and products of Ladakh. The focus has been on creating entrepreneurs and industrialists from among the people of Ladakh by leveraging the resources available in the Union Territory.

In this journey the Industry & Commerce department of Ladakh has joined hands with various institutions and agencies such as NIFT, NID, KVIC, NIFTEM, INVEST INDIA among others to contribute in their own unique way in this path of development.

INVEST INDIA has been instrumental in conceptualizing Ladakh’s first Incubation centre, supporting in various domain specific areas for supporting the startup ecosystem in Ladakh and are on the way to assist us in the food processing and textile sector. I am glad that the INVEST INDIA is bringing out the preliminary reports on Seabuckthorn, Apricot and Pashmina in consultation with the I&C Department of Ladakh. I trust that the reports will be fruitful in introducing the sectors, theirs use and economic potential to the various potential buyers, processors, financial agencies and entrepreneurs. I congratulate the officials of I&C Department, Ladakh and INVEST INDIA for the effort.

Saugat Biswas
MESSAGE

An amalgamation of some of India’s most unique landscapes and warmest people, Ladakh crowns India’s diversity—both demographic and geographic. Despite its harsh topography and a highly variable cold desert climate, Ladakhi agriculturists have leveraged Ladakh’s environment to cultivate some of India’s most exotic agricultural products.

Leh, the largest district of this union territory, stands out for its spectacular scenic settings and emerging commercial potential. With a population of a mere 1.33 lakh, Leh has carved itself as a buzzing city with emerging entrepreneurs and businesses that are boosting regional indigenous industries and creating many new ones. Leh’s growing and self-reliant rural economy is also a testament to Prime Minister Narendra Modi’s vision for an Atmanirbhar Bharat.

Ladakh’s relative seclusion in the Great Himalayas, it’s picturesque locations and cultural diversity make it favourable for both domestic and international tourism. Ladakh displays a strong and promising potential for upward growth. Not only is the region blessed with an abundance of natural resources like solar and wind power, but it is also a hub for skilled and highly specialised artisans. It produces the world’s finest quality of plush pashmina, apricots and sea buckthorn that thrive in such climatic conditions. The considerable market advantage these products hold over the international competitors is, however, still untapped. The significant and bold steps taken by Prime Minister Modi in the Ladakh region will bring investments into the UT and boost trade and commerce and enable the emergence of an export-oriented economy.

The emerging market for these products has pushed Ladakh at the precipice of rapid economic growth, generating sustained employment and bringing in long term investments from several budding entrepreneurs. Despite gaps in their supply chains, pashmina, apricots and sea buckthorn markets can be enhanced through policy interventions, technological advancements and promotion of global best practices. This will enable these products to maximise their potential and scale newer heights in international value chains.

I congratulate Invest India for publishing three detailed reports that demonstrate Ladakh’s commercial development and local industry potential. I am confident that investors will find these publications to be an invaluable resource as they explore India and the union territory of Ladakh. I am eager to witness the growth of these industries and extensive international support in helping realise it.

(Shriram Balasaheb Suse) IAS
Foreword

Set amidst the most northern reaches of the Himalayas, India’s recently created union territory on 31st October 2019, Ladakh, is home to among the world’s most unique geographies. The relative seclusion of the region has also allowed for the emergence of a vibrant culture that adds colour to the cold brown desert in which it has flourished. The region is abuzz with new entrepreneurs and industries who are fuelling regional indigenous industries that are a mine of untapped potential.

Products like pashmina, apricots and sea buckthorn are among such sectors that have, over the centuries, come to define Ladakh. Representing both the uniqueness of Ladakhi ecology and its skilled artisans, these products are integral part of the local culture and economy. They are now only just arriving at the national and international stage. Their potential not only promises to generate jobs for hundreds of Ladakh’s youth in the coming years but can also produce significant monetary gains for entrepreneurs whose visions are rapidly changing Ladakh. The emerging market for these products has pushed Ladakh at the precipice of economic growth and prosperity.

I would like to extend my congratulations to Invest India and officials of Industries & Commerce Department, Ladakh for undertaking these three projects and producing three detailed reports that highlight Ladakh’s business transformation course and the potential of its local industries.

(Santosh Sukhadeve) IAS,

Phone (O) : 01985-232216 Mobile : 7889661600 Email : santoshsukhadeve1@gmail.com
Situated in the lap of the vast Himalayas, the pristine region of Ladakh, attracts people from all over the world with its inexplicable beauty and warm hospitality. Among the many main stays of life in the Himalayas are lesser known yet wonderful products such as sea buckthorn, apricots and Pashmina, all a vital source of both, survival and pride for the Ladakhi people. Besides providing much-needed nutrition and warmth in our cold and arid territory, such products also host immense environmental and economic benefits and will play an ever-growing role in the UT’s sustainable development. While the local people have been using them for centuries now, it is in the recent years, that their popularity has increased globally due to their high-quality, organic nature and ethical trade practices. For instance, the Ladakhi pashmina is the world’s finest wool while our sea buckthorn berry is fully organic by default and the best quality grown in the Himalayan region. Similarly, our unique apricot variety, the Rakhsy Kargu, and the Halman are among the sweetest apricot types in the world. Besides their high quality, these products support the livelihood of the local people engaged in their production and also provide a template to promote fair trade practices in these products in the future.

With Ladakh becoming a union territory two years ago, there is a concerted effort by the people and governments to leverage Ladakh’s unique, specialty products and popularize them. The government’s One District, One Product (ODOP) is a landmark initiative in this regard by helping to realize the huge potential of these products through better marketing, branding and export linkages. The Industries Department is also actively involved in promoting these very special products through targeted exports, higher production, value addition and better remuneration for our artisans, farmers and entrepreneurs dependent on them. Once our initiatives to promote and market apricot, sea buckthorn and Pashmina begin to show results, the Department will expand its initiatives and include other Ladakhi products like buckwheat, Goji berry and many other medicinal plants as well.

I complement the Invest India team and my colleagues at the Industries Department in bringing out this series of engaging and insightful reports on some of Ladakh’s flagship products. I am certain this timely effort will provide much needed information to potential investors, embassies and companies to explore, invest and participate in Ladakh’s new journey towards economic and social transformation.

(Moses Kunzang)
Message

Ladakh, renowned as the “Land of Passes” is situated in the most northern region of the majestic Himalayas. The union territory is an amalgamation of cultural and demographic diversity, with immense market potential for sea buckthorn, apricots and the Ladakhi pashmina – a critical part of the heritage of the region. These unique products gave been identified under the One District One Product (ODOP) initiative, which under the aegis of ‘Districts as Export Hubs’ is aimed at manifesting the vision of Hon’ble Prime Minister of India to foster balanced regional development across all districts of the country.

Under this initiative, the government is committed to facilitating investments into these products to bolster trade and commerce and enable the transition to an export-oriented economy. ODOP is a transformational step in realizing the true potential of a district – it fuels economic growth, generates employment and regional entrepreneurship. There is a critical need for efficient utilization of Ladakh’s very high potential in terms of labor, land and natural resources which are the basic inputs in the production process. Export promotion will ensure the maximization of these products’ potential and position them in international value chains.

The Strategic Investment Research Unit (SIRU) at Invest India is publishing three extensive reports, that showcase Ladakh’s commercial development and local industry potential. I hope you find these reports informative in your exploration of the very interesting economic opportunities in Ladakh.

Sincerely yours,

Deepak Bagla
INTRODUCTION

Grown naturally in abundance in the vast lands of trans-Himalayan Ladakh, the seabuckthorn berry (*Hippophae* spp. L.) is a part and parcel of daily Himalayan life and a provider of many daily necessities for the local communities who use every part of the shrub including the fruit, leaf, twigs and roots, for a range of activities. While the fruit is consumed fresh and dried as food and nutritional supplement, the leaves are a vital protein source for the local animals. The sturdy branches and twigs make strong fences and are an important source of firewood in an otherwise cold, barren land. Seabuckthorn is a drought-tolerant and versatile plant, thriving even in extreme temperatures in the range of -43°C to ~40°C. The plant also fixes atmospheric nitrogen and thus prevents soil degradation and desertification.

Historically, the berry has been a crucial mainstay of Himalayan life, not merely providing a nutrient-rich food source in a hilly desert but also giving a much-needed forest cover in the oxygen-scarce region. This miraculous berry of the hills finds its earliest mentions in the 8th century Tibetan text *rGyud Bzi* in which it was lauded for its numerous health and wellness benefits owing to its high nutrition density with 190 bio-active compounds, vitamins, minerals, flavonoids, antioxidants and most importantly, the natural fatty acids, Omega-3, 6, 7 and 9.

Home to over 70 per cent of the total area (13,000 hectares) under seabuckthorn cultivation, Ladakh enjoys a strong edge over others in the potential to emerge as a major production hub of seabuckthorn both in terms of high quality and quantity of produce. However, a lack of adequate infrastructure coupled with local-level issues, have restrained the region from realising its true capability. These include low harvest figures, lack of high value-add products in the value chain, absence of cold storage, warehousing and logistical facilities as the major impediments to meeting the high demand both domestically and internationally.

The global seabuckthorn market is a booming industry estimated to grow at a CAGR of 9 per cent in 2021-2026. The global market for the berry is largely dominated by the Asia Pacific region followed by Europe and North America. Although the plant is not very popular in North America, it is witnessing considerable growth in the region where its berries are gaining popularity among consumers due to wide uses in the form of food, nutraceuticals, cosmetics and fodder among other products.

On the back of rising demand and enhanced awareness about the many benefits of seabuckthorn, Ladakh, the natural home to the berry, has all the ingredients to develop a global-level value chain for seabuckthorn and its numerous processed products. One important feature that distinguishes the Ladakhi seabuckthorn from rest of the world is that most of this fruit grown in Ladakh is fully organic as no chemicals or pesticides are used in its cultivation. The organic nature of Ladakh’s seabuckthorn berry is an important Unique Selling Point (USP) of the crop which must be better communicated, marketed and branded to enhance its global competitiveness and visibility as well as promote its cultivation in the region as a profitable, sustainable source of livelihood for the people. This is broadly what this booklet intends to do—inform the investor community, and the world at large, of the tremendous potential of in transforming not just the lives of the local people but also the economy of the newly formed union territory, situated in some of the world’s most challenging geographies.
LADAKH: THE ROOF OF THE WORLD

The Union Territory of Ladakh is a one-of-a-kind combination of nature, spirituality, and adventure. Comprising of two districts namely Leh and Kargil, it constitutes India’s highest plateau at over 3,000 m (9,800 ft). Ladakh is bordered by the Karakoram and Himalayan Mountain ranges to the North and South, the Tibet Autonomous Region to the east, and the union territory of Jammu and Kashmir to the west and stretches for about 45,000 square miles sharing international borders with Pakistan, China and Afghanistan.

Popularly known as the “land of passes” it has a chilly and dry climate with an average annual precipitation of about 3 inches (80 mm) and a fragile ecosystem characterised by low plant density, high winds and high-UV exposed atmosphere. It sees severe winters and houses some of the highest places of the world including its capital and largest town Leh, which is located at an altitude of 11,400 feet. Although Ladakh hosts large, rugged hills but it is home to some of the warmest people. The region is renowned for its remote mountain beauty and its Buddhist culture and is sometime called ‘Little Tibet’ due to the strong influences of Tibetan culture among people.

Key Sectors: Tourism and Wellness, Renewable Energy, Textiles, Agriculture and Food Processing.
WHY LADAKH’S SEABUCKTHORN:
A NUTRITIONAL POWERHOUSE

Home to 190+ bio-active compounds
Richest plant source of Vitamin-B12
Richest source of 5HTP (Hydroxytryptophan) that increases serotonin (also called happy molecule) levels in our brain

Rich source of antioxidants
Rich source of complete protein

12X more Vitamin-C than Oranges
3X more Vitamin-A than Carrots

High Vitamin-E content

Potent source of Flavonoids, Phytosterols, Malic Acid, Polyphenols and B-sitosterols
Powerhouse of Minerals

Grows in the wild so Fully Organic

DID YOU KNOW?

The seabuckthorn bark contains a high level of serotonin – much more than the popularly known bananas and chocolates. So, the next time you feel low, make sure to consume a decoction of seabuckthorn bark to feel better!

During their space missions, the Russian cosmonauts used seabuckthorn oil to protect themselves from harmful radiations. Seabuckthorn juice was also the first beverage to reach space when Russian astronauts took the drink to maintain their health in space!

Seabuckthorn is a great medicinal plant and is proven to improve metabolism, immunity and cardiovascular health as well as strengthening our cell structures and minimising the impact of environmental and oxidative stress on human body.

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THE WONDER BERRY MARKET OPPORTUNITY

Globally, total seabuckthorn acreage (including wild and cultivated crop) is estimated around 3 million hectares spread around in forty countries. Of these, nearly 90 per cent of all seabuckthorn is grown in a handful of countries including China, Mongolia, Russia, North Europe and Canada with China being the biggest producer of the berry (having over a million hectare in seabuckthorn). While Canada is the world’s top exporter of seabuckthorn, the US is its largest importer. Researchers estimate global seabuckthorn market including food, beverages, medicines, cosmetics and industrial material to be valued at over USD 60 Bn annually (2014). Trade figures show booming business for exporting countries like Canada, Thailand, Chile and Peru with double-digit CAGRs.

In contrast to the global market, the Indian seabuckthorn market is relatively under-utilized, and an infant industry largely centred on fulfilling local demand. Of the 13 thousand hectares under seabuckthorn, 70 per cent of it is grown and cultivated in the Himalayan region of Ladakh with an annual harvest of around 600 tons. This implies a harvest rate of merely 6 per cent of the total seabuckthorn in the area and highlights the large potential that lies untapped due to harvesting issues. Despite the price of fresh berry rising from INR 8/kilo in 2001 to INR 48/kilo in 2021, the corresponding rise in production has not happened. However, with the advent of new technologies and a greater impetus on agro-processing, government estimates suggest net income of around INR 500 crore by 2030 from harvesting and primary processing of seabuckthorn in Ladakh and is also expected to lead to a commensurate increase in incomes as well.
The value chain of seabuckthorn in Ladakh consists broadly of the UT’s many farmers, berry collectors, processors (~15-20), community/ cooperative societies, manufacturers, agents, exporters, startups and private enterprises, the forest department and the research institutions specialising in seabuckthorn research and promotion activities such as Defence Institute of High Altitude Research (DIHAR) and Regional Research Stations of Indian Council for Agricultural Research’s Central Arid Zone Research Institute (ICAR-CAZRI) and Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir (SKUAST-K).

*PME = Pectin Methyl Esterase

**Primary processing of seabuckthorn berry**

**Whole Fruit**
- Fruit Selection (Inspection)
- Fruit Washing
- Pressing

**Press Cake - 45%(w/w)**
- Separate Seed (Finisher)
- Clean Seed
- Grind
- Extraction
- Oil

**Juice - 55%(w/w)**
- Floating Oil Elimination
- PME* Digestion
- Remove Residual Slids
- Eliminate Floating Oil
- Opalescent Juice
- Sterilization
- Package

**Mix Juice**
- Residual hull
- Dry and Extract
- Yellow/Orange Pigment (food color)

With increased awareness among people about the remarkable benefits of seabuckthorn for both health and food security in cold arid region of Ladakh, recent years have witnessed a growing interest and presence of startups and entrepreneurs keen to create higher-value addition from the fruits and seeds of seabuckthorn through use of modern technologies, innovation and better market linkages. These new-age, young entrepreneurs are not just generating vital, stable and profitable sources of livelihood for the local youth but also inspiring the next generation to build upon these innovations and create greater value for their local community and the regional economy at large.

The earlier efforts by the DRDO’s Defence Institute of High Altitude Research (DIHAR) to develop and transfer technologies for primary processing of seabuckthorn into value-added products like juice, jams, jelly, pulp, squash, oil and UV-protection creams, have significantly helped in promoting entrepreneurial spirit among the youth and pushed them to drive their own ventures in such products. Today, several Ladakh-based enterprises are producing innovative products like seabuckthorn tea, jellies, juices, face oils, soaps, mouthwash and soft-gel capsules in an effort to popularise this miraculous crop.

Some of the most innovative Ladakh-based companies involved in seabuckthorn processing include:
CHALLENGES AND POLICY INTERVENTIONS

As mentioned above, the seabuckthorn berry faces several challenges that have prevented its large-scale adoption and popularity and consequently, hampering Ladakh’s development as a major production hub. Timely and effective redressal of these issues is of paramount significance if the UT is to realise its goals of long-term, inclusive economic development that is also climate sensitive. Brief policy recommendations and solutions are also enlisted along with each issue/challenge to emphasise specific, targeted actions to achieve the desired outcomes of enhancing seabuckthorn cultivation, post-harvest yields, a bigger basket of value-added products and higher quality produce that is export-ready and globally competitive.

1. Berry perishability:

The seabuckthorn berry is a delicate and highly perishable one and needs to be processed the same day of harvesting. Long distance transportation is also an issue.

**Proposed Interventions**

a. Primary processing facilities of fresh seabuckthorn berry should be established at the site of berry collection and other components such as pulp, seed and hull sold to firms located outside the region for further value addition. To address this issue, the industries department of the UT has identified a primary processing facility in Nubra which will enable the farmers to process their berry on the same day of harvesting it, thereby reducing wastage and crop loss.

b. Cold chain facilities should be developed in major seabuckthorn processing areas to extend the processing time and development of value-added products. In an effort to address this, a cold chain facility has been developed to help processors and entrepreneurs in processing the fresh berry. This facility is located in the UT’s capital Leh and has been developed with the active involvement of the Industries Department.

c. To solve the transportation problem, processors should be incentivized to use reefer vans (refrigerated and insulated vans). To minimise this problem, the UT’s Industries Department has collaborated with APEDA to avail the reefer van facility for 3-4 entrepreneurs initially with further plans to expand this program based on its success.

d. Plastic fibre bags with proper aeration for semi dried organic material should be used otherwise, rancidity may occur. The UT’s Industries Department is aware of this challenge and has approached the IIFPT and IIP for sourcing tetra and other suitable packaging options for seabuckthorn products.

2. Seabuckthorn as a horticultural crop:

Majority of Ladakh’s seabuckthorn grows on land under the control of the UT’s Forest Department with strict regulations enforced.

**Proposed Interventions**

a. Seabuckthorn is considered as a forest crop. The crop needs to be declared as a potential horticultural crop in the union territory so it can be promoted as a potential horticultural crop by the UT’s Horticulture Department and incentivised like other horticultural crops. To address this, the upcoming industrial development policy of Ladakh (currently being drafted), will have special prioritisation and support for seabuckthorn farmers.

b. Further, a collective/association of producers of seabuckthorn needs to be established so that collection can be managed in an efficient as well as environmentally friendly manner on a large scale. Various departments in the UT including the Forest Department, Horticulture Department and Industries Department are working in close cooperation to simplify processes for seabuckthorn collectors and moving away from the previously strict regulations.
c. The presence of collectives like farmers producers’ association (FPOs), granin agriculture markets or village level clusters will also allow for regional economic development by strengthening competitiveness, increasing productivity, stimulating innovative new partnerships even among competitors, and presenting opportunities for entrepreneurial activity. For its part, the Industries Department in Ladakh organises training sessions and workshops for women seabuckthorn berry collectors in summers to train them in making value-added products. The Department also collaborated last year with the tribal welfare body, TRIFED, and launched 2-3 products to provide better sales and marketing options for these products.

3. Transforming barren land into green cover:

Ladakh is largely barren with only 0.06 per cent under forests and 11,692 ha utilized for agriculture. This scanty vegetation leads to low-oxygen levels and also keeps vast tracts of land unutilised.

Proposed Interventions

a. The seabuckthorn plant is fast growing, can withstand not only a wide range of habitat conditions, but also can be propagated through suckers and semi-hardwood cuttings. To move towards this, a Centre for Excellence in Nimo and DIHAR are developing seabuckthorn plantation to test the costs and revenues on a pilot basis. DIHAR is also involved in developing orchid plantations for seabuckthorn.

b. Plantation of this species along the banks of rivers, on waste lands and hill slopes can not only increase the area under vegetation but also prevent landslides, reduce the run-off of water and help in checking erosion besides enriching the soil by fixing atmospheric nitrogen. These plantations grow in large areas around the Indus and Shyok river belts to conserve the soil quality and prevent land degradation.

c. Entrepreneurs and farmers in areas with dense and high number of seabuckthorn plants are converting barren lands by undertaking organised cultivation of seabuckthorn. Farmers and entrepreneurs from various villages are striving to get involved in the organised cultivation of the berry like other crops.

4. Organic Certification and GI Tagging:

Since seabuckthorn is grown in the wild in Ladakh naturally, it is fully organic in nature and must be certified as such to open up new export avenues for seabuckthorn in different countries.

Proposed Interventions

a. Seabuckthorn harvested in Ladakh are wild harvested. Hence, efforts need to be made to mandatorily certify seabuckthorn of Ladakh and its related activities as organic.

b. There is a definite need for GI tagging of seabuckthorn of Ladakh origin and the application process must be expedited. To this end, the Industries Department of the UT has been acting as a bridge between the seabuckthorn farmers and manufacturers and the Indian government’s GI tagging agencies wherein the Director of Ladakh’s Industries Department is the applicant for the GI tag for seabuckthorn and are expecting to receive it by 2022.

c. Packaging should have name of village and district on it.

d. A clear and direct government policy to promote and enhance the seabuckthorn industry in Leh will go a long way in validating the economic value of the crop. It will also be a boost to producers and entrepreneurs. Since Ladakh is the youngest UT, several policies and programs are currently being drafted with support from institutions like DIHAR, APEDA, CSIR etc. and will keep in mind the interests and welfare of all farmers in Ladakh.

5. Poor market linkages:

Market links for seabuckthorn are inadequate and low in number. There are many small players in the value chain. Local entrepreneurs focus only on selling the raw material. Their risk-taking capacity is low. To strengthen these efforts, the UT Industries Department is being supported by many institutions like DIHAR, APEDA, IIFPT, CSIR etc.

Proposed Interventions

a. To strengthen the market linkages, there is a need to set up a single window online system for providing all relevant information and services related to the trade of seabuckthorn in one place.
b. A collective/cooperative unit like ‘Ladakh Seabuckthorn Cooperative Society’ comprising of all local entrepreneurs should be made so as to strengthen their role in the seabuckthorn value chain.

c. Collaborate with and utilize services of new-age ventures and startups like AgriBazaar, Crofarm, Krishitya, Ninjakart to enhance supply chain, expand markets and inculcate best practices.

d. Marketing seabuckthorn as a ‘Superfood’ because of its high nutritional value.

e. Entering into contract farming with major companies like Unilever, Patanjali, Adani Foods and food chains like Dominos, Burger King.

6. Lack of harvesting tools: 

Seabuckthorn berry harvesting is a tedious process. Currently, the berry is harvested by ‘beating the bush’ method which is not user friendly and thus, leads to low harvest levels.

Proposed Interventions

a. Better harvesting tools must be developed and researched and such tools at R&D stages need to be studied in the field conditions to test their applicability. To address this issue, an in-house handheld tool developed for seabuckthorn harvesting was used for trials this year while more other machinery and handheld tools have been proposed to be developed by CSIR-CMERI Durgapur for seabuckthorn

b. Alternatives to ‘beating the bush’ method such as cutting of the branches, freezing the branches with berries, shaking off the frozen berries. (Applicable only for Hergo variety) should be tested and tried.

c. There is also a need to study, analyse and use in Ladakh, the harvesters and tools in other seabuckthorn producing areas in countries like as China, Russia and Canada.

7. Low export figures:

Export potential of the crop has not been tapped and it is currently reaching exporters in low amounts only through commission agents. The UT Industries Department is actively working towards ensuring exports of seabuckthorn from Ladakh to international markets. The UT Industries Department is actively working towards ensuring exports of seabuckthorn from Ladakh to international markets.

Proposed Interventions

a. Product diversification in seabuckthorn needs to be encouraged as there is a huge economic potential for the plant in terms of higher value-added products. This would also require commensurate financial and infrastructural support as well which must be taken on priority.

- Beverages with seabuckthorn such as soft drinks, alcoholic drinks, tea, cosmetics such as hair shampoo, skin creams, oils; medicines like mouthwash, cough syrup; food products such as jellies, purees, marmalades, chyawanprash and sauces, have a large market for seabuckthorn in India and abroad, with proper exposure and branding.

- Processed products made from seabuckthorn have a huge scope and startups can take forward innovative ideas and learn from global best practices. For instance, China has developed nearly 300 types of value-add products from seabuckthorn including alcohol, cough syrup, raw/unfiltered juice and powder/granules-based medicines made from seabuckthorn to treat various ailments.

8. Absence of Package of Practices:

There is no standard package of practices for large scale seabuckthorn cultivation, and this has caused a huge demand-supply gap for Seabuckthorn products.

Proposed Interventions

a. There is a need to have a government policy for converting the dense seabuckthorn forests into a productive agro-forestry sector that contributes actively to the region’s development.

b. Government support is required for scientific cultivation and systematic plantation of seabuckthorn. Involving private players for large scale cultivation should also be considered.

c. R&D on varietal development should be initiated and commercial varieties available in other successful countries like China, Russia, Mongolia and Canada need to be exploited for varietal trials and applicability.

d. There is a strong need to undertake multi location trials of high yielding varieties and selections available at DIHAR, Leh and CSK HPKV Palampur.
The seabuckthorn berry, known as *Tsesta Lulu* locally, belongs to the flowering plant family *Elaegnaceae* and is native to the cold, arid regions of Himalayas spanning across several countries such as India, China and Mongolia. The local populations of these areas have been using the shrub in its entirety, be it the yellow-orangish coloured berries or the deciduous leaves or the hardy branches, all of which serve as vital sources of food, animal feed and firewood in the otherwise cold and barren geography. The recent past has seen many more countries growing it for commercial and environmental use and currently, there are around 40 nations cultivating this plant. Increased awareness about the many benefits of consuming seabuckthorn for human health has significantly contributed in popularising this plant in the last few years. This has bumped up the demand for the raw material and its processed forms globally, leading to high growth in its trade. Countries like Thailand and Canada along with North Europe have leveraged these opportunities to reap the numerous benefits of economic development for seabuckthorn growers.

While the size of the global seabuckthorn market has grown bigger, India has not been able to have a share in it so far. This has happened due to a variety of reasons on multiple levels such as lack of adequate infrastructure and logistical facilities, taxation issues, low harvesting levels and poor market linkages, which have collectively hindered Ladakh’s emergence as a major producer of seabuckthorn within the country and also globally.

The situation is changing rapidly, however, with policy and government support provided under the Mission for Integrated Development of Horticulture (MIDH) and an uptick in interest from young entrepreneurs to innovate and create secondary, high-value products from seabuckthorn, the regional economy is poised for much positive change in the coming years. There is a need to encourage seabuckthorn plantations in Ladakh, as a horticultural crop, deploy newer methods of berry harvesting to increase yields, expedite the GI tagging and organic certification process for the crop and strengthen last-mile linkages with necessary infrastructure so that Ladakh can compete with other major producers of seabuckthorn at the global stage.

The changing dynamics of the post-Covid world order and realigning supply chains have forced countries around the world to relook their supply chains, imbibe resilience in their businesses and diversify their supply chain linkages away from a handful of countries. In this context, it is essential for India under the ‘Atmanirbhar Bharat’ campaign to strengthen the local supply chains of strategically important regions like Ladakh. Doing this is important for ensuring food, human and environmental security in our country since plants like seabuckthorn have an important role to play in gifting better health to us all and healthier air to Ladakh.

**THE WAY FORWARD**

The Administration of Union Territory of Ladakh

Since the region was made a union territory two years ago, there has been a renewed push in bringing Ladakh’s unique native products to the attention of the country and the world by streamlining efforts to promote these products, encourage greater local production and create the necessary infrastructure for these commodities to reach far and wide. Doing so is not important only for its associated economic benefits but also for minimising the impact of climate change in the region as plants like seabuckthorn provide a much-needed green cover to the cold desert of Ladakh and also ensures slope stabilisation and better oxygen levels at such extreme high altitudes. Through discussions with farmers, berry collectors and processors based in Ladakh, this report focused extensively on existing issues and challenges for people involved in this value chain, recommending targeted policy interventions to address such issues and devise strategies to make Ladakh’s seabuckthorn globally competitive and export oriented.

The changing dynamics of the post-Covid world order and realigning supply chains have forced countries around the world to relook their supply chains, imbibe resilience in their businesses and diversify their supply chain linkages away from a handful of countries. In this context, it is essential for India under the ‘Atmanirbhar Bharat’ campaign to strengthen the local supply chains of strategically important regions like Ladakh. Doing this is important for ensuring food, human and environmental security in our country since plants like seabuckthorn have an important role to play in gifting better health to us all and healthier air to Ladakh.
<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Proposed solutions</th>
<th>Implementing agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Skill development and capacity building for farmers</td>
<td>Indian Council of Agricultural Research (ICAR), NPTEL</td>
</tr>
<tr>
<td>2.</td>
<td>Establishment of drying units that implement improved scientific methods for best quality results.</td>
<td>Ministry of Food Processing Industries</td>
</tr>
<tr>
<td>3.</td>
<td>Partnerships and collaborations with innovative organisations in agri-processing.</td>
<td>Ministry of Commerce &amp; Industry</td>
</tr>
<tr>
<td>4.</td>
<td>Better quality assurance standards.</td>
<td>Ministry of Food Processing Industries</td>
</tr>
<tr>
<td>5.</td>
<td>Facilitating irrigation facilities.</td>
<td>Ministry of Agriculture</td>
</tr>
<tr>
<td>6.</td>
<td>Value Added Products - product diversification.</td>
<td>Ministry of Commerce &amp; Industry / Ministry of Food Processing Industries</td>
</tr>
<tr>
<td>7.</td>
<td>R&amp;D on varietal development and harvesting methods.</td>
<td>Indian Council of Agricultural Research (ICAR)</td>
</tr>
<tr>
<td>8.</td>
<td>Clear policy to promote Seabuckthorn as a horticultural crop.</td>
<td>Horticulture Department (UT of Ladakh)</td>
</tr>
<tr>
<td>9.</td>
<td>Single window online system for information – market linkage.</td>
<td>Ministry of Electronics and Information Technology</td>
</tr>
<tr>
<td>10.</td>
<td>GI application and tagging.</td>
<td>Ministry of Commerce &amp; Industry</td>
</tr>
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<td>11.</td>
<td>Area expansion of Seabuckthorn cultivation.</td>
<td>Ministry of Agriculture - Horticulture Department (UT of Ladakh)</td>
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<td>12.</td>
<td>Facilitating producers’ organisations.</td>
<td>Invest India, Ministry of Commerce &amp; Industry / Horticulture Department (UT of Ladakh)</td>
</tr>
<tr>
<td>13.</td>
<td>Establishment of better processing and cold chain facilities.</td>
<td>Ministry of Food Processing Industries</td>
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</table>
ACKNOWLEDGMENTS

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- Dr. Tsering Stobdan, Defence Institute of High-Altitude Research (DRDO)
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- Sh. Rigzin Gylatson, Proprietor, Organic Ladakh Store, Nubra
- Sh. Deldan Gangba, Proprietor, Ladakh Essentials
This following table enlists the different permits and licenses required by seabuckthorn companies and startups to export their products to the respective countries.

<table>
<thead>
<tr>
<th>Exporter</th>
<th>Exporter Compliance</th>
<th>Importer</th>
<th>Importer Compliance</th>
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<td>INDIA</td>
<td></td>
<td>Bangladesh</td>
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<td>1. Incorporation Certificate for the business from the Registrar of Companies</td>
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<td>Radioactivity (Cs 137) testing and certification</td>
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<td>2. Import Export Code from the Director-General of Foreign Trade</td>
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<td>3. Goods and Service Tax registration for tax purposes</td>
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<td>Fumigation certificate</td>
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<td></td>
<td>4. MSME registration</td>
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<td>Health certificate</td>
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<td></td>
<td>5. Trademark registration to protect your brand in foreign markets</td>
<td>Bangladesh</td>
<td>Shipping In Line Certificate</td>
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<td></td>
<td>6. Food Safety and Standard Authority of India registration or license</td>
<td>Bangladesh</td>
<td>Weighmaster Container Certificate</td>
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<td>7. APEDA certification</td>
<td>Bangladesh</td>
<td>Ocean Bill Certificate</td>
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<td>8. Phytosanitary Certificate</td>
<td>Bangladesh</td>
<td>Global GAP Certificate</td>
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<td></td>
<td></td>
<td>Bangladesh</td>
<td>GMO certificate</td>
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<td></td>
<td>Nepal</td>
<td>Country of origin certificate</td>
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<td>Global GAP Certificate</td>
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<td>UAE</td>
<td>2. Animal &amp; Plant Health Inspection Service (APHIS)</td>
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<td></td>
<td>UAE</td>
<td>3. Certificate of Analysis (for Pesticides)</td>
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<td>UAE</td>
<td>4. Health Certificate</td>
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<tr>
<td></td>
<td></td>
<td>Oman</td>
<td>Country of origin certificate</td>
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<td></td>
<td></td>
<td>Oman</td>
<td>Health Certificate</td>
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<td></td>
<td>Oman</td>
<td>Inspection Certificate</td>
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<td>1. Global Gap</td>
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<td>2. Hazard Analysis of Critical Control Points (HACCP)</td>
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<td>Russia</td>
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<td>APHIS Phytosanitary Certificate</td>
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<td>Manufacturer Declaration</td>
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<td>USA</td>
<td>Certificate of Origin</td>
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<td>USA</td>
<td>US FDA registration number, the Regurgitation certificate</td>
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<td>Prior Notice for Imported Food</td>
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<td>USA</td>
<td>FSMA regulations</td>
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The Wonder Berry:
LADAKH'S SEABUCKTHORN

Administration of Union Territory of Ladakh

Industries & Commerce, UT Ladakh

https://ladakh.nic.in/
https://industries.ladakh.gov.in/

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