

## Market Intelligence Fact Sheet (Format for results of RMA)

### Gegharkunik Marz

#### First selected crop

*Botanical name of the crop* - Hippophaë rhamnoides L.

*English name* - Sea-buckthorn

*Local (Armenian) name* - Chichkhan dzhenikanman (Չիչխան դժնիկանման)

Photo 1 (full plant/tree)



Photo 2 (harvested fruits)



Photo 3 (processed product A)



Photo 4 (processed product B)



## 1. Historical origin and cultivation history in project sites

The berries and their usage were also mentioned in China, 1200 years ago, and in Tibetan medical texts around 1000 years ago. From there, Sea Buckthorn spread over Russia and the Ukraine into Europe, finally reaching the British Isles. Russia has long been a center of Sea Buckthorn use and research. Russians discovered that in addition to its many other benefits, it could treat frostbite, a very serious problem in the country's freezing climate. One interesting fact is that as far as historians can tell, Russian immigrants were the first to bring Sea Buckthorn to the United States, where it rarely grows naturally.

Sea Buckthorn was already known in Ancient Greek times. It is also called “Sallow Thorn”, presumably from the berries which can stain the skin yellow (they have been used to make pigments and dyes). Sea Buckthorn latin name is *Hippophae rhamnoides* L., translated to mean “giving light to a horse”.

Although wild sea buckthorn in Armenia grows from ancient times, however the commercial interest has increased in last two decades.

## 2. Conservation status now

Sea Buckthorn is included in the Elaeagnaceae family. It is a family of eudicots of the Rosales order. The family includes around 100 species in three genera mostly found in the moderate geographical latitudes of the Northern hemisphere. Seaberries are classified in the plant taxonomy into six species and 12 subspecies. Sea Buckthorn is native to Central Asia and North-Western Europe. At present, it is also grown in Canada and the USA.

In Armenia there is only one variety - *Hippophaë rhamnoides* L.

<b>Status of inventories as compared to previous years</b>	<b>Resources are not in danger</b>
<b>Degree of danger</b>	Population collects for the use and sale
<b>Protection events</b>	The populations of this species aren't in danger
<b>Justification for species selection</b>	Industrial scale production needs for the introduction of new, valuable varieties of this species

Total area of wild forest of sea buckthorn in Sevan lake basin is approximately 900 hectares by the results of 2017. But Only about 25-30 percent of the harvest is collected during the harvesting season.

### 3. Nutritional values and unique traits

Sea buckthorn berries and the juice extracted from them have high nutritional value, and both have been used by folk healers and herbalists to treat a wide range of health problems, from cough and digestive problems to impaired blood circulation and chronic pain. The purported health benefits of sea buckthorn berries have recently undergone increasingly rigorous scientific evaluation, and the results have been promising.

Here are some of the complex nutritional constituents of sea buckthorn.

The super fruit is famous for its antioxidant, anti-inflammatory, anti-bacterial and regenerative properties. Its health advantages include health of wound, heart diseases, ulcers, burns, acne and other skin related problems.

- ✓ Seaberry is an excellent source of **essential fatty acids**, especially omega-7 and others like omega-3, 6 and 9. Research has found that these fatty acids are significantly beneficial to heart health and capable of lowering the risk of stroke and heart attack.
- ✓ The combination of both essential fatty acids and flavonoids in sea buckthorn increase the **HDL cholesterol** (good cholesterol) in the body and effectively reduce the risk of coronary heart disease.
- ✓ This wonderful fruit is loaded with **vitamin A** and **vitamin E**, which have anti-aging effects and are useful in reducing the wrinkles on your skin. The vitamin A alone is a powerful antioxidant vitamin that is able to protect the mucus membranes and enhance your skin.
- ✓ Seaberry is also high in **vitamin C**, a potent antioxidant vitamin that improves your body's immune system. Together with vitamin E, they have therapeutic effects in relieving muscle tension and getting rid of low-energy conditions due to fatigue.
- ✓ This super fruit promotes **gastrointestinal health**. Experiments have proven that sea buckthorn oil from both the seed and pulp help cure gastric ulcers.
- ✓ Sea buckthorn has an abundance of **anti-inflammatory** agents, including salycins and quercetin. With the aid of essential fatty acids, they form a natural remedy to fight off acne problems.

- ✓ Studies have found that sea buckthorn extracts are great in **treating hypertension**. It could be contributed by the rich fatty acid content in the fruit.
- ✓ Besides the above health properties, sea buckthorn also contains **palmitoleic acid**. The compound is said to assist in healing wounds and burns.

Sea buckthorn is commonly used for land reclamation as well as to stop soil erosion due to its extensive roots and its capability to fix nitrogen as well as other nutrients.

#### Sea Buckthorn Nutrition Facts

Nutritional Value of Sea Buckthorn	
Vitamin C (in 100 g berries)	600-2500 mg
Vitamin E (in 100 g berries)	160 mg
Carotene (in 100 g berries)	30-40 mg
Essential Fatty Acids (in 100 g berries)	6-11%
Flavonoids (in 100 g dried leaves)	14 g
Organic Acids	3.9%
Soluble Sugars	13%
Oil in Juice and Seeds	3-8%

#### 4. Uses and derived products

Since the discovery of the nutritional value of sea buckthorn, hundreds of sea buckthorn products made from the berries, oil, leaves, bark and their extracts have been developed. In Armenia sea buckthorn oil, juice and tea are readily available in supermarkets and pharmacies. It is also used in Eastern Europe as a food colorant and a fabric dye. Examples of commercial products available are: oil produced by Samelon Vardenis sea buckthorn processing company, juices and nectars produced by Sis Natural, Sipan, Noyan Premium, Tamara Fruit and other companies, cosmetic products of Nairian.



Most of the products is made and utilized by individuals from community site. At present, the largest producers of sea buckthorn products are Gegharkunik and Syunik regions. Raw and processed products include: seed oil, fruit oil, raw juice, concentrate juice, alcoholic beverages, jam, cosmetics and other beauty products. Sea buckthorn wine and vodka are also in demand.

**Sea buckthorn oil** is by far the most nutrient-dense product derived from the sea buckthorn plant. It is created from either the seed or the berry (or a combination of the two) and has everything the sea buckthorn plant has to offer in a super concentrated form. It contains all the important essential acids, high levels of vitamins A and E, flavonoids, and tocopherols. While all the nutrients are important to improving health, the essential fatty acids (Omegas 3, 6 and 9) are what make sea buckthorn an effective tool for gastrointestinal, dermatological, cardiovascular and overall health.

**Sea buckthorn juice** is a very popular product being sold. However, it does not have many of the properties of the oil. While it is made from the sea buckthorn berry, it loses many of its nutrients when it is being manufactured. Sea buckthorn berries are extremely acidic, thus, very sour and nearly impossible to consume on their own. To make sea buckthorn juice, the berries are crushed, diluted with large amounts of water (usually 5:1 or more) and then sweetened with various forms of sweeteners or their juices. Products that claim to be 100% juice can still only contain a small percentage of pure sea buckthorn juice. In fact, it is allowed and product can be called 100% juice as long as the only other added ingredient is water. That means a product can contain only 10% juice from the fruit and 90% water, and it's perfectly legal to be called 100% juice. However, fruit drinks were among the earliest sea buckthorn products developed during last years. These drinks have market demand and consumer acceptance. They have rapidly gained a reputation as both a satisfying drink as well as a nutritional beverage that enhances stamina and vitality. Sea buckthorn based juices are also popular for export market.

**Sea buckthorn leave tea.** Picked by hand, sea buckthorn leaves are then air dried, producing a tea with a delicate, green tea flavor. An excellent and nutritional resource, sea buckthorn leaves contain most of the biologically active compounds in the fruit with even greater concentrations of flavonols and sterols. High in hydroxybenzene, the leaves are also an excellent source of important vitamins and SOD. Sea buckthorn leaves are wild and natural without pesticide. Sea buckthorn tea is a nourishing, flavourful drink. Defecated and digressed, low theine content. As health-care food, both elder and youth adapt to drink sea buckthorn tea.

The leaves contain a remarkable quantity of nutrients and bioactive substances, mainly phenolic. They contain on average 3.8% of saccharides, 0,2% of protopectin, 1% of

organic acids, 170 mg/100 g of catechin, polyphenols, carotenoid lycopene, bioflavonoids, and coumarins. The leaves also contain a significant concentration of vitamin C (up to 370 mg/100 g) and tannins (8%). In conclusion, sea buckthorn leaves are very rich in beneficial phenolic compounds, however hot water is only able to extract a minor part of the total amount in the leaves. Processing affects the extractability and is also a possible way to affect the composition of specific phenolic compounds in extracts.

Although the use of sea buckthorn tea in Armenia has a long history, nevertheless, the production of sea buckthorn tea is relatively new for consumers. Despite the gradual growing interest towards the sea buckthorn, it is not so easy to find sea-buckthorn tea in stores for now. But it can be said that the use of sea buckthorn tea gathers new momentum.

## **5. Agricultural production**

Major growing areas of Sea buckthorn in Armenia are mostly Vayots Dzor, Syunik marzes and in Sevan lake basin in Gegharkunik region.

The Sea buckthorn, one of the most important wild edible fruits widely grown in Sevan bassin, is characterized by resistance to hard environmental conditions and looks spectacular, especially in autumn and winter when it is decorated with orange berries. Climatic conditions in Gegharkunik region are suitable for the growing of the Sea buckthorn, which can be encountered in various dry areas as well as by riversides. Local people traditionally processed or preserved sea buckthorn fruits (berries). The decorative sea buckthorn shrubs/trees and berries are an important element of natural landscape in Gegharkunik region.

Wild sea buckthorn is important plant bush because it is an excellent retainer of soil. It controls erosion by trapping soil in its dense root system, and it requires very little maintenance in order to flourish.

### **Maintenance**

If the sea buckthorn plant is allowed to grow without pruning, harvesting the berries and seeds will be extremely difficult given the thorny branch structure. The branches must be kept short and neat, allowing for quick removal of the berries by shaking.

Because it naturally wild grows in cold areas like Gegharkunik region, the plant has a high resistance to frost. This eliminates the need for special protection during the winter months. It is also highly resistant to insect damage, and most animals avoid eating it.

### **Harvesting Sea Buckthorn Berries**

The sea buckthorn does not give up its nutrient-rich berries and seeds easily. Picking them by hand is very time-consuming and difficult, since the fruit is firmly attached to the branches and protected by sharp thorns, however the farmers use this type of harvesting due to lack of harvesting technical equipments. Researchers have yet to find an efficient method of mechanically harvesting berries in the field, the best methods to date collect only about half of the berries and leave the rest behind. By far the easiest way to harvest the berries is to cut down the bush, freeze the branches, and knock the berries off. People may think that this method is harmful to the plant, however, farmers said that careful trimming will actually stimulate the sea buckthorn tree to bear more fruit in two years with a result of increased production.

## **6. Demand and consumer interests**

As we enter the 21st Century, along with the recovery of global economy, and constant improvement of people's livelihood, people's consumption demands of healthy products are also becoming increasingly greater. But as for sea buckthorns, be it leaves, fruits, sea buckthorn juice, sea buckthorn oil, or sea buckthorn brass, all contain abundant nutritious values and beautifying elements. Some scholars predict that Sea buckthorn are "Health Bodyguards" of mankind in the 21st Century. This just directly reflects the broad prospect for market development of sea buckthorn products. According to the writer's prediction, in the 21st century when health is put as a priority, sea buckthorn products are sure to become another new consumption favorites by the public and numerous consumers both at home and abroad.

In a highly industrialized world, pollution, desertification, soil erosion and many other problems have become the common concern of the globe and in the meantime also chief problems faced by human beings. It is not a secret that in Gegharkunik region we have the the lowest level socio-economic indicators compared to other provinces, and the problem of poverty is more urgent here. Polls show that the priority for citizens and the population is the problem of unemployment, and they emphasize it at the level of provinces, communities and families. This means that harvesting wild growing sea buckthorn is a good opportunity for the population to solve their employment problem and get income. Sea buckthorns' good vitality, aridity-resistance, capability of checking the wind and fixing the shifting sand and other powerful environmental protection values, and their public welfare characteristics not possessed by other industries are also among the advantages conducive to implementing the brand management strategy by the sea buckthorn industry.

## Price levels

	Farmers	Retailer	Fresh market	Processing companies	Supermarket and pharmacy
<b>Fresh sea buckthorn</b>	350-400 AMD (per 1 kg)	550-600 AMD (per 1 kg)	800 (per 1 kg)	-	-
<b>Oil</b>	200 AMD (per 30 ml)	-	250 AMD (per 30 ml)	300-400 AMD (per 30 ml)	520-1680 (per 30 ml)
<b>Juice</b>	300 AMD (per 1 l)	-	350-400 AMD (per 1 l)	500-600 (per 1 l.)	800-1000 (per 1 l.)
<b>Tea</b>	-	-	-	480-800 AMD (per 100 gr)	600-1800 AMD (per 100 gr)

## Type of packaging for sea buckthorn oil, juice and tea

### Buckthorn Oil packaging

In local shops and pharmacies sea buckthorn oil is available mainly in 15, 30, 60, 120 ml in dark orange color glass containers. Sometimes you can see farmers who sell homemade sea-buckthorn oil in local fresh markets or even next to sea buckthorn fields in plastic bottles also.

### Sea Buckthorn Juice packaging

In local stores and supermarkets, sea-buckthorn juice produced by “Sis Natural” CJSC (“Yan” products), “Sipan” LLC, “Euroterm” CJSC (Noyan Premium), “Tamara Fruit” CJSC companies sell in a transparent glass bottles and also in paper containers. They are available in different volumes like 250 ml, 330 ml, 930ml and 1l.

Farmers who make homemade juices sell their products in local fresh markets, convenience store or in small foot shops near touristic places in plastic bottles.



## Sea Buckthorn tea packaging

As it was mentioned above the production of sea buckthorn tea is relatively new for consumers and it is not easy to find sea-buckthorn tea in stores for now. In any case, you can order sea buckthorn tea in some cafes.


Basically buckthorn tea is packed in paper bags or in paper containers in different volumes like 48 gr, 100 gr.

## Buyer requirements or certification requirements

Market research has shown that currently there are number of companies that produce sea buckthorn oil, juices, compotes, syrups, tea and cosmetic products. Each of these companies has the most popular type of products that consumers can always find in stores.

Here are the more famous companies, their products and organic certified versions.

## TEA

Company name	non organic	organic certified	Website
"BISON-1" Co.Ltd	-		Facebook page <a href="https://www.facebook.com/Bizon-1-LLC-1075892869169907/">https://www.facebook.com/Bizon-1-LLC-1075892869169907/</a>
"Armat" Herbal tea LLC			<a href="https://www.facebook.com/armatherbaltea/">https://www.facebook.com/armatherbaltea/</a>
Sareri Bariq SE		-	<a href="https://www.facebook.com/sareribariq/">https://www.facebook.com/sareribariq/</a> <b>comment:</b> Sareri Bariq Social Enterprises produced limited trial products of sea buckthorn tea last year, and are going

			to produce this year in larger quantities
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## JUICE

Company name	non organic	organic certified	Website
"SIS NATURAL" CJSC (Yan)	+	+	<a href="http://sisnatural.am/">http://sisnatural.am/</a>
			
"SAM-HAR" LLC (SIPAN)	+	-	<a href="http://www.sipan.am/">http://www.sipan.am/</a>
			
"Euroterm" CJSC (Noyan Premium)	+	+	<a href="http://noyan.am/">http://noyan.am/</a>
			
"Tamara Fruit" CJSC	+	+	<a href="http://www.tamara-fruit.com/">http://www.tamara-fruit.com/</a>
			

# Oil

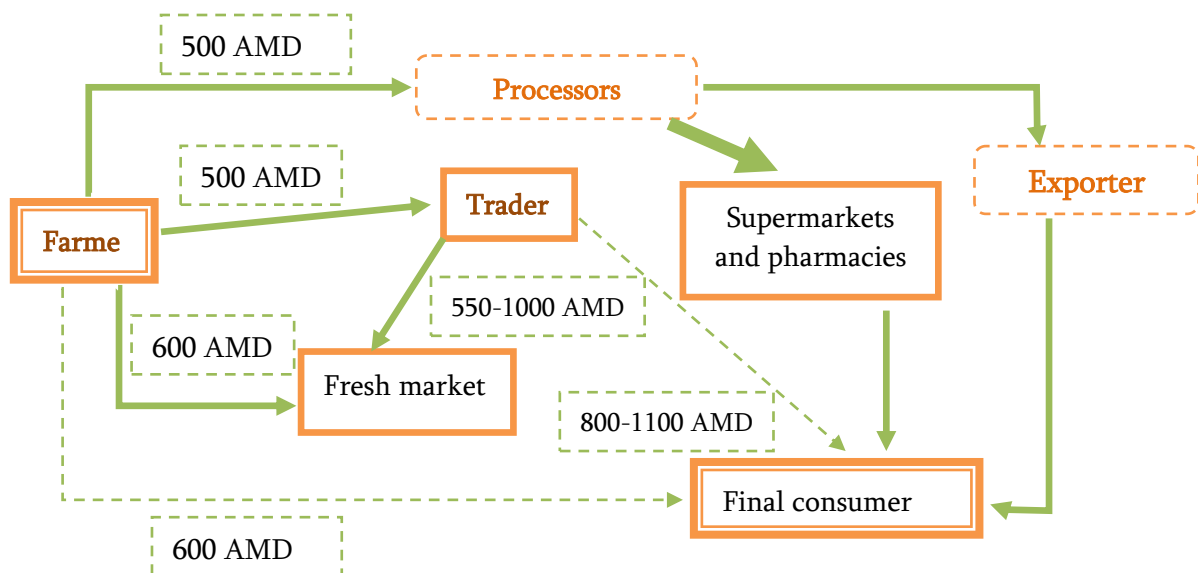
Company name	non organic	organic certified	Website
"BISON-1" Co.Ltd	-	<p>+</p> 	<p>Facebook page</p> <p><a href="https://www.facebook.com/Bizon-1-LLC-1075892869169907/">https://www.facebook.com/Bizon-1-LLC-1075892869169907/</a></p>
"NATALI PHARM" LLC	<p>+</p> 	-	<p><a href="http://natalipharm.am/">http://natalipharm.am/</a></p>
"EDA TECH" Co.Ltd	<p>+</p> 	-	-
"AMIKUS" LLC	<p>-</p> 	-	-

## 7. Value Chain Map

Farmers from Gegharkunik region says "those who are not lazy, harvesting wild growing sea buckthorn for income". Total area of wild forest of sea buckthorn in Sevan lake bassin is approximately 900 hectares by the results of 2017. And despite this only about 25-30 percent of the harvest is collected during the harvesting season.

Farmers sell fruits to local wholesale procurers/bulk buyers and retailers right after harvesting for 300-400 AMD. The farmers also supply the harvest to the existing processing companies for 500 AMD. Local wholesalers and retailers visit farmers in harvest season.

Currently there are two processing factories of sea buckthorn in Gegharkunik region. One of them has been established in Vardenis community and second one in Karchaghbyur community in 2017.



Sea buckthorn is one promising plant that got into focus of public interest. It is the wide range of applications, it's ecological promising benefits and the social-economic effect that inspire people in Gegharkunik region to deal with Sea buckthorn. Actual developments shows a growing interest not only of directly involved persons but of public in general.

Sea buckthorn is an unique and valuable plant species currently being domesticated in various parts of the world.

The species has been used to a limited extent for conservation plantings, but the use of food and non-food sea buckthorn products has not been pursued. The plants are easily propagated and yields are relatively high, and production is reliable, with the potential market mainly in Europe at the moment. Most sea buckthorn research has been conducted in

Armenia in the past. Unique plant products, especially those with proven nutritional quality, are gaining popularity in Europe. Development of an Armenian sea buckthorn industry presents a unique opportunity for agricultural production of a value-added crop on marginal land.