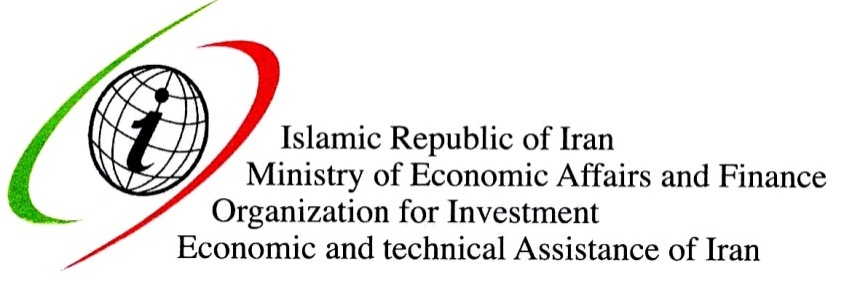
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**Pre-feasibility Study**

 **Processing of Saffron, Jujube, and Barberry**



**Project Executor:**

**Southern Khorasan Province Industrial Towns Company**

**Project Consultant:**

**Aria Tejarat Esperuz Company**

**South Khorasan Province Investment Service Center**

**Project Summary:**

South Khorasan, a semi-arid region characterized by low precipitation, hot seasonal winds, and dry air, has witnessed the resilience of certain economically valuable plant species, prompting farmers and gardeners to focus their attention on these hardy regional crops. Among the strategic agricultural products of this province, three crops stand out: saffron, jujube, and barberry .Ranking second nationally in saffron production, South Khorasan yields an impressive 46 tons of this precious spice annually. Remarkably, the province claims the top spot for jujube production in Iran, with a staggering 4,188 tons harvested each year. Furthermore, South Khorasan's barberry cultivation is unparalleled, earning it the distinction of being the leading producer not only in Iran but globally, with an annual output of 14,999 tons.The emphasis on these resilient crops can play a pivotal role in achieving sustainable development within the province. Beyond attaining self-sufficiency in food production and fostering export opportunities, this agricultural sector holds the potential to address challenges arising from population growth in Iran, ultimately contributing to a reduction in rural-to-urban migration .Saffron, a highly prized and economically valuable product, is cultivated in a handful of countries worldwide, including Iran, Spain, and Morocco, among others.

The required land area is 2,500 square meters. The electricity needed is 204,000 kilowatt-hours per year, the water needed is 1,500 cubic meters per year, and the gas needed is 10,000 cubic meters per year. This project is expected to create 16 jobs.

**Product Introduction:**

Saffron, a highly coveted spice, originates from a distinctive underground stem known as a corm. These corms are round, hard, fleshy, and plump, encased in brown fibrous skins that farmers affectionately refer to as "bulbs," though botanically they are termed "corms." Each corm can yield between one and four flowers that bloom from early November to December. Accompanying these vibrant blooms are five to eleven true leaves that typically emerge from the soil simultaneously or shortly after the flowers appear. These slender foliage can reach impressive lengths of 30 to 40 centimeters and widths ranging from 1.5 to 2 millimeters. Saffron is available in various forms, including powder, tablets, and spray.

The jujube, a thorny tree belonging to the genus Zizyphus and the species jujuba, boasts both cultivated and wild varieties found throughout Iran, Afghanistan, China, India, and Algeria. Its natural habitat is considered to be the Middle East, particularly Iran and Afghanistan. Renowned for its resilience to extreme temperatures, the jujube possesses an extraordinary adaptability to harsh climatic conditions and diverse soil types, enabling its cultivation to expand into cooler regions. While it can be found thriving in most villages around Birjand and even on poor-quality lands, the jujube yields better and more abundantly when cultivated in fertile soils with proper irrigation. Depending on the location, this hardy tree can soar to heights of 6 to 10 meters. Beyond being consumed fresh and dried, the versatile jujube can be processed into a wide array of products, including sweetened, smoked, canned, jam, soda, marmalade, essence, beverages, powder, tea, food flavoring, fruit leather, and even jujube seeds.The barberry, scientifically known as Berberis vulgaris from the Berberidaceae family, is a plant that can reach towering heights of 9 feet and features grayish branches adorned with needle-like serrations on its leaves. Between the months of March and May, light yellow buds and flowers emerge, eventually transforming into a vibrant cherry-red hue in autumn as they grow into curved bushes.

**Product Name and Code (ISIC 3):**

The relevant ISIC codes for saffron, jujube, and barberry products are presented in the following table:

|  |  |  |
| --- | --- | --- |
| **Row** | **Product Name** | **ISIC Code** |
| 1 | Saffron (agriculture) | 0113412353 |
| 2 | Various saffron products | 1549312384 |
| 3 | Saffron powder | 1549412385 |
| 4 | Saffron tablets | 1549412386 |
| 5 | Saffron spray | 1549412387 |
| 6 | Jujube (agriculture) | 0113512374 |
| 7 | Dried jujube | 1513512603 |
| 8 | Jujube (medicinal syrup) | 2423515497 |
| 9 | Jujube powder | 1531412401 |
| 10 | Dried barberry | 1513512503 |
| 11 | Barberry juice from concentrate, non-carbonated | 1513512512 |
| 12 | Barberry juice from fresh barberries | 1513512561 |
| 13 | Barberry jam | 1513512318 |
| 14 | Barberry syrup | 1513612523 |
| 15 | Barberry concentrate | 1549412484 |

**Necessity of project implementation:**

South Khorasan's climate is semi-arid, characterized by scarce rainfall, hot seasonal winds, and low humidity. Certain economically valuable plant species have demonstrated resilience in this region, leading farmers and gardeners to focus their efforts on cultivating these hardy regional crops.Among the strategic agricultural products of this province are three key crops: saffron, jujube, and barberry. South Khorasan ranks second nationally in saffron production, yielding 46 tons annually. It holds the top national position for jujube, producing an impressive 4,188 tons a year. Remarkably, the province leads both nationally and globally in barberry production, with an annual output of 14,999 tons. Emphasizing these crops can play a vital role in achieving sustainable development within the province. In addition to attaining self-sufficiency in food production and facilitating exports, this sector can address challenges stemming from population growth in the country and contribute to mitigating rural-to-urban migration.Saffron is an economically valuable crop cultivated in a few countries, including Iran, Spain, Morocco, and others. Statistically, Iran’s production can be considered nearly equivalent to global production, as the share of other countries pales in comparison. However, despite accounting for over 90% of the world’s saffron output, Iran is not recognized as the largest producer and exporter of this spice; that distinction is often attributed to Spain.Saffron possesses unique characteristics that give it a special status: the ability to be cultivated for 7 to 10 years in a single planting cycle, adaptability to grow in clay and sandy soils, an extended shelf life, ease of transportation, lack of need for heavy agricultural machinery, and a high price in the non-oil export market, contributing to foreign exchange earnings. Regarding barberry and jujube, their applications in the food and pharmaceutical industries, along with their potential for job creation and added value, render them highly important as well. Therefore, considering the vast volume of gardening and agricultural products in the region, the establishment of a processing unit that produces diverse and durable products is considered a priority for investment, as the available information supports this endeavor.

**Saffron's Versatile Applications:**

Food Industry: Saffron is widely employed in modern food technology and manufacturing processes. Various food plants utilize it to produce sausages and margarine. Dairy factories incorporate saffron into butter, cheese, and other dairy products. It is used in confectioneries, chocolates, cake mixes, distilled beverages, and desserts, serving as a natural and healthy flavoring and coloring agent. Saffron finds its way into cold and hot beverages like saffron syrup, saffron tea, saffron milk, jellies, ice cream, chocolates, candies, cakes and pastries, crisp powder mixes, and more. Beyond everyday cooking recipes, it is also used in meat product factories, dairy product facilities, cake and cake mix factories, jelly and pastry plants, and soda and beverage factories. Saffron enhances the flavor of soups, seafood dishes, various rice and chicken dishes, as well as desserts and beverages.

**Industrial Applications:**

Paint industries

Perfume and fragrance industries

Restoration and preservation of sensitive artworks

- Storage

Candle-mmaking

Jujube fruit has garnered significant attention for its important applications in the clinical, medical, veterinary, pharmaceutical, and cosmetic industries.

**Barberry Applications:**

Food industries

Pharmaceutical industries

Cosmetic and hygiene industries

Textile industries

**Import and Export Trends:**

Based on field studies, due to domestic production of saffron, jujube, and barberry during 218–2022, no imports occurred except for 16 tons of saffron powder in packages less than 10 grams imported in 2018 under tariff code 9102020.

**The amount of export of plan products during the years 2018 to 2022 (saffron)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **Export amount (tons)** | **Rial value (million Rials)** | **Dollar value (thousands of dollars)** |
| 2018 | 114 | 4،873،666 | 165،278 |
| 2019 | 198 | 8،796،158 | 277،943 |
| 2020 | 236 | 11،311،227 | 325،650 |
| 2021 | 280 | 21،795،378 | 351،127 |
| 2022 | 350 | - | - |
| **Average** | **236** | **11،694** | **280،000** |

**The amount of export of plan products during the years 2018 to 2022 (jujube)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **Amount of fresh jujube export (tons)** | **Total dry fruit export** | **Export amount of dried jujube (tons)** | **Total exports** |
| 2018 | 185 | 2514 | 25 | 210 |
| 2019 | 169 | 4512 | 45 | 214 |
| 2020 | 89 | 2352 | 24 | 113 |
| 2021 | 159 | 3101 | 31 | 190 |
| 2022 | 154 | 3268 | 33 | 187 |
| **Average** | **151** | **3149** | **32** | **183** |

**Checking and determining the minimum economic capacity**

1. **Fixed project costs**

|  |  |  |
| --- | --- | --- |
| **Row** | **Description** | **Total (million Rials)** |
| 1 | Land | 3625 |
| 2 | Landscaping | 5748 |
| 3 | Building | 33735 |
| 4 | equipment and machinery | 13096 |
| 5 | facilities | 8568 |
| 6 | Means of transportation | 1500 |
| 7 | Office supplies and services | 780 |
| 8 | Unforeseen expenses | 8307 |
| 9 | Pre-operation costs | 4634 |
| **Total** | | **79994** |

* 1. **Land**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Row** | **Description** | **area (square meter)** | **Unit price (Rials)** | **Total (million Rials)** |
| 1 | Land | 2500 | 1450000 | **3625** |
| **Total** | | ----- | ------ | **3625** |

## **1-2- Landscaping**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Row** | **Description** | the unit | Required area | Price per square meter | Total cost (million Rials) |
| 1 | Landscaping | Square meters | 250 | 3,950,000 | 988 |
| 2 | street | meters long | 94 | 19,850,000 | 1,861 |
| 3 | Fencing | Meter | 200 | 7,000,000 | 1,400 |
| 4 | entrance door | number | 1 | 1,500,000,000 | 1,500 |
| **Total** | | | | | **5748** |

**1-3-** **Building**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Row** | **Description** | Required area | Price per square meter | Total cost (million Rials) |
| 1 | production shed | 800 | 31,200,000 | 24,960 |
| 2 | office building | 100 | 48,000,000 | 4,800 |
| 3 | Kagari and welfare and security building | 100 | 39,750,000 | 3,975 |
| **Total** | | | | **33735** |

**1-4- equipment and machinery**

|  |  |  |  |
| --- | --- | --- | --- |
| **Row** | **Description** | **Number** | **Total amount (million Rials)** |
| 1 | Saffron packaging and processing line | 1 | 5,960 |
| 2 | Barberry packaging and processing line | 1 | 2,536 |
| 3 | Jujube packaging and processing line | 1 | 4,600 |
| **Total** | | | **13,096** |

**1-5- Facilities and branches**

|  |  |  |
| --- | --- | --- |
| **Row** | **Description** | **Total amount (million Rials)** |
| 1 | electrical facilities | 3,209 |
| 2 | Water plants | 1,240 |
| 3 | Gas facilities | 913 |
| 4 | Cooling and heating facilities | 1,360 |
| 5 | Security and fire alarm facilities | 1,846 |
| **Total** | | **8,568** |

**1-6- Equipment and means of transportation**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Row** | **Description** | **Number** | the unit | **Total cost (million Rials)** |
| 1 | Mazda van | 1 | device | 1500 |
| **Total** | | | | **1500** |

**2- Estimating the running costs of the project**

|  |  |  |
| --- | --- | --- |
| **Row** | **Description** | **Amount (million Rials)** |
| 1 | Cost of raw materials | 70311 |
| 2 | The cost of salaries and wages | 9302 |
| 3 | Energy costs (water, electricity, fuel, etc.) | 424 |
| 4 | maintenance cost | 2548 |
| 5 | Depreciation expenses | 6292 |
| 6 | Unforeseen costs (6% of production) | 4772 |
| 7 | Facility fees received | 117000 |
| **Total** | | **210649** |

**2-1- Cost of raw materials**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Row** | **Description** | **unit** | **place of supply** | **Consumption rate at 100% capacity** | **unit costs** | **Total (million Rials)** |
| 1 | Fresh barberry | Ton | Internal | 125 | 75,000,000 | 9,375 |
| 2 | Fresh jujube | Ton | Internal | 125 | 175,000,000 | 21,875 |
| 3 | Unprocessed saffron | kg | Internal | 1,000 | 37,000,000 | 37,000 |
| Others (Equivalent to 1% of raw materials.) | | | | | | 683 |
| Packaging (equivalent to 2% of raw materials) | | | | | | 1,379 |
| **Total** | | | | | | 70,311 |

**2-2- The cost of salaries and wages**

Non-productive personnel

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Row** | Side | required (person) | plural (person) | Monthly salary (riyals/person) | Total annual salary (million Rials) |
| 1 | CEO | 1 | 1 | 38,000,000 | 456 |
| 2 | Administrative Officer | 1 | 1 | 28,000,000 | 336 |
| 3 | Financial officer | 1 | 1 | 28,000,000 | 336 |
| 4 | Sales clerk | 1 | 1 | 30,000,000 | 360 |
| 5 | Services | 1 | 1 | 26,000,000 | 312 |
| **Total** | | 1800 | 5 | - | 1800 |
| Job benefits, insurance and bonuses (70 percent) | | | | | 1260 |
| **Total** | | | | | **3060** |

\* Production personnel

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Row** | Side | required (person) | plural (person) | Monthly salary (riyals/person) | Total annual salary (million Rials) |
| 1 | production manager | 1 | 1 | 34,000,000 | 408 |
| 2 | supervisor | 1 | 1 | 32,000,000 | 384 |
| 3 | Driver | 1 | 1 | 28,000,000 | 336 |
| 4 | worker | 4 | 4 | 26,000,000 | 1,248 |
| 5 | skilled worker | 2 | 2 | 28,000,000 | 672 |
| 6 | Services | 1 | 1 | 26,000,000 | 312 |
| 7 | guarding | 1 | 1 | 26,000,000 | 312 |
| **Total** | | 11 | 11 | **-** | - |
| Job benefits, insurance and bonuses (70 percent) | | | | | 2,570 |
| **Total** | | | | | 6,242 |

**2-3- Estimation of energy and water consumption**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Row** | **Description** | **unit** | **Annual consumption** | **Unit cost (Rials)** | **Annual consumption cost (million Rials)** |
| 1 | Electricity consumption | kilowatt hours | 204,000 | 1,980 | 404 |
| 2 | consuming water | cubic meter | 1,500 | 5,830 | 9 |
| 3 | Consumable gas | cubic meter | 10,000 | 1,100 | 11 |
| **Total** | | | | | **424** |

**2-4- Repair and maintenance**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Row** | **Description** | The amount of investment (million rials) | Maintenance percentage | Depreciation cost (million Rials) |
| 1 | Building and grounds | 39,483 | 2% | 790 |
| 2 | equipment and machinery | 13,096 | 4% | 524 |
| 3 | facilities | 8,568 | 10% | 857 |
| 4 | vehicles | 1,500 | 20% | 300 |
| 5 | Furniture and office supplies | 780 | 10% | 78 |
| **Total** | | 63,427 | **-** | 2,548 |

**2-5- Depreciation**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Row** | **Description** | The amount of investment (million rials) | Depreciation percentage | scrap rate | Depreciation cost (million Rials) |
| 1 | Building and landscaping | 39,483 | 7% | 10% | 2,764 |
| 2 | equipment and machinery | 13,096 | 10% | 10% | 1,310 |
| 3 | facilities | 8,568 | 10% | 10% | 857 |
| 4 | vehicles | 1,500 | 25% | 10% | 375 |
| 5 | Furniture and office supplies | 780 | 20% | 10% | 156 |
| 6 | Unforeseen expenses | 8,307 | 10% | 10% | 831 |
| **Total** | | **71735** | - | **-** | **6292** |

**2-6- The cost of received facilities**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Row** | **Description** | Amount (million Rials) | interest rate | Annual profit (million Rials) |
| 1 | Long-term facilities | 67,200 | 18 | 35202 |
| 2 | Short term facilities | 49,800 | 18 | 8964 |

**3- Investment table**

|  |  |  |
| --- | --- | --- |
| **Row** | **Description** | **Total cost (million riyals)** |
| 1 | Fixed investment | 79,994 |
| 2 | capital in circulation | 71,187 |
| **Total** | | **151,181** |

**4- Table of economic and financial indicators of the plan**

|  |  |  |
| --- | --- | --- |
| **Row** | **Description** | **Amount** |
| 1 | Net present value of total capital | 155.605million Rials |
| 2 | Fixed investment internal rate of return | 34 percent |
| 3 | Return period | 3 years |
| 4 | Fixed capital per capita | 6.001million Rials |
| 5 | Total capital per capita | 9.495 million Rials |
| 6 | Overhead percentage | 27.71 percent |
| 7 | Net profit | 40.456 million Rials |

**Pre-Feasibility Summary**

|  |
| --- |
| **general information** |
| Project title: Processing of saffron, jujube and barberry |
| Employment rate: 16 people |
| Working days: 300 |
| Use of the product: Saffron, jujube and barberry |
| **Technical study** |
| Land area: 2500 square meters |
| Main raw materials: Saffron, jujube and barberry |
| How to supply raw materials: internal |
| Electricity required: 204000 kilowatt hours per year |
| Required water: 1500 cubic meters per year |
| Required gas:10000 cubic meters per year |
| **Financial and economic study** |
| Fixed investment amount: 79994 million Rials |
| Circulating capital: 71187 million rials |
| Total investment: 151181 million Rials |
| Net present value (NPV): 155605 million Rials |
| Internal rate of return (IRR): 34 percent |
| Return on investment period: 3 years |