



Islamic Republic of Iran

Ministry of Economic Affairs and Finance

General Department of Economic Affairs and Finance of North Khorasan



The kinds of compression spring

Faruj Industrial Park

Center of Investment Services of North Khorasan

April 2021

# Summary of Technical-Economical Pre-Feasibility Study

The name: The kinds of compression spring

Sector: Industrial

Subsector: Metal Industries

ISIC code: 2899512404

The owner of:

Organization of Economic Affairs and Finance (North Khorasan)



The ADDRESS:

Iran, North Khorasan, Faruj

## Table of Contents

1	Abstract.....	4
1.1	Project Profile.....	4
2	Project Location.....	6
2.1	Province: North khorasan.....	6
2.2	The County: Faruj .....	6
2.3	The Project: The kinds of compression spring .....	7
2.4	Access to the Infrastructures .....	7
3	Technical Specifications of Plan.....	8
3.1	Product .....	8
3.2	Project's Requirements .....	8
3.3	Space and Infrastructure Required.....	9
3.3.1	Equipment and Machinery .....	10
3.3.2	Raw Material and Intermediate components.....	10
3.3.3	Management and Human Resources .....	11
4	Market Study and Competition.....	11
4.1	Examining Supply and Demand Trends .....	11
5	Financial Projection .....	15
5.1	The Cost Estimate .....	15
5.2	Break-Even Analysis.....	17
5.3	Sensitivity analysis of IRR.....	17
6	Duration of Project Operation.....	18
7	Incentives, Features and Advantages of Project .....	18

# 1 Abstract

## 1.1 Project Profile

Table 1: Summary Sheet

Project Introduction			
<b>Project Title</b>	The kinds of compression spring		
<b>Sector</b>	Industrial		
<b>Sub Sector</b>	Metal Industries		
<b>Location</b>	Iran, North khorasan, Faruj		
<b>The County</b>	Faruj		
<b>Products / Services</b>	The kinds compression spring		
<b>Annual Nominal Capacity</b>	1,230		Ton
<b>The Raw Material</b>	Rod wire 7176		
<b>Employment</b>	20		Person
<b>Land Area</b>	3,359		m <sup>2</sup>
<b>Floor Area</b>	1,580		m <sup>2</sup>
<b>Energy and Water Consumption</b>	Water Consumption	8,000	m <sup>3</sup> in year
	Electricity Consumption	240	KW
	Gas Consumption	200,000	m <sup>3</sup> in year
<b>Fixed Capital</b>	279,833		Million Rial
<b>Working Capital (The First Year)</b>	67,427		Million Rial
<b>Payback Period</b>	4.36		Year
<b>Net Present Value (NPV)</b>	329,713		Million Rial
<b>Internal Rate Of Return (IRR)</b>	44		%
<b>Modified Internal Rate of Return (MIRR)</b>	26		%
<b>Break Even Point</b>	27		%
<b>The Exchange Rate (Dolar)</b>	240,000		Rial
<b>Description</b>	In this project, all the materials related to the study of the kinds of compression spring market especially domestic and foreign supply and demand, are examined.		

*Table 2: Legal Authorizations*

Licensure Status	
Descriptions	Issuance Status
Principal Agreement (Establishment licensure)	☒
Land Allocation	☒
Environmental Inquiry	☒
Possibility of Water Supply	☒
Possibility of Electricity Supply	☒
Possibility of Electricity Supply	☒
Possibility of Gas Supply	☒

*Table 3: Total Investment*

Descriptions	Local Currency Required			Foreign Currency Required (Million Euro)	Total (Million Euro)
	(Million Rial)	Rate	Equivalent in (Million Euro)		
Fixed Capital	279,833	240,000	1.166	0	1.166
Working Capital	67,427		0.281	0	0.281
<b>Total Investment</b>	<b>347,260</b>	<b>240,000</b>	<b>1.447</b>	<b>0</b>	<b>1.447</b>

- Value of Foreign Equipment / Machinery: 0 Million Euro
- Value of Local Equipment / Machinery: 0.5796 Million Euro
- Net Present Value (NPV): 1.374 Million Euro
- Internal Rate of Return (IRR): 44 %
- Payback Period: 4.36Years

Table 4: General Information

Company Profile	
Project Type	Establishment <input checked="" type="checkbox"/>
Company Name	North Khorasan Organization of Industry, Mine and Trade
Contact Person (Name and Position)	Morteza HoseyniMasoom
Email	smt.nkh1383@gmail.com
Mobile	09153864144
Tel	05831552
Website	nkh.mimt.gov.ir
Address	North Khorasan Province, Bojnurd, North Khorasan Organization of Industry, Mine and Trade
Company's Legal Structure	Government <input checked="" type="checkbox"/>

## 2 Project Location

### 2.1 Province: North khorasan

### 2.2 The County: Faruj

Faruj is a city and capital of Faruj County, in North Khorasan Province, Iran. At the 2016 census, its population was 18,061, in 2,639 families.

This project will be construct in part 103 with coordinates (602017,4125438) in Faruj industrial park. Proposed location of project is shown in Figure 1.

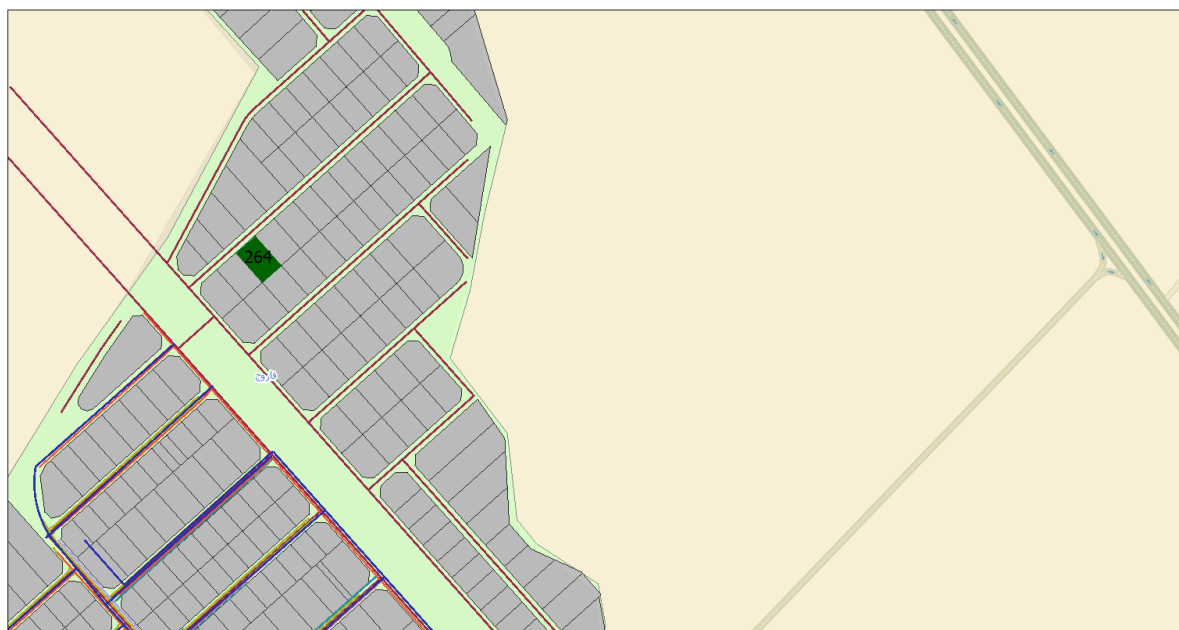


Figure 1: Location of Proposed Land in Faruj Industrial Park

### 2.3 The Project: The kinds of compression spring

### 2.4 Access to the Infrastructures

Table 5: Access to Infrastructures

No.	Needed Infrastructures	Distance to the Project	The Supply Infrastructures
1	Water	0	is provided
2	Electricity	0	is provided
3	Gas	0	is provided
4	Telecommunications	0	is provided
5	High way	1	is provided
6	Sub way	0	is provided
7	Airport	91	is provided
8	Amirabad Port (Behshahr)	508	is provided
9	Bandar Abbas Port	1,576	is provided
10	Rail way station of Joveyn	253	is provided
11	Rail way station of Jajarm	283	is provided

### 3 Technical Specifications of Plan

#### 3.1 Product

Table 6: Project Specifications Based on ISIC Code

The Project	ISIC Code	Customs Tariff	Environmental Category
The kinds of compression spring	2899512404	73202090	4

In this project, all the materials related to the study of the kinds of compression spring market especially domestic and foreign supply and demand, are examined. As the chart and table show the demand for the product, demand is upward until 2025, so that from 2020 to 2023, about 3,000 tons will be added to the country's needs. Now, if we assume that factories with a percentage of physical progress (above 75%) will be launched, the shortage of the country's demand will be 2,000 tons. It should be noted that the capacity of the factory in question is 193,000 pairs of helical compression springs, which is equivalent to about 1,300 tons, so it can be claimed that the factory can be established without the concern of selling the product. A spring is a device for storing mechanical energy that can usually be found in all devices from consumer goods to heavy industrial equipment. There are various springs such as compression springs, traction springs, torsion springs, etc. each of which has many applications around us. If you look around you will find that many products and equipment used daily, one or more springs are used. Used in aerospace, railroad, automotive, machinery, industrial equipment, nuclear power generation, telecommunications, agriculture, military, construction and mining industries.

#### 3.2 Project's Requirements

The standard (DIN 2,096) provides comprehensive information for springs. Also, according to the standards and uses, the following tests should be performed on different springs.

- Force test and spring displacement
- Hardness test
- Dimensional tests
- Montage test
- Bending test



- Fatigue and spring durability test
- Sitting resistance test
- Paint adhesion test
- Water, oil and grease resistance test
- Salt spray test
- Magnetic particle cracking test

### 3.3 Space and Infrastructure Required

Table 7: Land Purchase Costs (Million Rial)

Specifications	Area ( $m^2$ )	Price per $m^2$	Cost		
			Paid Cost	Needed Fund	Total
A piece of land in Faruj	3,150	0.65	0	0	2,048

Table 8: Site Preparation and Development Costs (Million Rial)

Description	Working Capacity	Unit	Unit Price	Paid Cost	Needed Fund	Total
Excavation	1,500	cm	0.3	0	0	450
Wall Construction & Door	$2*(48+70) = 236$	Sm	9	0	0	2,124
Street Construction (5% of the amount of Land)	168	Sm	7	0	0	1,176
5% of the Amougreen Space & Lighting (1% of the amount of Land)	34	No	8	0	0	272
<b>Total</b>				<b>0</b>	<b>0</b>	<b>4,022</b>

Table 9: Civil Works, Structures and Buildings Costs (Million Rial)

Description	Area ( $m^2$ )	Unit Price	Paid Cost	Needed Fund	Total
Production Hall	1,000	25	0	0	25,000
Raw Material Warehouse	200	30	0	0	6,000
Product Warehouse	200	30	0	0	6,000
Office Building	150	45	0	0	6,750
Guardroom	30	45	0	0	1,350
<b>Total</b>			<b>0</b>	<b>0</b>	<b>45,100</b>

Table 10: Infrastructures

No	Description	Unit	Annual Consumption	Unit Cost (Rial)	Total (Million Rial)
1	Water Consumption	$m^3$	8,000	7,000	56
2	Electricity Consumption	$Kw$	240	1,100	220
3	Gas Consumption	$m^3$	200,000	1.200	240
4	Gasoline	$Litr$	3600	3,000	110
<b>Total</b>					<b>626</b>

### 3.3.1 Equipment and Machinery

Table 11: Plant Machinery and Equipment Costs(Million Rial)

Description	Unit cost	Costs Required				Total
		Local Costs	Costs of Currency		Cost to Complete	
			Rate	(Million Euro)		
Temper Furnace	3,800	7,600	240,000	0.0317	0	7,600
Cnc Spring Coiling Machine	124,800	124,800		0.52	0	124,800
Shot Plast	2,700	2,700		0.0112	0	2,700
Miscellaneous Tools	4,000	4,000		0.0167	0	4,000
<b>Total Cost of Machinery</b>		<b>139,100</b>	<b>240,000</b>	<b>0.579</b>	<b>0</b>	<b>139,100</b>

- The exchange rate is: 1 € = 240,000 Rial

### 3.3.2 Raw Material and Intermediate components

Table 12: Raw Material and Intermediate Components(Million Rial)

Description	Unit	Total Consumption of the Raw Material	Price per Unit of Raw Material	Annual Cost of Providing Material
Raw Material & Packaging	$Ton$	-	-	64,575
Salary	$Rial$	-	-	2,310
Energy Costs (Fuel & Electricity & Water)	$L/Kw/Cm$	-	-	542
Repair & Maintenance	$Rial$	-	-	12,350
<b>Total</b>				<b>67,427</b>

### 3.3.3 Management and Human Resources

*Table 13: Salary of Administrative Staff(Million Rial)*

No.	Position	Number of Shifts	Personnel per Shift (No.)	Total Staff (People)	Monthly Salary (per Person)	Annual Salary
1	1	Manpower (in Administrative Sector)	-	7	63.21	5,310
2	2	Manpower (in Production Sector)	-	13	54.81	8,550
<b>Total</b>				<b>20</b>		<b>13,860</b>

- Number of skilled personnel required: 13
- Number of non- skilled personnel required: 7
- Total number of personnel required: 20

## 4 Market Study and Competition

### 4.1 Examining Supply and Demand Trends

The amount of internal supply or production of compression spring based on production licenses (according to the information of the ministry of industry, mine and trade) from 2015 to 2020 is as follows.

*Table 14: The Amount of Compression Spring Domestic Supply*

Year	Nominal Capacity (Ton)
2015	15,183
2016	18,271
2017	18,721
2018	18,871
2019	18,781
2020	27,581

The following chart shows the estimation of production according to Table 14 by 2025 based on linear regression.

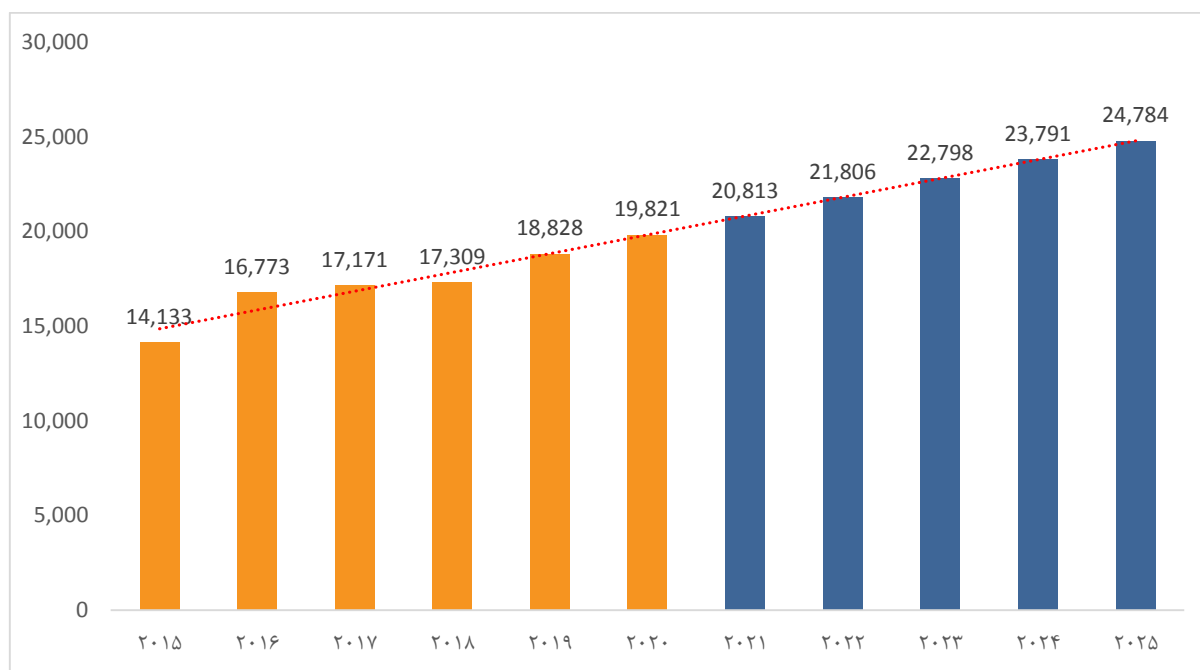


Figure 2: The Estimation of Production

As the Figure 2 shows, the country's production is up from 2021 to 2025, so there is the capacity to create new factories. The amount of imports to the country is based on the information of the Tehran Chamber of Commerce, Industries, Mines and Agriculture at <http://www.tccim.ir> according to the (There is no data for 2019 and 2020 so the information is considered as the initial data for the forecast for the coming years from 2015 to 2018) following table.

Table 15: The Amount of Imports From 2015 to 2018

Year	Customs Tariff	Imports (ton)	Countries
2015	73202090	207	China, Sweden, Germany, UAE, Italy, Turkey, Finland, Taiwan, Swiss, Spain, Denmark
2016	73202090	14	China, Turkey, Korea, Germany, UAE
2017	73202090	0	-
2018	73202090	0	-

The following chart predicts the amount of imports according to the Table 15 by 2025, It shows based on linear regression.

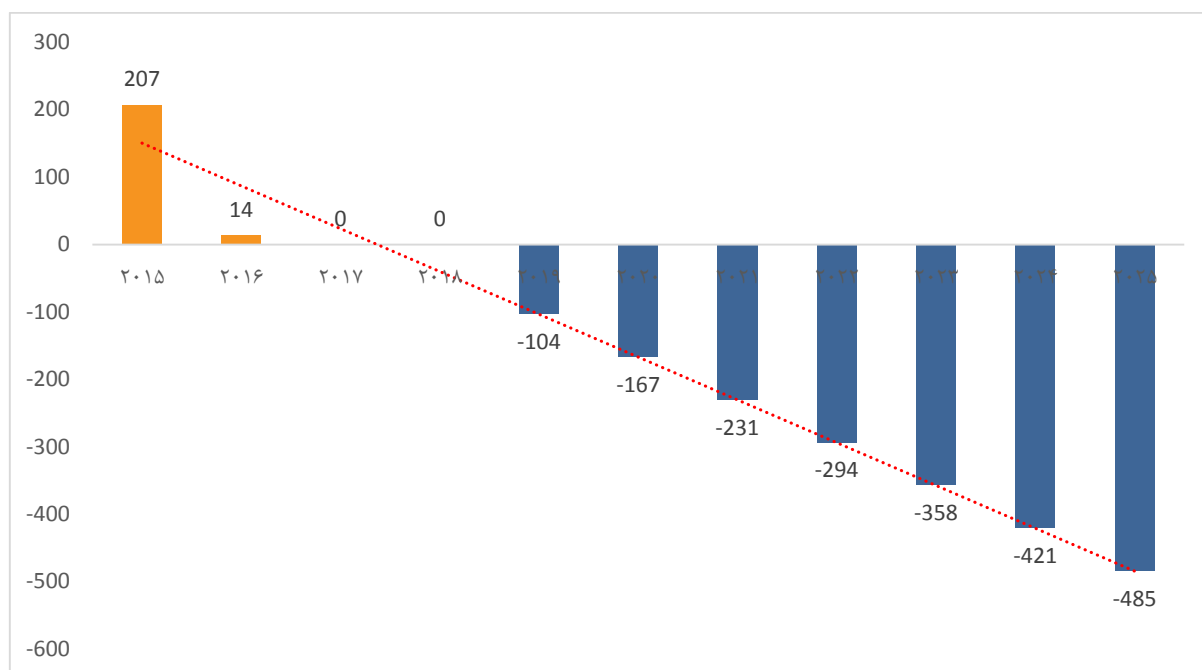


Figure 3: The Prediction of Imports

The export of this product is zero.

The amount of domestic demand that is equal to the amount of domestic production plus the amount of imports minus the amount of exports is in Table 16.

Table 16: The Amount of Domestic Demand form 2015 to 2018

Year	Demand (Tons)
2015	14,133
2016	16,773
2017	17,171
2018	17,309

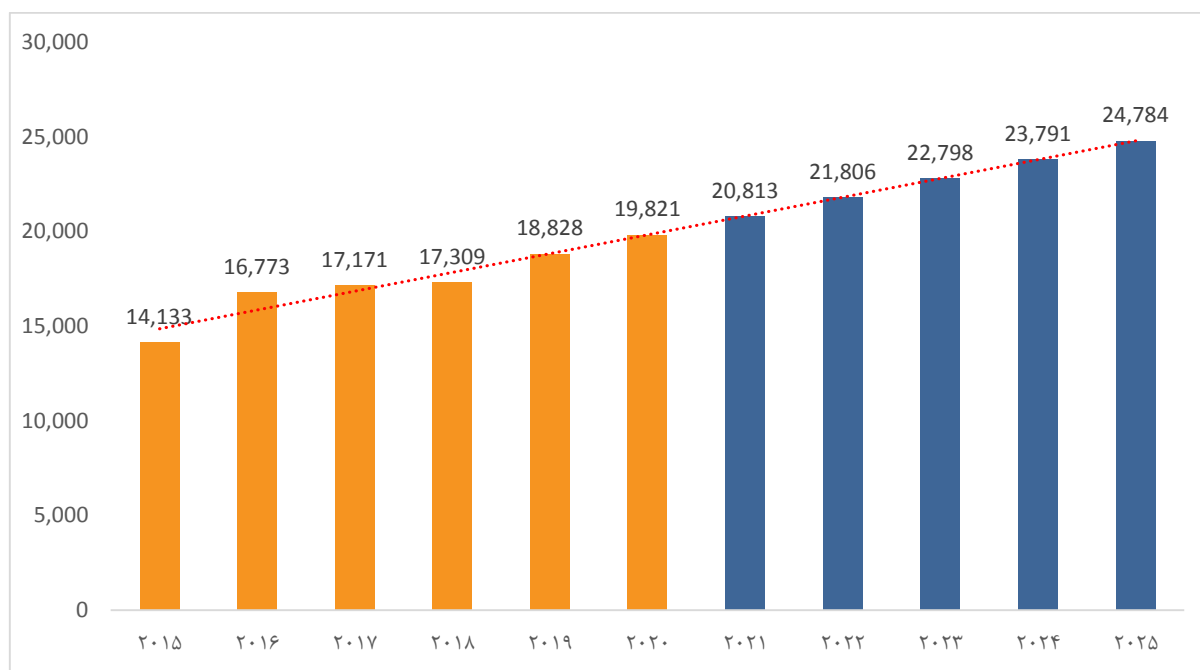


Figure 4: The Estimation of Domestic Demand from 2021 to 2025

Internal demand forecast from 2021 to 2025 is presented in the Table 17.

Table 17: The Estimation of Domestic Demand form 2021 to 2025

Year	The Prediction of Demand
2019	18,828
2020	19,821
2021	20,813
2022	21,806
2023	22,798
2024	23,791
2025	24,784

As the Figure 4 and Table 17 shows, the amount of domestic demand is increased. In the Table 18, the information of the units that have obtained a liscence is provided based on the amount of progress according to the information of the ministry of Industry, Mine and Trade.

*Table 18: The Amount of Progress of Units that have Lisence*

Progress Percent	Capacity (Ton)
0% - 25%	50,921
25% - 50%	1,000
50% - 75%	19,920
75% - 100%	1,000

As the chart and table of the demand of the product shows, demands are up until 2025, with about 3,000 tons added to the country's need from 2020 to 2023. Now if we assume factories with a percentage of progress above 75% reach production ( in this plan is 1,000 tons), the country's demand will be 2,000 tons. The factory's capacity is 193,000 pairs of compression spring, which is equivalent to about 1,300 tons, so it can be claimed that the factor can be established without the concern of selling the product.

## 5 Financial Projection

### 5.1 The Cost Estimate

*Table 19: Total Investment (Million Rial)*

No.	Subject	Cost
1	Fixed Capital	279,833
2	Working Capital	67,427
<b>Total Investment</b>		<b>347,260</b>

Table 20: Fixed Capital (Million Rial)

Subject	Paid Cost	Cost Required				Total cost
		local Cost	Foreign Exchange Cost		Needed Fund	
			Rate	(M€)		
Land Purchase	0	2,015	240,000	0.0084	0	2,015
Landscaping	0	4,022		0.0167	0	4,022
Building	0	45,100		0.1879	0	45,100
Equipment & Machinery	0	139,100		0.5795	0	139,100
Laboratory & Workshop Supplies & Equipment	0	5,639		0.02349	0	5,639
Facilities	0	27,295		0.114	0	27,295
Transportation	0	11,900		0.0496	0	11,900
Office & Services Equipment	0	1,297		0.0054	0	1,297
Pre-Operation Costs	0	18,026		0.0751	0	18,026
Unforeseen (10% of the above Items)	0	25,439		0.10599	0	25,439
<b>Total Fixed Investment</b>	<b>0</b>	<b>279,833</b>		<b>240,000</b>	<b>1.166</b>	<b>0</b>

Table 21: Working Capital (Million Rial)

Subject	Day	Total
Packaging Material (2 Months Raw Materials and Packaging)	60	64,575
Salary (2 Months Salary)	60	2,310
Imprest Fund (15 Days of Water, Electricity, Fuel and Repair Costs)	15	542
<b>Total</b>		<b>67,427</b>

Table 22: Fixed and Variable Costs

No.	Production Cost	Fixed Cost		Variable Cost	
		%	Cost	%	Cost
1	Raw Material	0	0	100	387,450
2	Energy & Utility	20	131	80	526
3	Repair & Maintenance	20	2,470	80	9,880
4	Production Salary	70	9,702	30	4,158
5	Depreciation	100	25,104	0	0
<b>Total Production Costs</b>			<b>37,407</b>		<b>402,014</b>



## 5.2 Break-Even Analysis

Table 23: Break-even Analysis

Period	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Break-even ratio (%)	27.03	25.38	23.88	22.52	21.14	19.06	18.14	17.30	16.53	15.84

## 5.3 Sensitivity analysis of IRR

Table 24: Sensitivity Analysis of IRR

Variation (%)	Sales Revenue	Increase in Fixed Assets	Operating Costs
-20.00%	5.54%	52.78%	68.11%
-16.00%	15.47%	50.84%	63.54%
-12.00%	23.61%	49.05%	58.90%
-8.00%	30.94%	47.40%	54.18%
-4.00%	37.84%	45.87%	49.36%
0.00%	44.44%	44.44%	44.44%
4.00%	50.84%	43.11%	39.40%
8.00%	57.06%	41.87%	34.20%
12.00%	63.14%	40.70%	28.80%
16.00%	69.09%	39.60%	23.09%
20.00%	74.91%	38.57%	16.91%

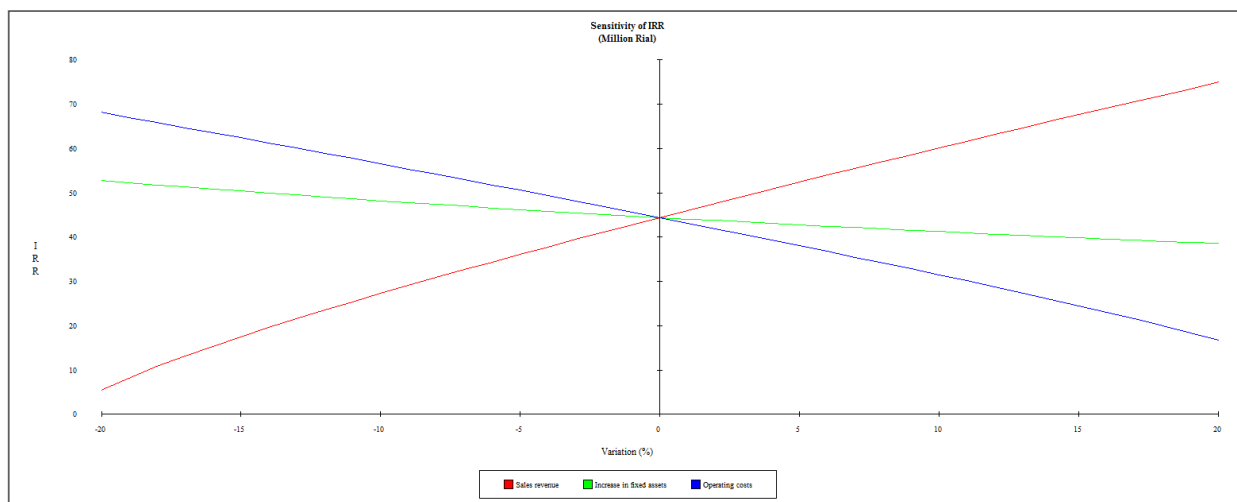


Figure 5: Sensitivity Analysis of IRR

## 6 Duration of Project Operation

The time of doing early stages and completing its process is about 21 months.

Table 25: Action Plan and Implementaion Schedule

Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Land Purchase	■	■																						
Constructing Buildings		■	■	■	■	■	■	■	■	■	■	■	■	■	■									
Execution of Facilities										■	■	■	■	■	■	■	■	■	■	■	■			
Order, Purchase of Machinery										■	■	■	■	■	■	■	■	■	■	■				
Landscaping														■	■	■	■	■	■	■				
Machinery Strat-up & Trial Production																		■	■	■	■	■		

## 7 Incentives, Features and Advantages of Project

North Khorasan Province is a province located in northeastern Iran. Bojnord is the capital of the province. This province contains many historical and natural attractions, such as mineral water springs, small lakes, recreational areas, caves and protected regions, and various hiking areas. Advantages of the agriculture of this province involves favorable and diverse climatic conditions and other parameters affecting growth.