General Department of
Economic and Financial Affairs of Khuzestan

Preparation and Compilation of Investment Opportunities in The Province

Investment Opportunity Studies Report

Farming Fish in Cages in Mahshahr Bay

(Attachment Number 1)

Date: 2023/04/21

V2

In the name of God

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Tables and Figures

1) Location of the project

1-1- Province

Khuzestan province is located in the southwest of Iran (in 47° 42′ to 50° 39′ east of the Greenwich meridian and 29° 58′ to 32° 58′ north of the equator). The area of Khuzestan province is 63,238square kilometers. With a population of 4,994 thousand people in 1400SH, it is the fifth most populous province in Iran (after Tehran, Khorasan Razavi, Isfahan and Fars provinces). **Ahvaz** is the capital of Khuzestan province and is located in the 880km of Tehran. This province is bordered by ILAM province from the northwest, Lorestan province from the north, CHAHARMAHAL and BAKHTIARI, KOHGILUYEH and BOYERAHMAD provinces from the northeast and east, the Persian Gulf (330km long) from the south and Iraq (330km long) from the west. The location of Khuzestan is in the west of Zagros mountains. Due to the vastness of its plains, the border with Iraq and the Persian Gulf, and the distance from other provincial centers have placed this province in a strategic position.

Figure (1): The Province location in Iran


Figure (2): Location map of Mahshahr in Khuzestan

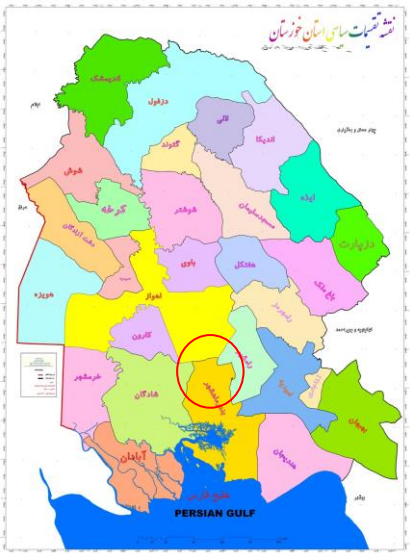


Figure (3): Political divisions of Khuzestan province

1-2- County

According to the latest national divisions of 1401 of the Ministry of Interior, this province has 29 counties, 70 districts, 145 villages, 90 cities and 3 special governorates. The latest political divisions of the province are described in figure (3). **Bandar Mahshahr city** is one of the cities of Khuzestan province, centered in Bandar Mahshahr city. Mahshahr city, with a population of over 300 thousand people, has 6% of the province's population. This city has a common border with Hendijan, OMIDIYEH and RAMSHIR cities from the east, Shadgan city from the west, Ahwaz city from the north, and the Persian Gulf from the south. This city is located 18 km from Imam Khomeini Port, 95 km from Abadan and 110 km from Ahvaz. The city of Bandar Mahshahr is located in the arid and extra-arid geographical region and is located in a wide and flat area with an area of 591 thousand hectares in plain district. The rapid increase in temperature in spring makes the nature of the area dry and rough and the value of the pastures decreases drastically. The city of Bandar Mahshahr is located in the plains of Khuzestan, and it is not very rough, low and high, and is mostly flat. The weather in Mahshahr is hot and humid. Its temperature varies between 50 degrees in summer and zero degrees in winter. Humidity in Mahshahr is a severe and annoying such that Humidity in the summer the relative reaches 100%. The average rainfall in this area is 195 mm. Due to its saline and alkaline soil, Mahshahr port has a weak vegetation cover, and KONAR and GAZ trees are scattered there.

Mahshahr is a port and industrial city and the highway of land, sea and rail transit routes for goods from the important and strategic port of Imam Khomeini, and the most important industries of Mahshahr are petrochemicals and shipping. The presence of water borders and proximity to Iraq and Kuwait have made this region an important industrial and import and export point. The economic activity and development of Mahshahr port is mostly based on its port capability and proximity to the coasts, as well as the proximity to the oil and gas resources of the Khuzestan plain and related activities. This city, with the construction of the oil and goods export port and after that, the petrochemical construction of Bandar Imam Khomeini and also with the creation of a special petrochemical economic zone (in which industries are subject to customs facilities for importing goods) and the construction of huge petrochemical industries, has caused this city to be a city that can be immigrated and has a high density. In this city, the cultivation of agricultural products is highly dependent on irrigation. Its main products are wheat, barley, beans, dates, grapes, pomegranates and figs. There are no special crafts and workshops in it.

2) Project Status

The fish breeding plan in the cage is defined in Mahshahr Bays collection. The term estuary (XOWR) (Bay) refers to a branch of the sea that has entered the land. In fact, the bay is a semi-closed area of water and therefore it is a small gulf. Some bays are the entrance of the river to the sea, and inside them, the sea water is significantly diluted by river water or fresh water. This type of Bays is called an estuary. Bandar Mahshahr is one of the few cities in Iran that has a Bay (a branch of the sea on land), the most important of which is Musa Bay, which is very important from a strategic and economic point of view.

Figure (4): Project location map

Other small bay branches off from Musa Bay, which are mostly located on its western side, and from south to north, they are SELECH Bay, MELH Bay, QANAQE Bay, MERYMOS Bay, and DURAQ Bay in the northwest. The part that is located between the island of QABRE NAKHODA and the eastern shore of the main land is called GHAZLAN Bay.

2-1- Access to infrastructures

Currently, there are electrical infrastructures in Mahshahr Bays. This area is 10 km away from Mahshahr city. The nearest port to this area is the export port of Mahshahr at a distance of 3 km, the nearest railway station (Imam Port Railway) is located at a distance of 21 km, and the nearest airport (Mahshahr) is located at a distance of 11 km.

Table (1): access to infrastructures

No.	Required Infrastructure	Distance From Project Status(km)	Location Of Infrastructure Provision
1	Water	0	Persian Gulf
2	Electricity	0.4	-
3	Gas	-	It is not predicted
4	Telecommunication	-	It is not predicted
5	Main road	12	Mahshahr - Hendijan
6	Side road	3	Mahshahr road
7	Airport	11	Mahshahr Airport
8	Port	3	Mahshahr port
9	Railway Station	21	Bandar Imam railway

Figure (5): Access routes to the project

3) Technical specifications of the project

3-1- Product

Sea bass fish: Barramundi fish or Asian Sea bass is a species of migratory fish and belongs to the large perch family and belongs to the group of perch fishes. The species of this fish are widely distributed in the Indo-Pacific region, from South Asia to Papua New Guinea and northern Australia. Sea bass fish is one of the important species of farmed fish that can adapt to both salt and fresh water environments. This fish is considered one of the best types of farmed fish due to its fast growth, easy reproduction, high salt tolerance and ability to accept formula food, and it reaches 500 to 600 grams in 5 months. This fish can be raised both in earthen pools and in sea cages.

SOBEITY seabream: SOBAITY seabream is a carnivorous fish and feeds on all kinds of fish, crustaceans, and invertebrates. The maximum length of this fish is 50 cm and its usual size is 20 cm. This fish has a high economic value and it is widely cultivated in the Persian Gulf. This fish is native to the Persian Gulf, Indian Ocean and coastal waters of India. SOBEITY fish is one of the most delicious fish in the south. SOBEITY fish meat is crispy and has a very good taste. SOBEITY fish has few blades and its blades can be easily separated. This fish is the best fish in the SHANAK fish family.

Sea bass is one of the carnivorous Asian species that can be farmed in Iranian marine farms, which, in addition to its fast growth and the ability to adapt to environmental conditions, has a good market inside and outside the country.

SHANAK fish: Yellow-fin SHANAK fish which is also called yellow-tail silver SHANAK fish, belongs to the SHANAK fish family. As its name suggests, this fish has yellow abdominal and tail fins, and its body color is a combination of silver and gray. The Latin names of yellowfin seabream are Yellowfin Seabream, Yellow Seabream and Gray Bream.

Yellowfin shank fish is one of the valuable fish in the field of economy, health and treatment; With a lot of meat and a very small blade, it is one of the species that is very suitable for breeding and is very popular among the people of the south.

Figure (6): A picture of a Sea bass fish

Figure (7): A picture of SOBEITY fish

Figure (8): A picture of SHANAK fish

3-2- Project Requirement

3-2-1- Land And Required Infrastructure

To breed fish in a cage with a capacity of 2000tons per year, 50 cages of 50 tons with a practical production capacity of 43 tons (with a diameter of 20 meters and a depth of 10 meters) are needed. The specifications of the land, main buildings and other required side buildings and investment in them are as described in the table below.

Table (2): Amount of investment in land, landscaping and building

No.	Requirements	Description	Investment Required		Total Cost (Million Rials)
			Required Area	Unit Price of Purchase/Construction	
1	Construction	Aquatic feed warehouses in mortgage form	1,000	1,000,000	1,000
		Administrative and central management building	24	100,000,000	2,400
		labor and supporting Conex	12	100,000,000	1,200
		Conex and equipment warehouse	6	100,000,000	600
		Guard and janitor Conex	12	100,000,000	1,200
		Platform and canopy for unloading and loading catch	120	9,000,000	1,080
Total			-	-	7,480

3-2-2- Machinery and Equipment

Based on the weather conditions, water depth, water temperature and other conditions of Mahshahr Bays, fish farming equipment in cages for breeding Sea bass, SOBEITY and SHANAK fish are needed as follows. All equipment can be produced in the country.

Table (3): Plant Machinery and Equipment

No.	Equipment/Machinery	Required investment			Total cost (Million Rials)
		Amount	Purchase Price	Currency	
1	The floating part of the cage (polyethylene pipes, brackets, floats, etc.)	50	7,000	(Million Rials)	350,000
2	Restraint system (anchor and chain, ...)				
3	Types of nets (main, protective and anti-bird)				
4	Fiberglass fish breeding ponds and other related equipment	33	350	(Million Rials)	11,433
5	barge (floating)	2	10,000		20,000
6	Barge restraint system	2	300	(Million Rials)	600
7	Feeding system equipment on the barge	2	1,000	(Million Rials)	2,000
8	work boat (service)	1	1,200	(Million Rials)	1,200
9	net washing (machine)	1	500	(Million Rials)	500
10	sorter - fish counter (60 thousand per hour)	1	300	(Million Rials)	300
11	Waste collection system	1	500	(Million Rials)	500
12	Security system (camera), remote monitoring and control system and subsurface monitoring system	1	3,000	(Million Rials)	3,000
13	Environmental data receiving system	1	2,000	(Million Rials)	2,000
14	All types of pumps and screeds	3	80	(Million Rials)	240
15	Generator -80KV	1	3,000	(Million Rials)	3,000
16	Plastic pallet	100	7	(Million Rials)	700
17	Other main equipment - Internal	1	14,527	(Million Rials)	14,527
Total		-	-	-	**410,000**

Table (4): Auxiliary and service plant Equipment

No.	Equipment/Machinery	Unit of measurement	Type of equipment	Required investment		Total cost (Million Rials)
				Amount	Unit Price (Million Rials)	
1	Distribution Of Electricity / Demand Price	Kw	Facility	30	6	180
2	Several Electrical Cables	M	Facility	500	4	2,000
3	Electrical equipment of the lighting system	Amount	Facility	10	40	400
4	The Cost of Panel Boards and Related Electrical Equipment	Amount	Facility	2	320	640
5	Water purifier	M	Facility	1	100	100
6	Drinking water pump and pumping equipment	Machine	Facility	1	150	150
7	Water tank (10000 liters)	Amount	Facility	1	400	400
8	fuel tank	M		1	150	150
9	Human sewage transfer route	M	Facility	100	1.5	150
10	Human sewage disposal well	M	Facility	1	250	250
11	Firefighting, safety and health equipment and...	Capsule	Facility	8	30	240
12	Air conditioner	Set	Facility	1	850	850
13	Nissan Cargo	Machine	Vehicle	1	7,000	7,000
14	car	Machine	Vehicle	1	7,000	7,000
15	Other safety equipment and CCTV system of office building	Set	Facility	1	600	600
16	Office Equipment	Set	office	5	500	2,500
17	Restaurant Equipment	Set	office	11	30	315
18	Medical Equipment	Set	office	1	800	800
19	Other ancillary facilities	-	Facility	1	275	275
Total				-	-	**29,000**

3-2-3- Raw Materials

In the present plan, the main raw materials include fry and its feed. The selected fry has been calculated according to the breeding program of the selected species. A 30-gram fry of seabass is about 350,000 Rials, and the price of SOBEITY and SHANAK fry is 400,000 Rials. The amount of feed to reach the ideal weight is considered with a feed conversion ratio (FCR) equal to 1.5 for seabass, 1.7 for SOBEITY fish, and 2 for SHANAK fish. The average price of each kilo of feed is about 450,000 rials. It is worth noting; It is easily possible to supply these materials in the domestic market.

Table (5): Costs of Raw Material for Production

No.	Title	Product	Average price of unit (Rials)	conversion ratio	Amount of consumption in nominal capacity	The cost of materials at the nominal capacity (Million Rials)
1	baby fish (30 gr)	Sea bass fish	350,000	1.05	969,230.77	339,231
2	baby fish (1-3 gr) SOBEITY	SOBEITY fish	400,000	1.05	1,120,000.00	448,000
3	baby fish (1-3 gr) SHANAK	SHANAK fish	400,000	1.05	840,000.00	336,000
4	Types of aquatic feed (starting, growth and fattening) sea bass fish	Sea bass fish	450,000	1.5	945,000	425,250
5	Types of aquatic feed (starting, growth and fattening) SOBEITY fish	SOBEITY fish	450,000	1.7	1,428,000	642,600
6	Types of aquatic feed (starting, growth and fattening) SHANAK fish	SHANAK fish	450,000	2.0	1,260,000	567,000
7	medicine	All aquatics	6,000,000	-	150	900
8	Transportation	All aquatics	5,000,000	-	670	3,350
9	Types of plastic baskets/pallets (consumable)	All aquatics	1,500,000	-	30	45
Total			-	-	-	**2,762,376**

3-2-4- Management and human resource

The goal of implementing the present plan is to employ 33 human resources. Normally, 2 people are needed for each cage under normal conditions and 2 people are needed seasonally. The specifications of the required manpower are described in Table (6).

Table (6): Management and Human Resource

No	Level of skill	Number of staff	Average basic salary - Rial
1	Senior	6	163,333,333
2	Mid-level	1	100,000,000
3	Junior	26	86,153,846

Number Of Direct Mid-Level Staff Required	1	person
Number Of Direct Junior Staff Required	26	person
Number Of Direct Senior Staff Required	6	person
Total	33	person

4) Ownership and legal permissions

4-1- land ownership

The design and implementation of this project is considered in Mahshahr Bays collection. The selected bay width is specified in paragraph 2. In order to build fish cages and exploit them, documents under the title of establishment license and exploitation license (in accordance with the terms and conditions mentioned in paragraph 4-3-4) will be provided to the investor. These documents do not mean the investor's ownership of the water area and coastal lands. Based on the mentioned licenses, only the right to exploit the water zone and coastal lands is given to the operator until the continuous operation.

4-2- Intellectual Property and Concessions

Farming fish in cages in the Mahshahr Bays, according to the established standards and regulations, requires the necessary knowledge and experience in this regard. Farming fish in cages in the lake should have minimal environmental impact and reduce the water quality of the lake. Some of the rules and standards established in standard 829 are listed. The standards and criteria include the criteria of the place of establishment, environmental standards, management and breeding methods and the selection of suitable species for farming.

4-3- Legal permissions

Currently, the Fisheries Organization has conducted the necessary studies regarding fish breeding in cages in the Mahshahr Bays, and the approval of this organization is considered as a principled agreement for natural and legal persons. In order to design, build and operate cages in the water zone, as well as facilities and coastal buildings, these persons need an establishment permit from the Agricultural Engineering System Organization and the Natural Resources Organization of Khuzestan province. The license to operate the cage is a document that is issued by the Agricultural Engineering System Organization and the Natural Resources Organization of Khuzestan province after the establishment and installation of the cages in the lake and their exploitation as well as the completion of the construction. Health permit is another license that is issued by the General Department of Veterinary Medicine of Khuzestan province after the establishment of the cages and the completion of the construction, according to the regulations of the Medical Sciences Organization of the county.

In addition to the mentioned cases, the construction of a cage in the Mahshahr Bays area requires inquiries and approval from the following organizations:

- General Department of Environmental Protection of Khuzestan Province or General Department of Environmental Protection of Mahshahr county
- Regional Water Joint Stock Company of Khuzestan Province (or Mahshahr county)
- Regional Electricity Distribution Company of Khuzestan province (or Mahshahr county)
- General Department of Natural Resources and Water Resources of Khuzestan Province (or Mahshahr county)
- Management of land affairs in Khuzestan province (or Mahshahr county)

According to the provisions of the health executive regulations, it is mandatory to employ and hire at least one veterinarian doctor as a technical officer, as well as employ an expert in the number and conditions announced by the country's fisheries organization. It is worth noting; The organization of agricultural engineering system and natural resources of the province and the whole country are responsible for issuing the establishment license and exploitation license; Act according to the monitoring guidelines issued by the Iranian Fisheries Organization.

5) market research and competition

5-1- Target market introduction

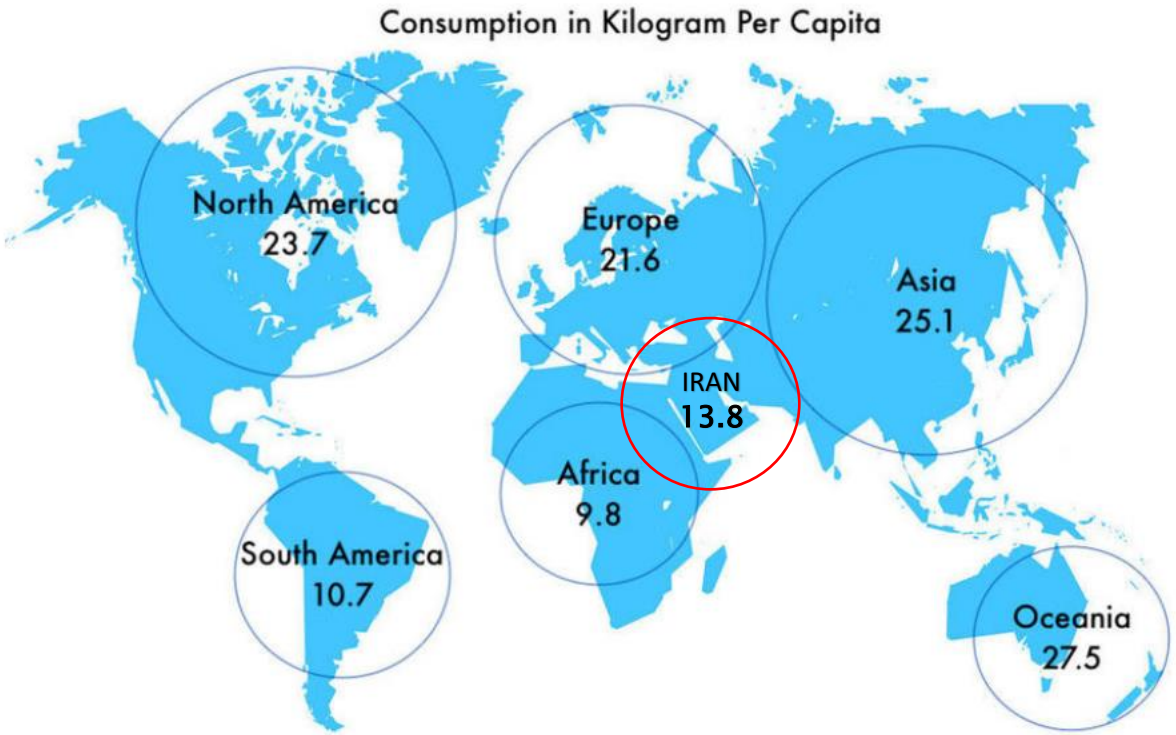
Currently, a large part of the aquatic consumption in the world is provided through fishing, and due to the limitations of marine reserves, it is expected that the breeding capacities both on the coast and in the sea will be used more appropriately to meet the needs. Fish farming in cages is one of the best methods for aquatic production in the world.

In the year 1400, the total amount of fishing and aquaculture products of the country was equal to 1,258,460 tons. Of this figure, 558 thousand tons were related to the products of the country's aquaculture sector. Of the total aquaculture products of the country, 84.9 thousand tons (equivalent to 15%) belong to Khuzestan province.

Compared to aquaculture, fish farming in cages has not yet expanded and the amount of production from this method has reached only 9 thousand tons (less than 2%) per year. It is worth noting; Despite the high potential of Khuzestan province in aquaculture, this province has not had a share in production in cages.

In the demand section, the statistics show; The country's per capita consumption in 1395 was equal to 10.8 kg, this figure reached 13.8 kg in 1400. Although the trend of consumption of aquatic products in the country has been increasing slightly, its amount is much lower than the average consumption of the world and neighboring countries. It is worth noting; A major part of the low share was related to the increase in the price of protein-containing products in the country.

Despite the growing domestic demand for all types of warm blue and cold blue fish, as well as the existence of export potentials, the country has not yet reached an acceptable position in cage fish farming, whether in inland waters or in the sea. Based on this, if the products of the current design are offered, it will meet with sufficient demand and will not have any problems regarding sales.



World map showing estimated fish consumption per capita worldwide in 2019

6) Physical progress of the project

■ No ☐ Yes

This is a new project and has been defined to cover the whole country demands and export the product abroad. This project has no physical progress so far.

7) Operational plan and implementation scheduling

The implementation of the project stages until the operation of the first cages (which are related to Seabass fish) is planned for 12 months, and the operation of the project is expected from the beginning of 1405. The schedule of the project is presented in Table (7).

Table (7): Project Scheduling

year	1401	1402				1403				1404				1405				1406				1407			
Operations/Season	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Pre investment studies																									
Investor acceptance and start																									
Coordination and legal approval and efforts to finance																									
Additional studies and provision of engineering services																									
Land delivery of the operational area																									
Choosing the project manager (contractors)																									
Equipping site																									
facilities																									
Ordering, making and transporting cage materials and equipment																									
Installation of cages																									
Employing and training employees																									
Release of sea bass fry																									
Releasing Shank and Sabiti fry																									
Operation of seabass fish cages																									
Operation of Sabiti fish cages																									
Operation of shank fish cages																									

8) Financial Plan

8-1- Cost Estimation

Generally, there are two ways to fundraise for this project, fixed capital and initial working capital. The required investment before utilization is provided through fixed capital. Initial working capital will be used during utilization. Fixed capital includes, purchasing land, construction and landscaping, machinery and equipment, facilities, office stuff and pre-production costs. These types of costs are incurred at the beginning and before utilization and are consumed during the life of the project according to their service life. Working capital includes the capital required during the utilization of the project. The working capital of a production unit is the set of facilities, inventories and work in progress, as well as the cash required for the utilization of fixed capital in order to maintain and continue operations.

Determining the basic amount for inventories, work in progress and claims depends on the supply, production and sales capacity and business environment. In this section, the evaluation and estimation of the required investment (based on the price of the base year 1402 SH) is proposed.

Table (8): Cost Estimations

No.	Subject	Amount (Million Rials)
1	Fixed investment	493,900
2	Working capital	782,159
3	Annual production cost	2,825,317
4	Annual depreciation of investment	51,627
5	Estimate the total capital required	1,276,059
6	The total price for the product unit (by product type)	-
7	Sea bass fish (Riyal/kg)	1,310,460
8	SOBETI fish (Riyal/kg)	1,405,607
9	SHANAK fish (Riyal/kg)	1,543,998

Table (9): Fixed Capital Estimations (Capital Costs)

No.	Subject		Cost (Million Rials)
1	Purchasing land		0
2	Landscaping and land improvement		0
3	Civil operations and construction of buildings		7,480
4	Production machinery and equipment		410,000
5	Service equipment		29,000
6	Protection and environmental equipment		0
7	Overhead costs		0
8	Pre-Production Expenditure (As described in Table (11))	Pre-investment studies	700
		Project management and organization	23,368
		Technology education	932
9	Unexpected costs		22,420
Total			493,900

The main items included in working capital are:

- Raw materials (local and foreign): To prevent any interruptions in production process, production capacity, source and method of supplying materials, length of time during ordering and receiving materials, time of delivery and transportation, the amount of required raw materials, auxiliary materials and packaging are determined as one of the working capital items for one period. In this project, the coverage period of material inventory equivalent to one breeding period of Seabass and SOBEITY (150 days) in the first year is considered.
- Finished product and work in progress: Considering the steps and methods of production, the required time for production and storage has been determined and the related costs are considered as working capital. In this plan, the coverage period of the final product and work in progress is not included.
- Claims of expected funds from sold products that are collected in a short period of time. The duration for expected funds must be determined. According to the economic condition of Iran, cash is preferred.
- Revolving fund to finance the company's current expenses is considered as cash balance or revolving fund for a period of time in working capital based on production costs (without considering the cost of raw material production and depreciation). 180 days is considered in this plan.

Table (10): Total Net Working Capital Requirements (Production Costs)

No.	Subject	Amount (Million Rials)
1	Raw Materials Inventory	753,456
2	Work In Progress	0
3	Finished Product	0
4	Accounts Receivable	0
5	Cash and cash balance	28,709
6	(Commercial Accounts Payable)	0

Total Net Working Capital Requirements	782,165

Table (11): Pre-Production Expenditure

No.	Subject		Description	Total (million Rials)
1	Incorporation		-	100
2	Obtaining Licenses / Production License		-	120
3	Studying, Consulting, Research and Development, Traveling, Visiting and Participating in Local Exhibitions, etc.		1.5 thousandth of the investment costs of the project	700
4	Property Insurance		2 thousandth of depreciable fixed assets	940
5	Survey Fee, Financing, Contract and So On		Survey fee 0.5 thousandth, other 2.5 thousandth	1,130
6	Cartography, Supervising		2 thousandth of contract expenses	830
7	Other's	Staff Training	Equivalent to 1 days of Staff salary	102
		Wages And Salaries During the Construction	Equivalent to the salary of 10 personnel in 12 months	20,513
		Other Expenses	٪2.3	566
Total			-	**25,000**

8-2- Sales Revenue

According to the surveys, the price (wholesale) of each kilogram Sea bass (in ideal weight) is equal to 4.5 dollars and the price (retail) of each kilogram of SOBEITI (in ideal weight) is equal to 5.5 dollars and each kilogram of SHANAK fish (in Ideal weight) is equal to 3.5 dollars. According to the margin of prices in the form of wholesale, the income from the sale of the plan has been obtained. Based on this (and according to the production plan), the total sales amount of the plan in 1404 at the fixed prices of 1402 is predict to be 4180 billion Rials. This figure will increase in the following years due to the increase in production capacity and will increase to a maximum of 9,288 billion Rials.

Table (12): Project Revenue in The First 5 Years of Production Phase (Billion Rials)

No.	Subject	Q_1	Q_2	Q_3	Q_4	Total 1st Year	Total 2nd Year	Total 3rd Year	Total4 Th Year	Total 5th Year
1	SEA BASS	360	360	360	360	1,440	1,440	1,440	1,440	1,440
2	SOBEITI	0	0	0	0	0	2,400	0	2,400	0
3	SHANAK	0	0	0	0	0	0	1,200	0	1,200
Total		360	360	360	360	1,440	3,840	2,640	3,840	2,640

8-3- Length of Production Phase

The construction period of the plan is 12 months and it is considered to start from first 1403. The duration of the project is considered to be 7 years.

Table (13): Planning Horizon

Title	Month	-	year
Project identification	1	/	1402
Beginning of construction phase	1	/	1403
Beginning of production phase	1	/	1404
End of production phase	12	/	1410

Length of construction phase (months)	Start of phase (months)	Length of production phase (years)
12	12	7

8-4- Break-Even Analysis

From an economic point of view, break-even point analysis is an important technique that is used to study the relationship between costs, income and profit. The break-even point is the point at which total cost and total revenue are equal. In other words, it is used to analyze the effect of product volume change on the profit. The break-even point is calculated for 100% of practical capacity (year 1406SH onwards) below.

$$\text{Break-even sales value (Rials)} = \frac{\text{Total fixed costs}}{1 - \frac{\text{Total variable costs}}{\text{Sales value}}}$$

$$\text{The number of sales at the break-even point} = \frac{F_C}{S - V_C}$$

FC = Total Costs VC= Average Variable Costs Q = Quantity of Sales S = Unit Price

$$\text{Break-even sales value} = \frac{85{,}000}{1 - \frac{2{,}730{,}837}{3{,}840{,}000}} = 294{,}276 \text{ (Million Rials)}$$

$$\text{The number of sales at the break-even point} = \frac{85{,}000{,}043{,}600}{2{,}742{,}857{,}143 - 1{,}950{,}597{,}902} \approx 107 \text{(Ton)}$$

$$\text{Break-even ratio (\%)} = \frac{294{,}276}{3{,}840{,}000} = 7.7\%$$

Table (14) : Project break-even point estimation (Million Rials)

Title	Production 1404	Production 1405	Production 1406	Production 1407	Production 1408	Production 1409	Production 1410
Sales revenue	1,440,000	3,840,000	2,640,000	3,840,000	2,640,000	3,840,000	2,640,000
Variable costs	1,840,327	2,730,254	2,730,198	2,738,543	2,734,343	2,738,543	2,734,343
Profit margin	-400,327	1,109,746	-90,198	1,101,457	-94,343	1,101,457	-94,343
Profit margin ratio (%)	-28	29	-3	29	-4	29	-4
Fixed costs	79,458	85,583	85,676	87,970	83,709	85,147	83,347
Break-even sales value	-285,814	296,139	-2,507,658	306,690	-2,342,438	296,849	-2,332,322
Break-even ratio (%)	-19.8	7.7	-95.0	8.0	-88.7	7.7	-88.3

- According to COMFAR Results

Based on the calculations of COMFAR software, the break-even point in Rials including operating and non-operating costs, is 296thousand billion Rials and it will be achieved in the 7.7٪ of the practical capacity.

In the mentioned formula, the break-even point is determined by the relationship between fixed costs and the difference between unit sales price and unit variable costs. According to the break-even point relationship, three practical results are obtained from its analysis:

- The higher the fixed costs, the higher the break-even point.
- The greater the difference between unit sales price and variable operating costs, the lower the break-even point. In this case, fixed costs are absorbed faster through the difference between unit sales price and unit variable costs.
- A high break-even point is disproportionate. Since it makes the company vulnerable to changes in production (sales) levels.

8-5- Cost-Benefit Analysis

In project analysis, one of the most common methods is the **Benefit-Cost Ratio**. In this method, the ratio of the current value of possible benefits to the current value of costs is obtained. If this ratio is greater than one, the plan has economic justification for implementation. In terms of this index, the plan has favorable conditions.

Net Present Value is one of the other evaluation methods which is calculated according to the following relationship:

NPV= The Present Value of The Total Cost of The Period of Construction Phase and Production Phase - The Present Value of The Total Income of Construction Phase and Production Phase

NPV= The Present Value of The Fixed Assets Depreciation + Initial Investment - The Present Value of The Future Cash Flows

The **net current value** of the project at a discount rate of 20% is over 213.3billion Rials, which shows that the project is economically feasible.

One of the other methods of evaluating investment plans **internal rate of return**. In fact, the internal rate of return is the interest rate or the discount rate in which the current value of all the plan benefits is equal to the current value of its expenses.

According to the calculations, the internal rate of return of the project is estimated at 25.1% and compared to the Minimum Attractive Rate of Return, it is favorable.

Table (15): Project Return Index

Index	Amount	Unit of measurement
The Present Value of The Total Cost of The Period of Construction Phase and Production Phase	11,905,680	Million Rials
The Present Value of The Total Income of Construction Phase and Production Phase	12,118,974	Million Rials
NET PRESENT VALUE (NPV)	213,293	Million Rials
Cost-benefit RATIO (B/C)	1.02	-
INTERNAL RATE OF RETURN (IRR)	٪25.1	Percent
NPV RATIO (PI)	0.19	Rial per Rial of investment
NORMAL PAYBACK	3.71	Year

Profitability Index (PI) indicates how much economic profit will be obtained for each unit of money invested during the lifetime of the project.

Project Investment Payback Period is the period of time to get the initial capital of the project from its income. In other words, the capital return period shows the time it takes to recover the initial investment. This measure shows the speed of money return and the project's protection against risk. The return period (simple) of the plan is estimated to be equal to 3.71years (equal to the year 1407) according to the calculations.

8-6- Sensitive Analysis

In the sensitivity analysis of the plans, the percentage of changes in the internal rate of return (IRR) is measured in relation to the change in some basic parameters and variables. In this plan, the analysis has been carried out by major variables such as sales, fixed and operating costs. Table (16) shows the results of the sensitivity analysis regarding the variables of sales income, fixed assets and operating costs.

8-6-1- Sales Revenue

Changes in sales revenue are mainly caused by alteration in two variables: planned sales amount and product sales price. The results of the sensitivity analysis regarding sales income show; 4% increase in sales revenue of the plan, the internal rate of return will increase from 25.1% to 35%. On the contrary, in the case of a 4% decrease in sales revenue, the internal rate of return of the project will decrease to 15%.

Table (16): Sensitivity Analysis (Percentage of IRR changes caused by sales revenue, fixed assets and operating costs alteration)

Variation (%)	Sales revenue	Investment costs	Operating costs
-20%	-33%	28%	69%
-4%	15%	26%	34%
0%	25.1%	25.1%	25.1%
4%	35%	25%	16%
20%	73%	23%	-24%

8-6-2- Fixed Assets

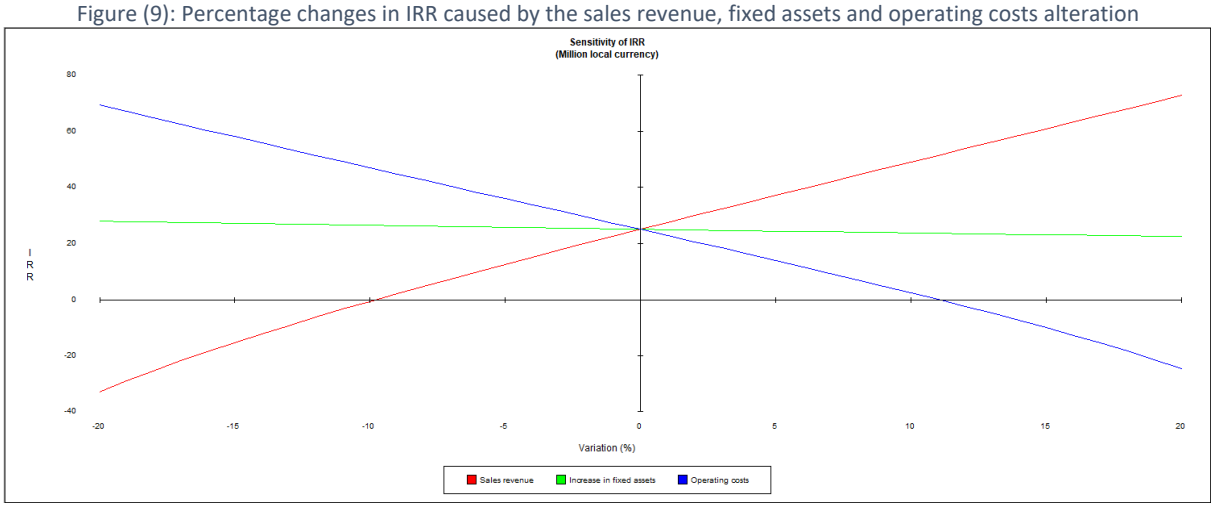
The change in the fixed assets is due to the fixed costs of the initial investment alterations. The results of the sensitivity analysis according to the fixed costs of the plan have been done and it shows that in case of an unexpected 20% increase in the fixed capital costs of the project, the internal rate of return will decrease from 25.1% to 23%. Conversely, if there is a 20% reduction in the fixed capital costs, the internal rate of return will increase and reach 28%.

8-6-3- Operating Costs

The operating costs of the plan is one of the crucial items in terms of sensitivity analysis regarding its changes. Therefore, unexpected and possible changes should be investigated.

The change in project operating costs is mainly caused by changes in raw material, supply, human resource and finally changes in other overhead costs of projects. If these parameters change, it can be as a result of the change in the technical coefficients of product production or the change in their purchase price. The sensitivity analysis indicates that in case of a 4% increase in the operating costs, the efficiency rate of the plan will decrease to 16%. On the contrary, if the total operating costs of the project are reduced by 4%, the internal rate of return will increase to 34%. Finally, the results of the sensitivity analysis show that the current project has a very high sensitivity to changes in sales revenue (changes in sales amount or sales price) and more considerations should be taken in this regard.

Figure (9): Percentage changes in IRR caused by the sales revenue, fixed assets and operating costs alteration



As you can see, the slope of the IRR change curve is higher relative to the changes in sales revenue compared to other items while the slope of the IRR change curve is lower relative to the changes in fixed assets, which indicates the greater sensitivity of the plan's internal rate of return to sales revenue and its lower sensitivity relative to operating costs and fixed assets.

8-7- Conclusion

The implementation of the project is planned with the purchase of 50 fish breeding cages. The total investment in land and building is estimated at 7 billion Rials and the total investment in main and auxiliary equipment is estimated at 461billion Rials. The total pre-operational costs are estimated at 25 billion Rials, including the total required fixed capital of 494 billion Rials and the total working capital required for the project is 782billion Rials. The total investment of the project is expected to come from the resources of the company's shareholders.

The sale of the plan in 1404 is predicted at fixed prices equal to 1,440 billion Rials. This figure will increase in the following years due to the increase in production capacity and will increase to a maximum of 3,840 billion Rials. The net profit of the plan has been positive in all years. The profit figure in 1405 is equal to 1,024 billion. The benefit of the plan is different in different years. The average annual profit of the plan is 291 billion Rials and the average profit margin is expected to be 9.8%. The internal rate of return (IRR) of the plan is also estimated at 25.1 percent and the investment return period (PBP) is estimated at a maximum of 3.71 years. Also, the net present value of the project's cash flows (NPV) is positive and, considering the expected interest rate of 30%, is equal to 213 billion Rials.

The liquidity status of the plan and the payment of dividends to the shareholders from the company's funds are also suitable. Therefore, if the assumptions and predictions are fulfilled, the plan under consideration has favorable profitability and according to the financial results obtained, its implementation is recommended. The economic discussions of the plan are summarized as follows.

Table (17): Summary of Economic Features

Nominal Capacity and Unit of Measurement	Product Name	Title Of the Project with ISIC Code	Title Of the Project
Nominal capacity: 2000 tons Practical capacity: 2000 tons	Types of fish – Sea bass-SOBEITY-SHANAK	Types of fish - Sea bass-SOBEITY-SHANAK (500312301)	Fish breeding project in cages in of Mahshahr Bays
Required Human Resource (Person)	Equity Shares (Million Rials)	Total Fixed Capital (Million Rials)	Project Duration
33	782,159	493,900	12
B/C	Applicant Available Cash (Million Rials)	Net Present Value (NPV) (Million Rials)	IRR (%)
1.0	1,276,059	213,293	٪25.1
ROI (%)	NPV Ratio / Profitability Index (Rial per Rial invested)	Dynamic Payback Period (Year)	Normal Payback Period (Year)
23	0.19	7.18	3.71
Average Assets Turnover Ratio	Average Net Profit Margin (%)	Average Annual Profit (%)	Maximum Annual Sales (Million Rials)
1.50	٪9.8	291,794	3,840,000

8-8- Estimation of currency rate fluctuation during the project implementation

The currency rate at the time of evaluation is included as described in Table (18). The purchase and sale prices are determined with the energy exchange transactions and are adjusted to a large extent under the influence of the currency rate increase.

Therefore, currency rate fluctuations regarding the purchase of foreign equipment will be compensated to some extent by the income from sales which will have a little effect on the evaluation results. So, in the construction and implementation phase, if the financing of the project provided through foreign currency sources, the amount of required investment will not change much.

Table (18): Currencies exchange Rate

Unit of Measurement	Unit Price	Currency
Rials	413,204	USD
Rials	451,531	EURO

Exchange rate of Central Bank, Exchange Trading System (ETS) dated 05/25/1402

9) Investment Required, method of fundraising and guarantees

9-1- Foreign Currency Required

The plan does not need currency and the total fixed capital of the plan is Rial.

Table (19): Foreign (Fixed) Currency Required

No.	Year	Required Investment
1	Year 1(403 SH)	0
2	Year 2	0
3	Year 3	0
4	Year 4	0
5	Year 5	0

9-2- Model Of Partnership and Fundraising

Participation in the present project and its fundraising process is predicted to be in the form of establishing a company inside Iran. The total required investment is predicted through the investor's contribution. Financing through local banks has not been included in the fundraising process.

9-3- Payback Period

The payback period is the period of time when the initial investment of the plan is compensated from the annual cash funds. The payback period (simple) of the plan is estimated to be 3.71years (equal to 1407) according to the calculations of CAMFAR.

Dynamic Payback Period of the plan is also estimated at 7.18years.

10) Incentives, features and benefits of the plan

Some of the financial supports for production companies are loans and bank facilities and tax exemptions which can facilitate the project implementation and provide the favorable condition for investment. In the following, some of these supports will be discussed.

One of the important bank facilities for production units is the long-time repayment period loans up to 70% of fixed capital by the Iran's state banks. This amount can be increased up to 90% for deprived areas if foreign machinery is used. The interest rate of long-term facilities in the industry sector is 23%, which in case of financial prudence, only a part of the interest can be repaid. The repayment period of long-term bank facilities is up to 8 years according to the production plan, the type of technology and the possibility of product exportation.

Another important bank facility is short-term bank loans (6 to 12 months) to use as working capital needed to carry out production processes, which will be provided up to 70% by bank communities. Obtaining short-term facilities to this extent depends on gaining the trust of the operating banks and having an acceptable financial history.

In the tax department: according to Article 81 of the country's tax law, the income from all activities of agriculture, animal husbandry, fish and bee breeding and poultry breeding, fishing and fishing, animal husbandry, restoration of pastures and forests, gardens and trees of all kinds and plants of all kinds. They are exempt from paying taxes.

(Attachment Number 2)

Summery Sheet

Project introduction
1. Project Title: Fish breeding plan in cages in Mahshahr Bays
2. Sector: agriculture sub-sector: fish farming
3. Products/services: Types of fish – Seabass-SOBEITY-SHANAK
4. Location: Khuzestan-Mahshahr city-Mahshahr Bays
5. Project description: The implementation of the project is planned with the purchase of 50 fish breeding cages. The total investment in land and building is estimated at 7 billion Rials and the total investment in main and auxiliary equipment is estimated at 461 billion Rials. The total pre-operational costs are estimated at 25 billion Rials, including the total fixed capital required of 494 billion Rials and the total working capital required for the project is 782 billion Rials. The total investment of the project is expected to come from the resources of the company's shareholders. The sale of the plan in 1404 is predicted at fixed prices equal to 1,440 billion Rials. This figure will increase in the following years due to the increase in production capacity and will increase to a maximum of 3,840 billion Rials. The net profit of the plan has been positive in all years. The profit figure in 1405 is equal to 1,024 billion. The benefit of the plan is different in different years. The average annual profit of the plan is 291 billion Rials and the average profit margin is expected to be 9.8%. The internal rate of return (IRR) of the plan is also estimated at 25.1 percent and the investment return period (PBP) is estimated at a maximum of 3.71 years. Also, the net present value of the project's cash flows (NPV) is positive and, considering the expected interest rate of 30%, is equal to 213 billion Rials. The liquidity status of the plan and the payment of dividends to the shareholders from the company's funds are also appropriate.
6. Annual Capacity: 2,500ton

Project Status
7. Local/internal raw material access: 100%
8. Sales: 3,840billion Rials **Anticipated local market:** 40% **Anticipated export market:** 60%
9. construction period: 12 months
10. project status: - Feasibility study available? Yes. The feasibility of the project has been evaluated from different aspects and the results of the feasibility study are favorable in terms of market, engineering, financial and economic indicators. - Required land provided? Yes. The approval and permission for the construction and operation of the cage in Mahshahr Bays has been given. Based on this, the operator can use this water area according to the relevant regulations. - Legal permission (establishment license, foreign currency quota, environment) taken? Yes - Partnership agreement concluded with local/foreign investor? No. So far, no partnership agreement has been prepared for the implementation of the project. This plan has the necessary features to attract shareholders' financial resources. - Agreement with local/foreign contractor(s) concluded? No. so far, no agreement has been made for the construction and production of cages with domestic or foreign contractors. - The infrastructure utilities (electricity, water supply, telecommunication, fuel, road, etc.) procured? Yes - List of technical know-how, machinery, equipment, as well as companies that sell or manufacture the product? Yes. The desired equipment, according to the studies, includes cage flotation equipment, cage restraint equipment on the bottom of the lake, required nets, fiberglass pools, floats, boats and fish sorters and other intelligent management systems in operation (including feeding system, subsurface monitoring system, waste collection system, environmental data system, etc.). - Financing agreement for machinery, equipment and know-how concluded? No

Financial structure

11. Financial table:

Description	Local Currency Required			Foreign Currency Required	Total Euro
	Million Rial	Exchange Rate	Euro		
Total Fixed Investment Costs	493,900	451,531	1,093,834	0	1,093,834
Total Net Working Capital Requirements	782,159	451,531	1,732,237	0	1,732,237
Total Investment	1,276,059	-	2,826,071	0	2,826,071

- Value Of Foreign Equipment/Machinery: 0 Euro
- Value Of Local Equipment/Machinery: 96,398 Euro
- Value Of Foreign Technical Know-How: 0 Euro
- Value Of Local Technical Know-How: 3,613 Euro
- Net Present Value (NPV): 472,378 Euro — Net present values discounted to: 1403
- Internal Rate of Return (IRR): 25.1% ٪
- Normal Payback: 3.71 year
- Minimum Attractive Rate of Return: 20% ٪

General information

12.Project Type: new Project ☑ Explanation / Rehabilitation project ☐

Name / Company name:-

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Email: meisam.bavarsad@gmail.com Website:

Local entrepreneur: Private Sector ☑ government /public sector ☐