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 Maron dam lake

(Attachment Number ١)

Date: ٢٠٢٣/٠٤/٢١

v-٢

In the name of God

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Tables and Figures

۱) Location of the project

۱-۱- Province

Khuzestan province is located in the southwest of Iran (in ٤٧° ٤٢′ to ٥٠° ٣٩′ east of the Greenwich meridian and ٢٩° ٥٨′ to ٣٢° ٥٨′ north of the equator). The area of Khuzestan province is ٦٣,٢٣٨square kilometers. With a population of ٤,٩٩٤thousand people in ١٤٠٠SH, 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 ٨٨٠km 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 (٣٣٠km long) from the south and Iraq (٣٣٠km 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 (۱): The Province location in Iran


Figure (۲): Location map of Maron Dam in Khuzestan

Figure (۳): Political divisions of Khuzestan

۱-۲- County

BEHBAHAN county is located in the southeast of Khuzestan province. Its center is the city of BEHBAHAN. BEHBAHAN is famous for its underground gas layers and oil-rich areas, vast agricultural lands and high-quality dairy products. BEHBAHAN city is bordered KOHGILUYEH and BOYER-AHMAD Province from the north and northeast and BUSHEHR province from the south. According to the census of ۲۰۱۵, the population of BEHBAHAN city was ۱۸۰ thousand people.

BEHBAHAN is located in the plain and adjacent to the Zagros Mountain range and has the abundant water of Maron, KHAIRABAD and Zahra rivers, it has a special ecological position and special areas.

This city has provided favorable facilities for the expansion of the agricultural sector due to the special and suitable weather conditions and the existence of the Maroon and KHAIRABAD rivers, as well as having arable and fertile soil. The most important of them are: wheat, barley, rice, cotton, sugar beet, sesame, linseed, all kinds of summer vegetables and dates.

The industries of BEHBAHAN city are divided into two categories: machine and manual industries. Machine industries also include light industries (food industries, wood, and means of transportation) and heavy industries (oil-related industries and all kinds of mines and construction stones).

BAID BOLAND Gas Refinery (phases ۱ and ۲), PAZNAN ۲ and Reg SEFID ۲ oil units in ZIDON sector, cement factory, melamine machine brick, aluminum containers, cabinet making, sugar making, date packing, etc. are among the most important factories in this region.

of the most important factories in this region; BIDBLAND gas refinery (phases ۱ and ۲), PAZNAN ۲ and Reg SEFID ۲ in ZIDON sector, cement factory, brick making machine, melamine making, aluminum containers, cabinet making, sugar making, date packing etc. can be mentioned.

The underground resources and mines of this city include oil, gas, limestone, gypsum, clay, sand and raw materials for cement production.

BEHBAHAN combined cycle power plant is also one of the sources of energy supply in this city.

The presence of fertile lands for agriculture, the full potential of the region for animal husbandry, the abundance of mines and underground resources, and the prosperity of industries, including handicrafts and light and heavy machinery, have led to the great prosperity of the region.

Some people of this city are merchants.

Due to its special geographical and natural location, BEHBAHAN has many dams, all of which are built in the north of the city and are one of the tourist and natural attractions of this city. Such as: ARIOBARZAN Regulatory Dam, Shahada Diversion Dam, Maroon Grand Dam.

۲) Project Status

Maron Dam Lake is located on the Maron River, ۱۸ km east of BEHBAHAN city and ۱۹ km west of DEH DASHT city. Maroon is a river that originates from the Zagros Mountain range in KOHGILUYEH and BOYER Ahmad provinces and after traveling ۱۲۰ kilometers, it enters the Maron dam lake in Khuzestan province. After crossing the Maroon Dam, this river flows into the Persian Gulf through Khor Musa.

This dam is a type of earthen dam designed with a concrete core with a height of ۱۷۰ meters and a length of ۳٤٥ meters. The purpose of building this dam is to control the flood and flow of the maroon river, supply drinking water to BEHBAHAN city, develop and supply water to the agricultural lands of CHAHARDASHT with an area of ٥٥ thousand hectares, including BEHBAHAN, JAIZAN, Khalaf Abad, Shadgan and also produce hydroelectric power.

The capacity of Maron Dam Lake is about ۱۲۰۰ million cubic meters. The length of the lake is ۳۰ km and its area is ۲٥ km.

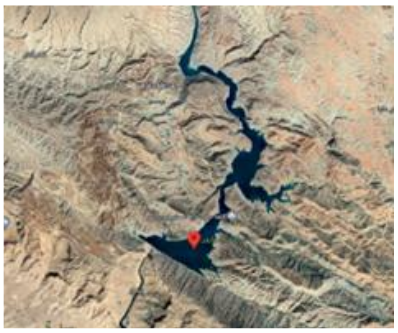


Figure (٤): Project location map

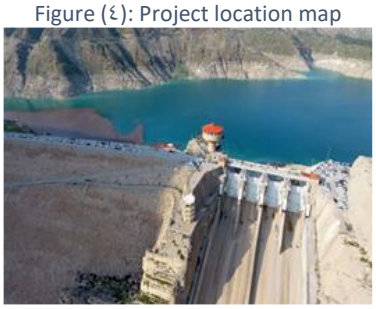


Figure (٥): The picture of the Maroon Dam

۲-۱-Access to infrastructures

Currently, there is only electricity infrastructure in the Maroon Dam Lake area. There is an access road known as "PLAGE" in parts of the Maroon Dam Lake in order to access the dam facilities. This lake is ۱۸ km away from BEHBAHAN city. The nearest port (DILAM) is located ۱۰۰ km away in Bushehr province. The nearest railway station is located at a distance of ۲٥ km and the nearest airport (OMIDIYEH) is located at a distance of ۱٦ km.

Table (۱): access to infrastructures

No.	Required Infrastructure	Distance From Project Status(km)	Location Of Infrastructure Provision
۱	Water	۰	Maroon Lake
۲	Electricity	۰.۳	Maroon Dam
۳	Gas	–	It is not predicted
٤	Telecommunication	–	It is not predicted
٥	Main road	۱۸	BEHBAHAN belt
٦	Side road	۰.۲	PLAGE Road - Maroon Dam communication road
۷	Airport	۱٦	OMIDIYEH Airport (AGHAJARI)
۸	Port	۱۰۰	DILAM Port - Bushehr
۹	Railway Station	۲٥	Khorramshahr Railway

Figure (٦): Access routes to the project

۳) Technical specifications of the project

۳-۱- Product

Carp: Carp is the name of a species of the carp family that is distributed in large parts and regions of Europe and Asia. This species is found in all kinds of fresh water sources including rivers, lakes, dams and wetlands.

A female carp typically releases ۳۰۰,۰۰۰ eggs into the water at a time.

Reproduction usually occurs in the spring when water temperature increases and rainfall increases, and this fish can spawn several times per breeding season. Spawning stimulants such as gonadotropin hormones are used in fish farms to increase spawning and reproduction. This fish is omnivorous and feeds on plants, small aquatic organisms, worms, crustaceans, baby insects, animal carcasses, fish eggs and even its own babies.

Although carp have high tolerance and adaptability in most waters, they prefer warm, calm and plant-covered waters with a soft substrate.

This fish can live in waters between ۳ and ۳۵ degrees Celsius, and the optimal temperature for them is between ۲۳ and ۳۰ degrees Celsius, and their spawning starts at a temperature of ۱۷ or ۱۸ degrees.

Carps easily tolerate water with very low oxygen and freezing of the water surface in winter.

Trout: There are many factors in fish breeding cages that make it a suitable method for breeding all kinds of fish, especially rainbow trout. Rainbow trout are considered one of the most popular farmed fish due to their high sales and the following reasons.

۱. Rapid growth of salmon in a fish breeding cage

۲. It is omnivorous and does not cause concern for the farmer in the fish breeding cage.

۳. The market has a good sale both inside and outside of Iran.

٤. The number of rainbow trout eggs is very large and they will grow easily in the fish breeding cage.

٥. They will grow well in the high-density maintenance system.

٦. They adapt well to manual feeding.

Sturgeon: Sturgeon fish is one of the most valuable types of fish in the world, and because of the rarity of sea sturgeon, these fish are cultivated in sea cages.

Caviar fish is one of the fish that has a high value both in terms of food and economy.

The water temperature for caviar fish breeding should be from ۱٥ to ۲۷ degrees Celsius, and of course the most suitable temperature for better growth of this fish is ۱۹ to ۲۱ degrees Celsius. If the water temperature reaches ٦ degrees Celsius, the growth of these fish stops and they do not feed.

The second factor that is effective in the growth and cultivation of caviar fish is water salinity. The best water salinity is between ٤ and ۱۰ grams per liter, and some breeders have bred these fish in water salinity of ۱۸ grams per liter. The third point about sturgeon breeding is the amount of dissolved oxygen in the water, which should be determined from ٦ to ۸ mg/liter. The carbon dioxide of the water should not be high in any way, and the best amount for it is ۱۰ mg or less, and the suitable pH for the growth of these fish is set from ٥,۸ to ۷.

۳-۲- Project Requirement

۳-۲-۱- Land And Required Infrastructure

To breed fish in a cage with a capacity of ۱۲۰۰ tons per year, ۳۰ cages of ۵۰ tons with a practical production capacity of ۲۰ to ۲۵ tons (with a diameter of ۲۰ meters and a depth of ۱۰ 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 (۲): Amount of investment in land, landscaping and building

No.	Requirements	Description	Investment Required		Total Cost (Million Rials)
			Required Area	Unit Price of Purchase/Construction	
۱	Land purchase ۲۹ * ۷۰	Work area - Khuzestan - BEHBAHAN city - Maron dam lake	۲,۰۰۰	۰	۰
۲	Landscaping operations	According to the calculations	۱,۲۰۰	۶,۳۳۳,۳۳۳	۷,۶۰۰
۳	Construction	concrete pool	۲۴۰	۷۰,۰۰۰,۰۰۰	۱۶,۸۰۰
		Guest house, office building and central management	۵۰	۱۲۰,۰۰۰,۰۰۰	۶,۰۰۰
		Labor and support building (restaurant, dressing room, prayer room, bathroom and toilet)	۳۰	۸۰,۰۰۰,۰۰۰	۲,۴۰۰
		Water, electricity and gas facilities building	۲۰	۷۰,۰۰۰,۰۰۰	۱,۴۰۰
		guard and janitor building	۴۰	۸۰,۰۰۰,۰۰۰	۳,۲۰۰
		Other buildings (utility and warehouse)	۳۶۰	۵۰,۰۰۰,۰۰۰	۱۸,۰۰۰
Total			-	-	۵۵,۴۰۰

۳-۲-۲- Plant Machinery and Equipment

Based on the weather conditions, water depth, water temperature and other conditions of the Maroon Dam Lake, fish farming equipment in cages for breeding warm and cold-water fish are needed as follows. All equipment can be produced in the country.

Table (۳): Plant Machinery and Equipment

No.	Equipment/Machinery	Required investment			Total cost (Million Rials)
		Amount	Purchase Price	Currency	
۱	The floating part of the cage (polyethylene pipes, brackets, floats, etc.)	۳۰	۶,۰۰۰	(Million Rials)	۱۸۰,۰۰۰
۲	Restraint system (anchor and chain, ...)				
۳	Types of nets (main, protective and anti-bird)				
۴	barge (floating)	۱	۷,۰۰۰	(Million Rials)	۷,۰۰۰
۵	Barge restraint system	۱	۳۰۰	(Million Rials)	۳۰۰
۶	Feeding system equipment on the barge	۱	۱,۰۰۰	(Million Rials)	۱,۰۰۰
۷	work boat (service)	۶	۱,۲۰۰	(Million Rials)	۷,۲۰۰
۸	net washing (machine)	۱	۵۰۰	(Million Rials)	۵۰۰
۹	sorter - fish counter (۶۰ thousand per hour)	۵	۳۰۰	(Million Rials)	۱,۵۰۰
۱۰	Waste collection system	۱	۱,۵۰۰	(Million Rials)	۱,۵۰۰
۱۱	Security system (camera), remote monitoring and control system and subsurface monitoring system	۱	۶,۰۰۰	(Million Rials)	۶,۰۰۰
۱۲	Environmental data receiving system	۱	۳,۰۰۰	(Million Rials)	۳,۰۰۰
۱۳	All types of pumps and screeds	۵	۸۰	(Million Rials)	۴۰۰
۱۴	Generator -۸۰KV	۱	۳,۰۰۰	(Million Rials)	۳,۰۰۰
۱۵	Plastic pallet	۲۰	۷	(Million Rials)	۱۴۰
۱۶	Other main equipment - Internal	۱	۸,۴۶۰	(Million Rials)	۸,۴۶۰
Total		-	-	-	۲۲۰,۰۰۰

Table (٤): 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)	
١	Distribution Of Electricity / Demand Price	Kw	Facility	٣٠	٦	١٨٠
٢	Several Electrical Cables	M	Facility	٣٠٠	٤	١,٢٠٠
٣	Electrical equipment of the lighting system	Amount	Facility	١٥	٤٠	٦٠٠
٤	The Cost of Panel Boards and Related Electrical Equipment	Amount	Facility	٣	٣٢٠	٩٦٠
٥	Water purifier	M	Facility	٣	١٠٠	٣٠٠
٦	Drinking water pump and pumping equipment	Amount	Facility	١	١٥٠	١٥٠
٧	١ inch water pipe	Amount	Facility	٣٠٠	٢	٦٠٠
٨	Water tank (١٠٠٠٠ liters)	M	Facility	١	٤٠٠	٤٠٠
٩	Human sewage transfer route	-	Facility	١٠٠	١,٥	١٥٠
١٠	Human sewage disposal well	M	Facility	١	٢٥٠	٢٥٠
١١	Firefighting, safety and health equipment and...	-	Facility	١٠	٣٠	٣٠٠
١٢	Water heater and heater	Machine	Facility	٣	٣٥٠	١,٠٥٠
١٣	Air conditioner	Machine	Facility	٣	٨٥٠	٢,٥٥٠
١٤	Evaporative cooler	Machine	Facility	٢	٢٥٠	٥٠٠
١٥	heater	Machine	Facility	٥	١٠٠	٥٠٠
١٦	Refrigerated Nissan van	Machine	Vehicle	١	٨,٠٠٠	٨,٠٠٠
١٧	Nissan Cargo	Machine	Vehicle	٢	٧,٠٠٠	١٤,٠٠٠
١٨	car	Machine	Vehicle	٢	٧,٠٠٠	١٤,٠٠٠
١٩	Other safety equipment and CCTV system of office building	Machine	Facility	١	٢,٠٠٠	٢,٠٠٠
٢٠	Office Equipment	Set	Equipment	١١	٥٠٠	٥,٥٠٠
٢١	Restaurant Equipment	Set	Equipment	٢٥	٣٠	٧٥٠
٢٢	Medical Equipment	Set	Equipment	١	٨٠٠	٨٠٠
٢٣	Other ancillary facilities	Set	Equipment	١	١,٢٦٠	١,٢٦٠
Total				-	-	٦١,٠٠٠

٣-٢-٣- Raw Materials

In the present plan, the main raw materials include fry and its feed. The selected fry was chosen according to the two cultivation periods and the short cultivation period of ١٠٠ grams. The ideal average weight is ٧٥٠ grams. The price of ١٠٠ grams of baby fish is about ١٦٥,٠٠٠ Rials. The amount of feed to reach the ideal weight has been calculated with a feed conversion ratio (FCR[١]) equal to ١,٢ for salmon and ١,١ for carp. The average price of each kilo of food is about ٤٥٠,٠٠٠ rials. It is worth noting; It is easily possible to supply these materials in the domestic market.

Table (٥): Costs of Raw Material for Production

No.	Title	Average price of unit (Rials)	Unit	Amount of consumption in nominal capacity	The cost of materials at the nominal capacity (Million Rials)
١	baby fish (١٠٠ gr)	١,٦٥٠,٠٠٠	Kg	١٦٨,٠٠٠	٢٧٧,٢٠٠
٢	Types of aquatic feed (starting, growth and fattening)	٤٥٠,٠٠٠	Kg	١,١٩٦,٠٠٠	٥٣٨,٢٠٠
٣	medicine	٦,٠٠٠,٠٠٠	Kg	٢٠٠	١,٢٠٠
٤	Transportation	١٠,٠٠٠,٠٠٠	item	٣٩٠	٣,٩٠٠
٥	Types of plastic baskets/pallets (consumable)	١,٥٠٠,٠٠٠	Amount	١٥٠	٢٢٥
Total		-	-	-	٨٢٠,٧٢٥

١. feed conversion ratio

۳-۲-٤- Management and human resource

With the start of the operation of the current plan, the employment of ۳۸ people will be possible. Normally, ۳ people are needed for each cage under normal conditions and ۳ people are needed seasonally. The specifications of the required manpower are described in Table (٦).

Table (٦): Management and Human Resource

No	Level of skill	Number of staff	Average basic salary - Rial
۱	Senior	۱۲	۱٦۰,۸۳۳,۳۳۳
۲	Mid-level	۲	۱۰۰,۰۰۰,۰۰۰
۳	Junior	۲٤	۸۷,۷۲۷,۲۷۳

Number Of Direct Mid-Level Staff Required	۲	Person
Number Of Direct Junior Staff Required	۲٤	Person
Number Of Direct Senior Staff Required	۱۲	Person
Total	۳۸	person

٤) Ownership and legal permissions

٤-۱- land ownership

The design and implementation of this project is considered in the area of the Maron Dam Lake and a part of the coastal area (with an area of at least ۲۰۰۰ square meters). The selected marine area is in the western part of the dam and in the area of access to the beach communication road. In order to build fish in cages and exploit them, documents under the title of establishment license and exploitation license (in accordance with the terms and conditions mentioned in paragraph ٤-۳-٤) 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..

٤-۲- Intellectual Property and Concessions

Farming fish in cages in the Maroon Dam Lake, according to the established standards and regulations, requires the necessary knowledge and experience in this regard. Farming of 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 ۸۲۹ 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.

٤-۳- Legal permissions

Currently, the Fisheries Organization has conducted the necessary studies regarding fish breeding in cages in the Maroon Dam Lake, 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 country.

In addition to the mentioned cases, the construction of a cage in the Maroon Dam Lake requires inquiries and approval from the following organizations:

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

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.

۵) market research and competition

۵-۱-Target market introduction

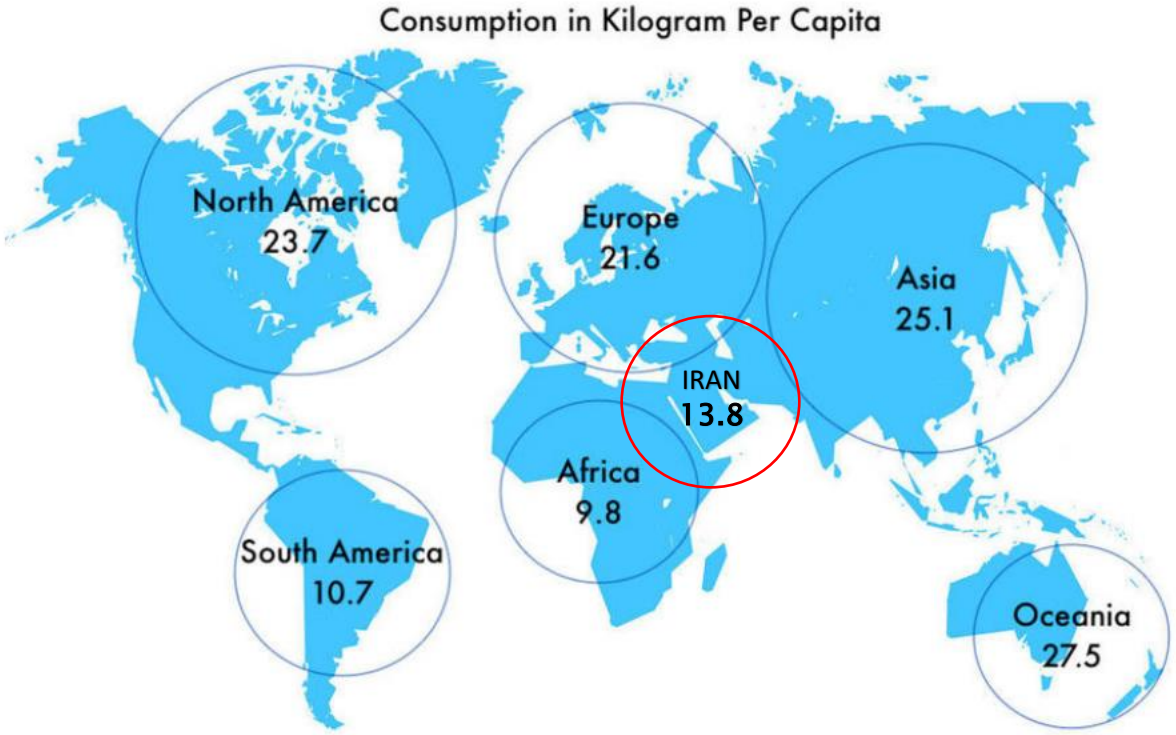
Currently, a large part of the aquatic consumption in the world is provided through fishing, and due to the limitations of marine reserves, it is expected that the breeding capacities both on the coast and in the sea will be used more appropriately to meet the needs. Fish farming in cages is one of the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

In the year ۱٤۰۰, the total amount of fishing and aquaculture products of the country was equal to ۱,۲۵۸,٤٦۰ tons. Of this figure, ۵۵۸ thousand tons were related to the products of the country's aquaculture sector. Of the total aquaculture products of the country, ۸٤,۹ thousand tons (equivalent to ۱۵٪) 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 ۹ thousand tons (less than ۲٪) 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 ۱۳۹۵ was equal to ۱۰,۸ kg, this figure reached ۱۳,۸ kg in ۱٤۰۰. 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

٦) Physical progress of the project

■ No ☐ Yes

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

٧) Operational plan and implementation scheduling

The implementation of the project stages until its operation is planned for ١٢ months, and the operation of the project is expected from the beginning of ١٤٠٤. The schedule of the project is presented in Table (٧).

Table (٧): Project Scheduling

year	1402				1403				1404			
Operations/Season	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												
Construction and landscaping												
Order, purchase and transportation of machinery												
Installation of cages												
Facilities and utility												
Employing and training employees												
Unforeseen delays												
Start of operation												

۸) Financial Plan

۸-۱- 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 operation and are consumed during the life of the project according to their service life. Working capital includes the capital required during the operation of the project. The working capital of a production unit is the set of facilities, inventories and work in progress, as well as the liquidity required for the exploitation of fixed capital in order to maintain the operation.

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 ۱٤۰۲ SH) is proposed.

Table (۸): Cost Estimations

No.	Subject	Amount (Million Rials)
۱	Fixed investment	۳۸۷,۲۰۰
۲	Working capital	۲٦۱,۷٦٤
۳	Annual production cost	۹۹۹,۷٦۰
٤	Annual depreciation of investment	٤۳,۱٤٥
٥	Estimate the total capital required	٦٤۸,۹٦٤
٦	The total price for the product unit (by product type)	–
۷	Salmon (riyal/kg)	۸٥۰,٤٦٦
۸	Carp fish (riyals/kg)	۸۰۳,۲۲٥

Table (۹): Fixed Capital Estimations (Capital Costs)

No.	Subject		Cost (Million Rials)
۱	Purchasing land		۰
۲	Landscaping and land improvement		۷,٦۰۰
۳	Civil operations and construction of buildings		٤۷,۸۰۰
٤	Production machinery and equipment		۲۲۰,۰۰۰
٥	Service equipment		٦۰,۰۰۰
٦	Protection and environmental equipment		۰
۷	Overhead costs		۰
۸	Pre-Production Expenditure (As described in Table (۱۱)	Pre-investment studies	٥۳۰
		Project management and organization	۳۳,۳٤٤
		Technology education	۱,۱۲٦
۹	Unexpected costs		۱٦,۸۰۰
Total			۳۸۷,۲۰۰

The primary 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 crop (۱۸۰ days) 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). ۱۸۰ days is considered in this plan.

Table (۱۰): Total Net Working Capital Requirements (Production Costs)

No.	Subject	Amount (Million Rials)
۱	Raw Materials Inventory	۲۱۰,٦۳۱
۲	Work In Progress	۰
۳	Finished Product	۰
٤	Accounts Receivable	۰
٥	Cash-In-Hand	٥۱,۱۳٥
٦	(Commercial Accounts Payable)	۰
Total Net Working Capital Requirements		۲٦۱,۷٦۷

Table (۱۱): Pre-Production Expenditure

No.	Subject		Description	Total (million Rials)
۱	Incorporation		-	۱۰۰
۲	Obtaining Licenses / Production License		-	۱۲۰
۳	Studying, Consulting, Research and Development, Traveling, Visiting and Participating in Local Exhibitions, etc.		۱.۵ thousandth of the investment costs of the project	۵۳۰
٤	Property Insurance		۲ thousandth of depreciable fixed assets	۷۰۰
۵	Survey Fee, Financing, Contract and So On		Survey fee ۰,۵ thousandth, other ۲,۵ thousandth	۸۵۰
٦	Cartography, Supervising		۲ thousandth of contract expenses	۵۵۰
۷	Other's	Staff Training	Equivalent to ۳۰ days of Staff salary	۵۷٦
		Wages And Salaries During the Construction	Equivalent to the salary of ۱۲ personnel in ۱۲ months	۳۰,۳۹۸
		Other Expenses	٪۳.۵	۱,۱۷٦
Total			-	۳۵,۰۰۰

۸-۲- Sales Revenue

According to the surveys, the price (wholesale) of each salmon (ideal weight) is equal to ۱,۰۵۰,۰۰۰ Rials and the price (retail) of each weight of carp (ideal weight) is equal to ۱,۰٦۰,۰۰۰ Rials. According to the margin of prices, the main 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 ۱٤۰٤ at the fixed prices of ۱٤۰۲ is estimated to be ٦۳۳ billion Rials. This figure will increase in the following years due to the increase in production capacity and will increase to a maximum of ۱,۲۷ billion Rials.

Table (۱۲): Project Revenue in The First ۵ Years of Production Phase (Billion Rials)

No.	Subject	Q_1	Q_2	Q_3	Q_4	Total ۱st Year	Total ۲nd Year	Total ۳rd Year	Total ٤ Th Year	Total ۵th Year
۱	salmon	۷۹	۷۹	۷۹	۷۹	۳۱۵	٤٤۱	۵۳٦	٦۳۰	٦۳۰
۲	Carp	۸۰	۸۰	۸۰	۸۰	۳۱۸	٤٤۵	۵٤۱	٦۳٦	٦۳٦
Total		۱۵۸	۱۵۸	۱۵۸	۱۵۸	٦۳۳	۸۸٦	۱,۰۷٦	۱,۲٦٦	۱,۲٦٦

۸-۳- Length of Production Phase

The construction period of the plan is ۱۲ months and it is considered to start from first ۱٤۰۳. The duration of the project is considered to be ۷ years.

Table (۱۳): Planning Horizon

Title	Month	-	year
Project identification	۱	/	۱٤۰۲
Beginning of construction phase	۱	/	۱٤۰۳
Beginning of production phase	۱	/	۱٤۰٤
End of production phase	۱۲	/	۱٤۱۰

Length of construction phase (months)	Start of phase (months)	Length of production phase (years)
۱۲	۱۲	۷

۸-٤- 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 ۱۰۰٪ of practical capacity (year ۱٤۰۸SH onwards) below.

$$\text{Break-even sales value (Rials)} = \frac{\text{Total fixed costs}}{۱ - \frac{\text{Total variable costs}}{\text{Sales value}}}$$

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

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

$$\text{Break-even sales value} = \frac{۹٦,۲٤۵}{۱ - \frac{۹۰۲,۰۵٦}{۱,۲٦٦,۰۰۰}} = ۳۳٤,۷۹۵ \text{ (Million Rials)}$$

$$\text{The number of sales at the break-even point} = \frac{۹٦,۲٤۵,۳۰۲,۵۰۰}{۱,۵۰۷,۱٤۲,۸۵۷ - ۱,۰۷۵,۲۲۱,۱۵۸} \approx ۲۰٦ \text{ (Ton)}$$

$$\text{Break-even ratio (\%)} = \frac{۳۳٤,۷۹٥}{۱,۲٦٦,۰۰۰} = ۲٦.٤٪$$

Table (۱٤) : Project break-even point estimation (Million Rials)

Title	Production ۱٤۰٤	Production ۱٤۰٥	Production ۱٤۰٦	Production ۱٤۰۷	Production ۱٤۰۸	Production ۱٤۰۹	Production ۱٤۱۰
Sales revenue	٦۳۳,۰۰۰	۸۸٦,۲۰۰	۱,۰۷٦,۱۰۰	۱,۲٦٦,۰۰۰	۱,۲٦٦,۰۰۰	۱,۲٦٦,۰۰۰	۱,۲٦٦,۰۰۰
Variable costs	٤٦۸,۷۹۹	٦٤۲,۱۰۲	۷۷۲,۰۷۸	۹۰۲,۰٥٦	۹۰۲,۰٥٦	۹۰۲,۰٥٦	۹۰۲,۰٥٦
Variable margin	۱٦٤,۲۰۱	۲٤٤,۰۹۸	۳۰٤,۰۲۲	۳٦۳,۹٤٤	۳٦۳,۹٤٤	۳٦۳,۹٤٤	۳٦۳,۹٤٤
Variable margin ratio (%)	۲٦	۲۸	۲۸	۲۹	۲۹	۲۹	۲۹
Fixed costs	۸۸,۰۲٥	۹۲,۷٥۳	۹٦,۲۹۹	۹٦,۲٤٥	۹۰,۱٥۸	۸۹,٤۷۱	۸۹,٤۷۱
Break-even sales value	۳۳۹,۳۳۹	۳۳٦,۷٤۰	۳٤۰,۸٥٦	۳۳٤,۷۹٥	۳۱۳,٦۲۱	۳۱۱,۲۳۱	۳۱۱,۲۳۱
Break-even ratio (%)	٥۳.٦	۳۸.۰	۳۱.۷	۲٦.٤	۲٤.۸	۲٤.٦	۲٤.٦

- According to COMFAR Results

Based on the calculations of COMFAR software, the break-even point including operating and non-operating costs, is ۳۳٤,۷۹ billion Rials and it will be achieved in the ۲٦.٤٪ 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. Therefore, three practical results are obtained from it:

- 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.
- One of the break-even points is disproportionate. Since it makes the company vulnerable to changes in production (sales) levels.

۸-٥- 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 ۳۰٪ is over۱۲۹,۷۸ billion 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 ۳۸,٥٪ and compared to the Minimum Attractive Rate of Return, it is favorable.

Table (۱٥): Project Return Index

Index	Amount	Unit of measurement
The Present Value of The Total Cost of The Period of Construction Phase and Production Phase	۳,۲۱۳,۷۹٤	Million Rials
The Present Value of The Total Income of Construction Phase and Production Phase	۳,۳٤۳,٥۸۳	Million Rials
NET PRESENT VALUE (NPV)	۱۲۹,۷۸۹	Million Rials
Cost-benefit RATIO (B/C)	۱.۰٤	-
INTERNAL RATE OF RETURN (IRR)	٪۳۸.٥	Percent
NPV RATIO (PI)	۰.۲۳	Rial per Rial of investment
NORMAL PAYBACK	۳.۱۸	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 is the period of time required to recover the project investment from net income, measured in years. In other words, it shows the length of time taken for the initial investment to be returned. This index shows the speed of investment return and the amount of project risk coverage. The ROR (simple) of the plan is estimated to be ۳.۱۸years (equal to the year ۱٤۰۷) according to the calculations.

۸-٦-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 (١٦) shows the results of the sensitivity analysis regarding the variables of sales income, fixed assets and operating costs.

۸-٦-١- 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; ٤٪ increase in sales revenue of the plan, the internal rate of return will increase from ٣٨,٥٪ to ٤٦٪. On the contrary, in the case of a ٤٪ decrease in sales revenue, the internal rate of return of the project will decrease to ٣١٪.

Table (١٦): Sensitivity Analysis (Percentage of IRR changes caused by sales revenue, fixed assets and operating costs alteration)

Variation (%)	Sales revenue	Increase in fixed assets	Operating costs
-٢٠٪	٠٪	٤٦٪	٦٥٪
-٤٪	٣١٪	٤٠٪	٤٤٪
٠٪	٣٨.٥٪	٣٨.٥٪	٣٨.٥٪
٤٪	٤٦٪	٣٧٪	٣٣٪
٢٠٪	٧٣٪	٣٣٪	١٠٪

۸-٦-٢- Fixed Assets

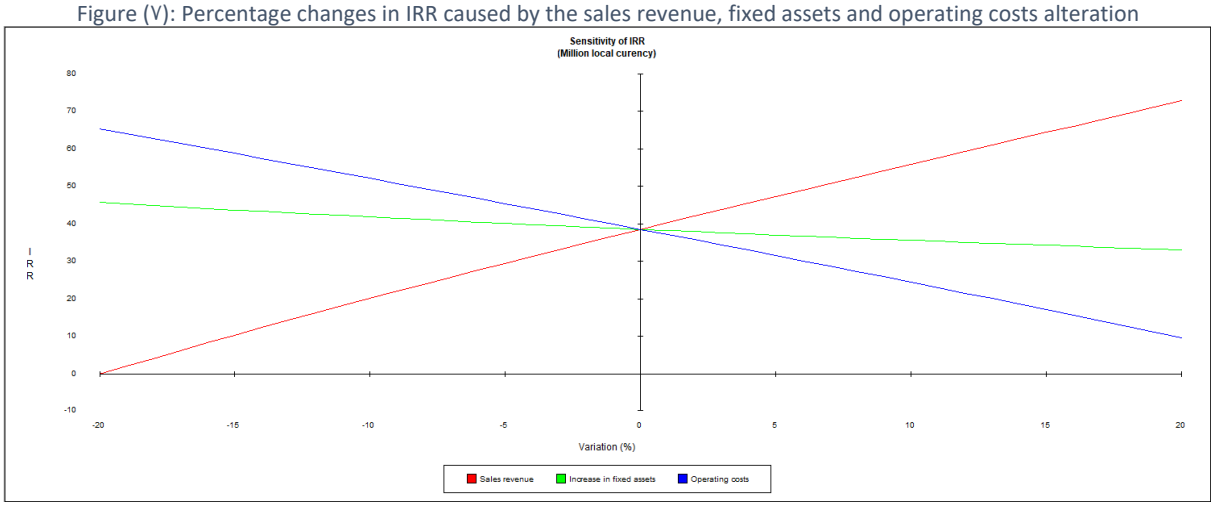
The change in the fixed assets is due to the fixed costs of the initial investment alterations. The results of the sensitivity analysis according to the fixed costs of the plan have been done and it shows that in case of an unexpected ٢٠٪ increase in the fixed capital costs of the project, the internal rate of return will decrease from ٣٨,٥٪ to ٣٣٪. Conversely, if there is a ٢٠٪ reduction in the fixed capital costs, the internal rate of return will increase and reach ٤٦٪.

۸-٦-٣- 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 ٢٠٪ increase in the operating costs, the efficiency rate of the plan will decrease to ١٠٪. On the contrary, if the total operating costs of the project are reduced by ٢٠٪, the internal rate of return will increase to ٦٥٪. 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 (٧): 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.

۸-۷- Conclusion

The implementation of the project in Maron Dam Lake and based on the construction and operation of ۳۰ cages in the area of coastal operations and unloading and loading terminal in an area of ۲,۰۰۰ square meters and the construction of a substructure of ۷٤۰ square meters is planned. The total investment in land and building is estimated at ٥٥ billion Rials and the total investment in main and auxiliary equipment is estimated at ۲۹۷ billion Rials. The total pre-operational costs are estimated at ۳٥ billion Rials, including the total fixed capital required is ۳۸۷ billion Rials and the total working capital required by the project is ۲٦۲ 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 ۱٤۰٤ is predicted at fixed prices equal to ٦۳۳ billion Rials. This figure will increase in the following years due to the increase in production capacity and will increase to a maximum of ۱,۲٦٦ billion Rials. The net profit of the plan has been positive in all years. The profit figure in ۱٤۰٤ is equal to ۷٦ billion. The profit will increase in the following years and will reach a maximum of ۲۷٤ billion Rials. The average annual profit of the mature plan is ۲٤۲ billion Rials and the average profit margin is expected to be ۱۹,۹٪. The internal rate of return (IRR) of the project is estimated at ۳۸,٥٪ and the payback period (PBP) is estimated at a maximum of ۳.۱۸ years. Also, the net present value of the project's cash flows (NPV) is positive and, considering the expected interest rate of ۳۰٪, is equal to ۱۳۰ 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 (۱۷): Summary of Economic Features

Nominal Capacity and Unit of Measurement	Product Name	Title Of the Project with ISIC Code	Title Of the Project
۱,۲۰۰ Ton	Types of fish - salmon - carp	Types of fish - salmon - carp (٥۰۰۳۱۲۳۰۱)	Fish breeding project in cages in Maron Dam Lake
Required Human Resource (Person)	Equity Shares (Million Rials)	Total Fixed Capital (Million Rials)	Project Duration
۳۸	۲٦۱,۷٦٤	۳۸۷,۲۰۰	۱۲
B/C	Applicant Available Cash (Million Rials)	Net Present Value (NPV) (Million Rials)	IRR (%)
۱.۰	٦٤۸,۹٦٤	۱۲۹,۷۸۹	٪۳۸.٥
ROI (%)	NPV Ratio / Profitability Index (Rial per Rial invested)	Dynamic Payback Period (Year)	Normal Payback Period (Year)
۳٥	۰.۲۳	٦.٦۸	۳.۱۸
Average Assets Turnover Ratio	Average Net Profit Margin (%)	Average Annual Profit (%)	Maximum Annual Sales (Million Rials)
۱.۲۳	٪۱۹.۹	۲۱۷,۹٥۳	۱,۲٦٦,۰۰۰

۸-۸- Estimation of currency rate fluctuation during the project implementation

The currency rate at the time of evaluation is included as described in Table (۱۸). 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 (۱۸): Currencies exchange Rate

Unit of Measurement	Unit Price	Currency
Rials	٤۱۳,۲۰٤	USD
Rials	٤٥۱,٥۳۱	EURO

Exchange rate of Central Bank, Exchange Trading System (ETS) dated ۰٥/۲٥/۱٤۰۲

۹) Investment Required, method of fundraising and guarantees

۹-۱- Foreign Currency Required

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

Table (۱۹): Foreign (Fixed) Currency Required

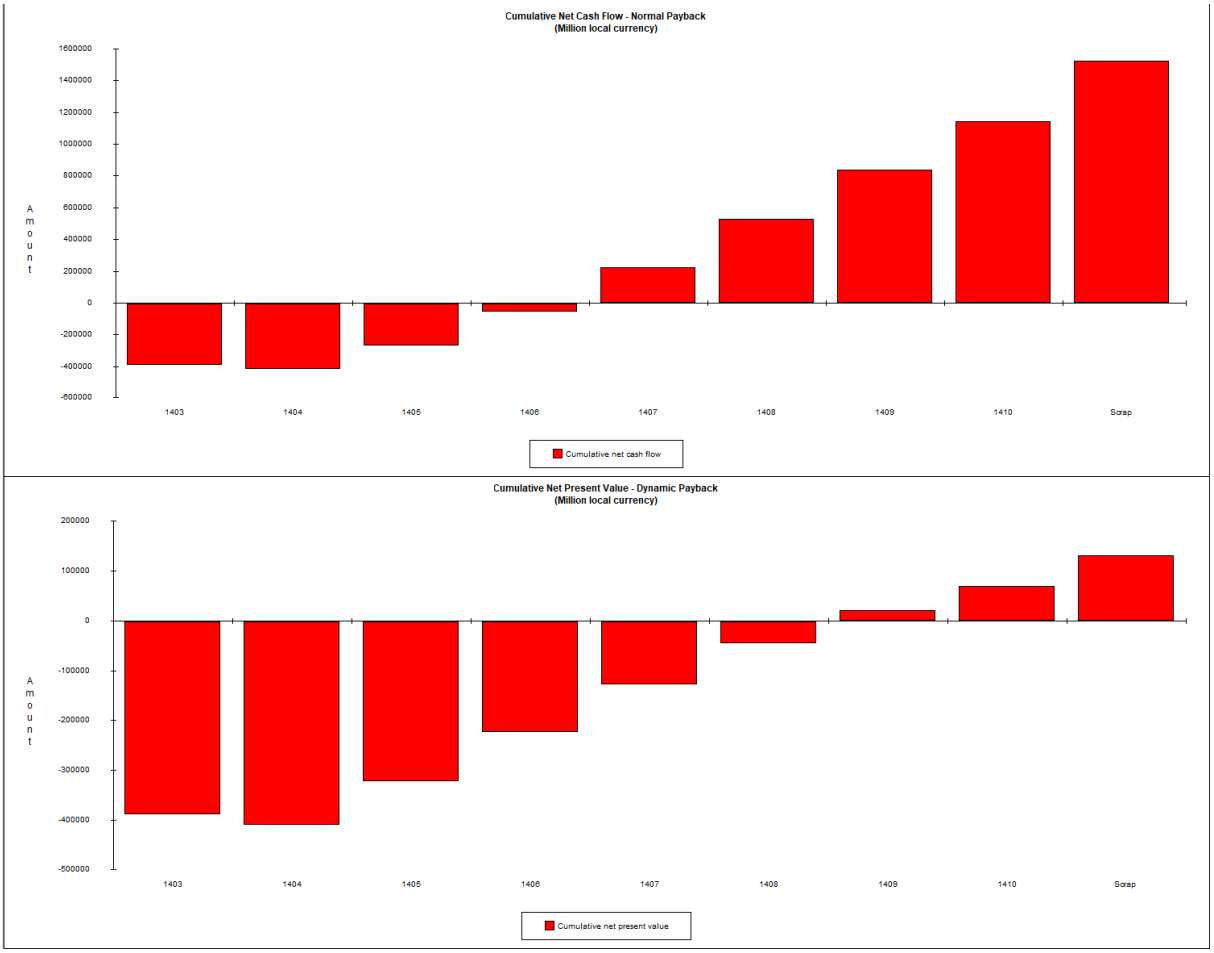
No.	Year	Required Investment
۱	Year ۱(٤۰۳ SH)	۰
۲	Year ۲	۰
۳	Year ۳	۰
٤	Year ٤	۰
٥	Year ٥	۰

۹-۲-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.

۹-۳-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 ۳,۱۸ years (equal to ۱٤۰۷) according to the calculations of CAMFAR.



Dynamic Payback Period of the plan is also estimated at ٥.٦٨ years.

۱۰) 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 ۷۰٪ of fixed capital by the Iran's state banks. This amount can be increased up to ۹۰٪ for deprived areas if foreign machinery is used. The interest rate of long-term facilities in the industry sector is ۲۳٪, 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 ۸ 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 (٦ to ۱۲ months) to use as working capital needed to carry out production processes, which will be provided up to ۷۰٪ 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 ۸۱ 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.

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(Attachment Number ۲)

Summery Sheet

Project introduction
۱. **Project Title**: Fish breeding plan in cages in Maron Dam Lake
۲. **Sector:** agriculture sub-sector: fish farming
۳. **Products/services:** Types of fish - salmon - carp
٤. **Location:** Khuzestan - BEHBAHAN - Maron dam lake
٥. **Project description:** The design and implementation of the project in Maron Dam Lake and based on the construction and operation of ۳۰ cages in the coastal area with an area of ۲,۰۰۰ square meters and the construction of the substructure of ۷٤۰ square meters is planned. The total investment in land and building is estimated at ٥٥ billion Rials and the total investment in main and auxiliary equipment is estimated at ۲۹۷ billion Rials. The total pre-operational costs are estimated at ۳٥ billion Rials, including the total fixed capital required is ۳۸۷ billion Rials and the total working capital required by the project is ۲٦۲ 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 ۱٤۰٤ is predicted at fixed prices equal to ٦۳۳ billion Rials. This figure will increase in the following years due to the increase in production capacity and will increase to a maximum of ۱,۲٦٦ billion Rials. The net profit of the plan has been positive in all years. The profit figure in ۱٤۰٤ is equal to ۷٦ billion. The profit will increase in the following years and will reach a maximum of ۲۷٤ billion Rials. The average annual profit of the mature plan is ۲٤۲ billion Rials and the average profit margin is expected to be ۱۹,۹٪. The internal rate of return (IRR) of the project is estimated at ۳۸,٥٪ and the payback period (PBP) is estimated at a maximum of ۳/۱۸ years. Also, the net present value of the project's cash flows (NPV) is positive and, considering the expected interest rate of ۳۰٪, is equal to ۱۳۰ billion Rials.
٦. **Annual Capacity:** ۱,۲۰۰ ton

Project Status
۷. **Local/internal raw material access**: ۱۰۰%
۸. **Sales:** ۱,۲٦٦ billion Rials **Anticipated local market:** ۹۰% **Anticipated export market:** ۱۰%
۹. **construction period:** ۱۲ months
۱۰. **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 Maron Dam Lake has been given. Based on this, the operator can use according to the relevant regulations to provide the plan and use the land on the edge of the Maroon Dam Lake. - 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. - Infrastructural utilities procured? No - List of know-how, machinery and equipment concluded? Yes. the desired equipment according to the conducted studies, including the equipment for flotation of cages, equipment for restraining cages on the bottom of the lake, required nets, floats, boats and fish sorters and other intelligent management systems in operation (including the food system) subsurface monitoring system, waste collection system, environmental data system, etc.). - Financing agreement for machinery, equipment and know-how concluded? No

Financial structure

۱۱. **Financial table:**

Description	Local Currency Required			Foreign Currency Required	Total Euro
	Million Rial	Exchange Rate	Euro		
Total Fixed Investment Costs	۳۸۷,۲۰۰	٤٥١,٥٣١	۸٥۷,٥۲۷	۰	۸٥۷,٥۲۷
Total Net Working Capital Requirements	۲٦۱,۷٦٤	٤٥١,٥٣١	٥۷۹,۷۲٥	۰	٥۷۹,۷۲٥
Total Investment	٦٤۸,۹٦٤	–	۱,٤۳۷,۲٥۲	۰	۱,٤۳۷,۲٥۲

- Value Of Foreign Equipment/Machinery: ۰ Euro
- Value Of Local Equipment/Machinery: ۱٥۱,٦۱۷ Euro
- Value Of Foreign Technical Know-How: ۰ Euro
- Value Of Local Technical Know-How: ۰ Euro
- Net Present Value (NPV): ۲۸۷,٤٤۲ Euro — Net present values discounted to: ۱٤۰۳
- Internal Rate of Return (IRR): ۳۸.٥٪
- Normal Payback: ۳.۱۸ year — Equivalent to ۳۸,۱٦ months
- Minimum Attractive Rate of Return: ۳۰٪

General information

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

Name / Company name: -

Address: Khuzestan - BEHBAHAN city - Maron dam lake

Tel: ۰۰۹۸ ۹۱٦ ۷۱۲۰٥۸٥ ۰٦۱۳۳۹۲۱۸۷٥ Fax:

Email: meisam.bavarsad@gmail.com Website:

Local entrepreneur: Private Sector ☑ government /public sector ☐