

Artificial spawning of *Rutilus frisii kutum* (Kamenskii, 1901) autumn form
MSGP-IR05-04

[Photo Gallery](#)

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Project Summary

Kutum is an exclusive and mono-type fish species inhabit in southern Caspian sea, its harvest range is between 8000-9000 tons annually, Second in rank after *Kilka* fishery in Iran. Kutum capture fishery grown well by restocking hatchery based fingerlings which are produced from spring form stock. Autumn form Kutum which was abundant in past years now diminished drastically. The endangering autumn form need rehabilitation procedures for enhancement, rare remaining tiny population should be captured in wild for hatchery production in a sea-ranching programmer. If this practice are performed autumn form Kutum will be restored at the same time its fishery will improve and the most needed economical relieve for fishermen strata will be achieved.

Background and problem statement

Kutum is an exclusive and mono - type fish species inhabit in Southern Caspian Sea, its harvest range is between 8000-9000 tons in a year, nearly 60% of the income of Bony fish fishery produced by kutum fishery. The stock of this species reduced drastically in 1982 and the catch slumped to the less than 1000 tons in a year.

Kutum spawning grounds deterioration, illegal catch, lack of restocking program was the main cause of the decline.

As has been known, kutum formed by two type of population, autumn and spring strain. The autumn form as phytophilous fish enter in southern inflowing rivers of Caspian during November till March, while spring form as lithophilous run at the beginning of March until late May. The autumn form kutum stay in rivers until reaching sexual maturity, but environment degradation of spawning ground diminished its population, drastically. Therefore, the conservation of autumn form became a necessity. By its sea-ranching not only its population would be preserved it may also improve its fishery. It is worth to be mentioned, by the effect of Caspian Sea Bony fishes Research Center's experts in 1983, artificial spawning and releasing the fries to the sea were commenced and the catch steadily improved. But all activities concerning restocking of kutum concentrated in spring form, as at present about 150 million its fries are released into sea for restocking, therefore, and emergency research planning are needed to rehabilitate the autumn form too. Achieving a well bio-normative for artificial spawning of autumn form a action plan not only help Iranian state fishery it is also possibly contribute neighboring Caspian states.

Goal and objective

Hatchery production of autumn strain of kutum for conservation and the protection of different races of this fish species recover genetic resources of kutum stock in Caspian sea, also contribute to the enhancement of fish production including improve fishery economy in the region.

REPORTS

The performance of the project has been started according to pre-determined date, 1st August 2005, in Inland Water Aquaculture Institute of IRAN. During the past three months, the main anticipated activities in first phase of operation have been pursued and carried out. The whole concerning activities were around to pivotal task:

- A. Organizing execution committee
- B. Preparation of tools and equipment to carry out the planned program

A. Organizing execution committee

To carry out the project optimally and taking advantage of the experts and scientific man-power contribution of the "Institute" two different committee are organized. The titles are given as catch and brooders maintaining committee, the other one, committee of propagation and larvae-culture includes fish fries production.

1. Catch and brooders maintaining committee

Committee in charge of brooders capturing in the running habitats:

A three time sessions have been held and following decision have been taken:

- The time was set for fishing activities from 23 September 2005, considering migration run.
- The brooders capturing grounds are discussed, the best areas being mapped out. The main canal of Anzali lagoon and its outlet branches toward Sea, Sefidrood river also Shalmanrood river are agreed, because the areas mentioned are historical natural habitats which most probably autumn form kutum might be run in these riverian system. The catching of brooders to be facilitated, bottom topography and depth status of fishing ground are examined. Local fishermen cooperation, their active participation for restoring the kutum recourses is demanded. In this matter, a workshop with local fishers as represent the main stakeholders being held and the significant of implementing the project have been elaborated and their effective collaboration for capturing spawners are requested.

Expert's consultation on spawners capturing resulted to choose the most applicable fishing tools which would not injure fishes, the chosen fishing tools are a follows: River purse seine, two wall drift net and Fyke net.

In this context the above fishing tools are designed and fabricated, being practically used on fishing operation.

For transporting the captured spwners from fishing ground and to minimize further stress of spawners an outboard boat (as aquarium boat) are designed and fabricated to carry brooders more safely, without undergoing stress until reaching its temporary or permanent destination.

It is intended part of brooders being kept in Sefidrood Fisheries Research Station, soft tarpaulin flexible containers are placed in a van, filled with water, oxygen are supplied for spawners transportation, the spawners are maintained in special brooder earthen ponds in the station's hatchery.

It has been also decided by expert group part of spwners, for development of its sexual gonads, to be kept within Anzali lagoon or in its natural environment, for this reason cages designed and constructed to achieve this pre-planned aim.

It is also planned the spawners captured in Sefidroud River being transferred by the special fish transferring van to the Sefidroud Fisheries Research Station, in this context the spawners from Shalmanroud River would be kept in the fish propagation complex of martyred Anssary. To diversify the spawners holding in different places produce ensured and enhance safety of the very valuable and scarce fish species of autumn form kutum.

Settle on the spawners holding cages have been conducted, when a careful survey of the area have been done. For this reason the environmental condition have been considered by physico-chemical monitoring, water depth measuring, water discharge status in cages places, accessibility to cages, security of cages would be solidified by establishing watchmen, a floating resting house which could be berthed near the cages area, the latter has have enough amenity for watchmen.

Further following management procedures would be undertaken:

- For collecting biological data the spawners would be tranquilized by dry pink flower.
- Sex separation in cages and soil ponds would be undertaken on 22th December.
- Environmental parameters on spawners collecting and holding site would be conducted, especially O₂, pH and EC will be recorded.
- Installation of electrical buoy on cages area enhances the safety.
- Coordination with Gilan province, department of environment and enforcement services for protection of aquatic resources of Caspian Sea in Iranian area.
- Public awareness activities and TV and press conferences targeted general public and other stakeholder of Gilan province.
- A color poster printed to appeal fishermen community for further participation on fish-stock restoring (poster 1).

Members of committee:

Dr. Ali Asghar Khanipour	(senior fishing technology expert)
Eng. Bahramali Razavi Saiyad	(fish multiplication expert)
Eng. Nouraldin Hosseinpour	(senior fish propagation expert)
Eng. Nasser Goroohi	(fish multiplication expert)
Eng. Sadegh Khatib	(fishing technology expert)
Eng. Mahmoud Vatadoost	(aquatic senior chemistry expert)
Eng. Seied Hojjat Khodaparast	(senior expert of aquatic chemistry)
Eng. Kambiz Khedmati	(fishing technology expert)

2. propagation and larvae-culture committee

Propagation and larvae-culture on the session held by committee's member, action plan are developed, brood stock management during holding period also strategy on culture of fish larvae are discussed, decision have been reached.

- Concerning on feeding the brooders, decision are taken to supply live feed such as "Gamaridae" to a batch spawners and the rest of brooders feed delivery are avoided. Anatomical study between two groups would show the gonad development circumstances.
- Spawners have been hold in earthen ponds, in case of need hormone treatment the pituitary glands are used.

- Incubation of eggs takes place in Zuge glass and Veis.
- As to ensure good results part of spawners for larvae production would be performed in Sefidrood Fisheries Research Station and the other group in Martyr Anssari Hatchery Complex.
- Simultaneous with artificial spawning, live feed production to feed the larvae would be undertaken, necessary facilities are under preparation.
- Larvae culture in earthen ponds would be done by artificial feed, the feed would be formulated by project manager.
- Fish fries would be released for restocking when they achieved 2-3g.
- The fish fry releasing would be managed by considering the brooders capturing locality.

The committee comprised by many subgroups each person is in-charge with his own specific responsibility. In this context the responsible expert submits his/her work plan to the project manager and the same time announces the facilities are need for fulfilling his work.

- Subgroup: mass production of live food to feed larvae
- Subgroup: artificial spawning of brooders
- Subgroup: feeding the larvae and culture management
- Subgroup: sanitary control and prevention of fish disease
- Subgroup: fish fries release for restocking

Members of committee:

Eng. Mohammad Hossein Toloeei	(senior fish propagation expert)
Eng. Nooraldin Hosseinpour	(senior fish propagation expert)
Dr. Asgar Zahmatkesh	(senior fish propagation and nutrition expert)
Dr. Shahram Behmanesh	(senior fish hormonotrapy expert)
Dr. Maryam Fallahi	(senior live food production expert)
Dr. Mohammad Saiyad Bourani	(senior fish fries releasing expert)
Eng. Gholamreza Mehdizadeh	(senior fish health management expert)

B. Preparation of tools and equipment to carry out the planned program

Data of this part have been brought in Annex 5B.