



**GENERAL FISHERIES COMMISSION FOR THE
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LA MÉDITERRANÉE**



**GFCM Workshop on artificial reefs in the Mediterranean and Black Sea
27 September 2013, Izmir, Turkey**

in collaboration with the FAO EastMed Project



and with the

**10th International Conference on Artificial Reefs and Related Aquatic Habitats (CARAH)
(23-27 September 2013, Izmir, Turkey)**



Artificial Reef Demand and Perception of Relevant Local Groups in Altinoluk (Turkey)

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Introduction

ARs have positive effects on CF and RF
(Seaman and Sprague, 1991)

ARs create services for different activities like;
SCUBA diving, RFetc.

ARs contributes to increase in welfare locally and
nationally (Ditton et al., 2001; Pendleton, 2004; Oh et al.,
2008; Morgana, 2009; Tunca, 2011; Tunca et al., 2012).

And ARs can play role in fisheries management...

Considering all these positive affects of ARs; MFAL has started a pilot project in Altinoluk (Edremit Bay) under the Master Plan of Turkish ARs.



What were appeared in our mind?

(from an economist's perspective)

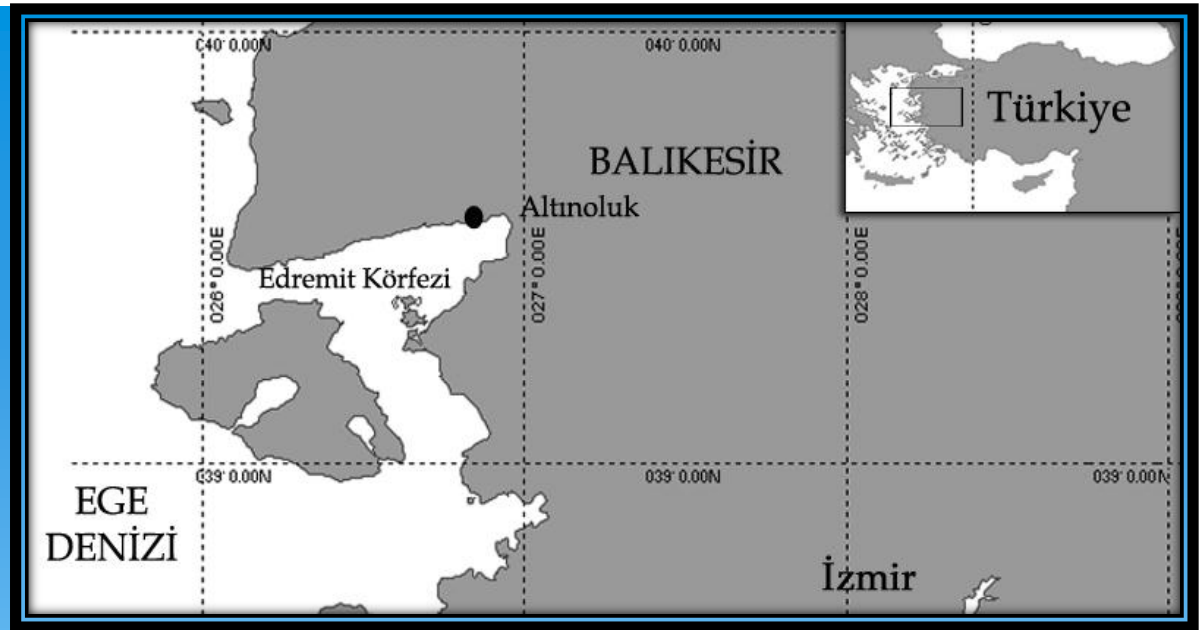
- Socioeconomic indicators,
- Direct/Indirect economic impact (Increased recreational and commercial demand, CPUE, VPUE etc),
- Perceptual analysis,
- Constant monitoring on above elements before and after reef deployment
- Synthesis of above and other related issues for co-management..

Study site

Altınoluk

Population: 13,800

Fishing,
agriculture, tourism..



*The pilot project site of Turkish National ARs Master Plan



*Fishery Cooperative

*Fishing harbour

*Diving charter

2 million USD, 25000 m³, 7.5 km², 7000 units...



Data collection and analysis

Questionnaires

Fieldwork

Face-to-face interviews



Küçük Çiftli Balıkçılık Anket Formu

Genel Bilgiler:

1. Tarih: ...

2. Bağlı balıkçı/öğrenci sayısı: ...

3. Kooperatif tipi: ...

4. Tümen no: ...

5. Tümen başı: ...

6. ...

Ortak Kooperatif İşleri

Üye oldunuz?

Baş görev aldınız mı?

Evet
 Yönetim kurulu

Balık Kooperatif Anket Formu

1. Kooperatifin adı
2. Kuruluş yılı
3. Kayıtlı ortak sayısı
4. Faal ortak sayısı
5. Üye olmayanların sayısı
6. Kayıt dışı balıkçı tekne sayısı
7. Kooperatifin faaliyet sahacındaki toplam balıkçı sayısı
8. Kooperatifin yıllık işlen hacmi (ton ve TL)
9. Kooperatifin denizdeki faaliyet alanı (konu)
10. Kooperatifin son yıl yapılan genel kuruluna kaç kişi katıldı?
11. Kooperatifin yıllar itibarıyla satın aldığı balık miktarı

Yıl	1997	1998	1999
...

Data collection and analysis

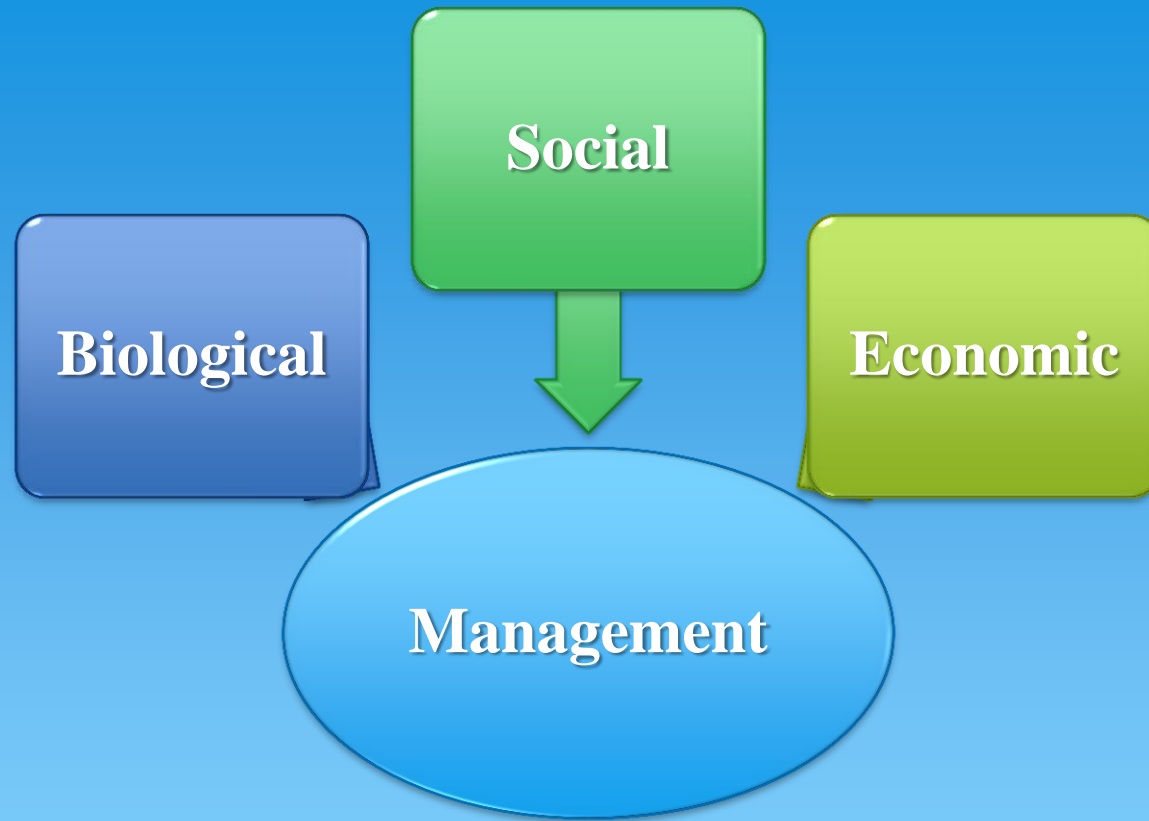
- 20 CF who are members of the Altinoluk Fishery Cooperative
- 58 boat and shore based recreational fishermen (RF)
- 67 local residents of Altinoluk with household survey

The proportional sampling size formula was used to determine above sampling sizes for each group with the following formulation according to 95% confidence intervals and 50% tolerances

$$n = \frac{Np(1-p)}{(N-1)\sigma_{px}^2 + p(1-p)}$$

Where n is the sample size, N is the population of each target group (e.g., CF, RF, LR), p is the contribution ratio to ARs (0.50 is fitted to reach the maximum sample size), and σ_{px}^2 is the variance.

Perceptual Analysis



13 statements covering relating above issues were assessed by **Likert Scale**

“1: Strongly disagree, 2: Somewhat agree, 3: Moderately agree, 4: Quite agree, 5: Strongly agree”

Results: Perceptual Analysis

Statements	CF	RF	LR	General
ARs increase biodiversity and biomass.	5	5	4.3	4.6
ARs increase the number of CF and RF vessels.	4.5	4.5	3.6	4
ARs increase the number of CF and RFishers.	4.4	4.4	4.1	4.2
ARs increase the number of diving clubs and their activities.	4.7	4.7	4.3	4.5
ARs protect some marine living species.	4.6	4.6	4.3	4.4
ARs help to put away conflicts rising among stakeholders related to use of marine zone.	2.5	2.5	3.4	3.4
ARs decrease pressure on natural reefs.	4	4	3.5	3.8

Results: Perceptual Analysis Statements	CF	RF	LR	General
ARs play important role on combating illegal fishing.	3.6	4.3	3.8	3.7
Constant control of ARs must be provided by a reef guard and employees.	4.3	4.6	4.7	4.6
Constant control of ARs must be provided by fishery cooperatives, diving organizations or municipalities.	4.6	3.8	4.2	4.2
ARs increase fishing pressure on the marine zone where it has practiced.	3.8	2.9	3.9	4
ARs cause more fishing gear damage.	2.9	3.1	3.2	3.1
ARs cause conflicts among divers, CF and RF on their use.	3.1	5	3	3.3

Results: AR Demand, Commercial Fishing Use

CF prefer fishing in the proposed ARs area.

45%- 101-200 days

55%- over 201 days



Results: AR Demand, Commercial Fishing Use

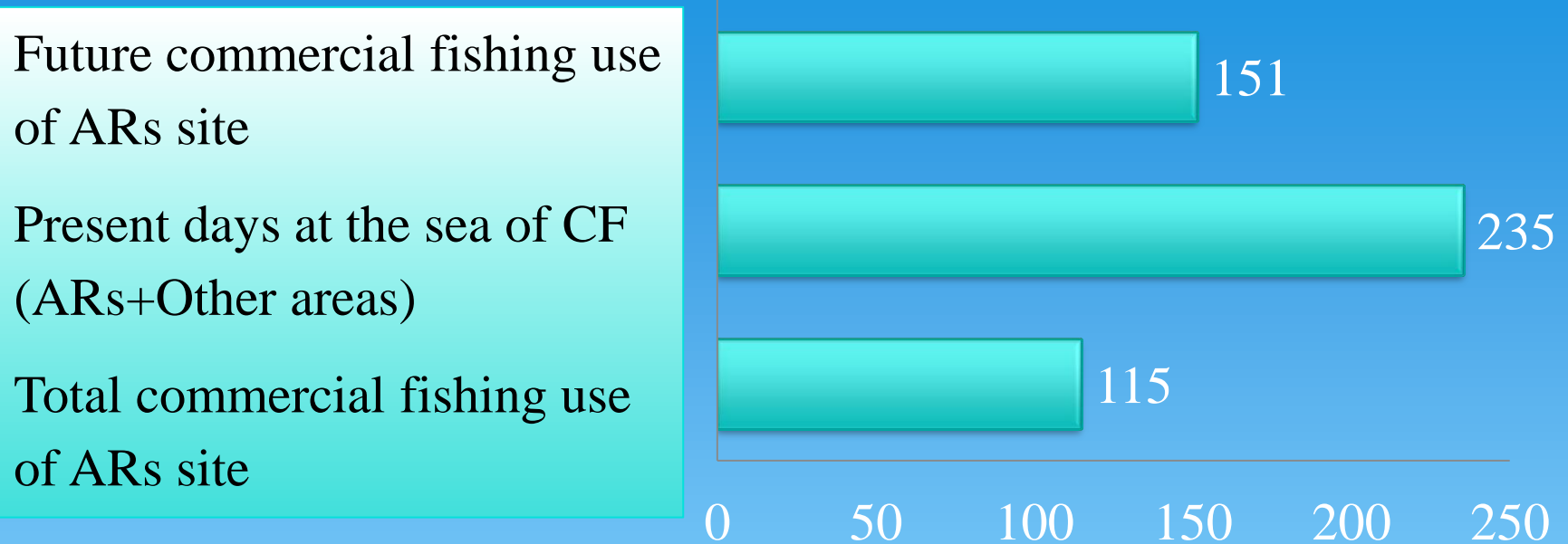


Figure Present and future mean number of CF use in ARs site

Yearly average commercial fishing days per fishermen: **235 days**

Present and future **CFdays** were as **115 and 151**, respectively.

After the attribution of numbers to all fishermen under cooperative (55):

Yearly **present and future demand** were assessed as **6325 and 8305 days**.

Results: AR Demand, Recreational Fishing Use



Figure Present and future mean number of RF use in ARs site

Considering around 400 recreational fishermen, present and future demand of ARs site were determined as **13,600** and **35,600** recreational fishing days, respectively.

Results: AR Demand, Local Residents' (LR) Use

Half of the respondents of LR declared that they use the ARs, especially, use the site for boat trips (63%), recreational fishing (14%) and recreational diving (9%).

Yearly total number of recreational days of LR including fishing, diving and boat trips were determined as 44 days.

It was calculated as 67 days with an increased (52%) willingness to participate after reef deployment of ARs.

Discussion and conclusion

- The respondents interviewed agree that ARs are useful to contribute to marine life positively.
- Positive perception also supports to the increase on CF, RF, recreational trip and SCUBA diving demand.
- Increase in willingness for CF (158%) and RF days (31%) in ARs site proves that ARs site determined successfully? Or it means another things????
- Willingness of the diving charter's head for diving trips to deployed ARs is a sign for more tourists, employments, expenses, taxes? Or ?

Socio-economic monitoring program should be started for the ARs ASAP.



Thanks...