Identification, Classification and Coding of Hengan Island Coastal Biotopes, using by CMECS / GIS Model

Mahbubeh Mehrdost, Ehsan Kamrani, Fereridoon Owfi, Hodeis Abbasi GHadikolaei

Abstract ***This study investigated Hengam Island coastline biotopes identification, classification and coding base on Coastal Marine Ecological Classification Standard (CMECS) model and using by GIS, in 8 stations during 2012-2013. Each ecological habitat biotopes, satellite figures analyzed and GIS cover placed divided to Surface Geology Component (SGC) and Biotic Cover Component (BCC) of different layers information. At last results showed 24 standard codes in Hengam island intertidal zone by CMECSIII and most of them obvious in western part of the area. So because of heterogeneous structure and various subhabitats in rocky coastline of the study area clarify a guideline for future Environmental planning, management and protected.***

Key words: Coastal biotopes, Ecological classification, CMECS, HENGAM Island, Persian Gulf.

I. INTRODUCTION

The coastal area is a confluence of land and marine ecosystems and includes the independent biological, ecological, and geological area. These are the dynamics areas including the interaction of land, water, atmosphere, and human manipulation (Beatley et al., 2002). Having a variety of ecologies, the coastal environment as a refuge for various species, is the most sensitive ecosystems on Earth; and the biological scientists have been interested in it due to its valuable economic resources (Sharifipour et al., 2006). This vulnerable area is exposed to the accumulation of terrestrial and marine pollutants and the potential threats by which the land processes directly affect on the sea processes and its applications (Owfi, 2005). The sea pollution and the consequence of economic-social development directly affect the coastal – marine ecologies. In addition, the development of industrial and servicing sets, human's increasing focuses, and increasing pressure on these areas, have changed the coastal areas and gradually the natural forms and especial ecologies transformed to the structures and centers of human activities; therefore, the natural resource managers and environmental planners are faced with the multiple problems in making decision for coastal- marine ecologies protection, sustainable utilizing of valuable resources and reserves, and Integrated Coastal Zone Management (ICZM) (Madden et al., 2005).

Manuscript Received on October 2014.

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Despite the fact that there are considerable information about the types of ecologies and their importance for various life stages of valuable fauna and flora species available, their knowledge about the diversity of ecologies, range and distribution of ecologies, and their ecological characteristics is negligible (Tyrrell, 2004) and this obliged them to make definitive decisions about the use of coastal-marine areas without having enough knowledge about ecologies; in addition, without the availability of basic and complete maps of coastal-Marine Environment based on the Geographical Information System (GIS), and Standard Ecological Classification of coastal-marine ecologies based on the available criteria and standards and management of resources and reserves, the implementation of programs and projects which protect the ecologies and sensitive and vulnerable settlements, will be delayed and the their condition assessment will become impossible (Lund and Wilbur, 2007). The ecology classification is a process in which the identification of multiple types of ecologies will be done based on the series of standard terms and descriptions (Lund and Wilbur, 2007).The Coastal Marine Ecological Classification Standard (CMECS) was developed with the input of over 40 coastal and 20 marine habitat to meet this need provide a universally accepted standard classification for coastal and marine habitats (Madden et al.,2005 & 2009).The main goal of CMECS is to classify ecological and habitat units within a simple standard format that uses a common terminology. CMECS provides a uniform protocol for identification and characterizing ecological units which is intended to allow monitoring, protection and restoration of unique biotic assemblages, protected species, critical habitats and important ecosystem component (Madden et al.,2009).Environmental Management Plan (EMP) and Integrated Coastal Zone Management (ICZM) is necessary to identify, coding and classification of valuable ecosystem and habitats in 3821 km southern and 873 km Northern Coast line of our country (Sharif pour and Owfi,2008).So on, there is an increasing need for classification of coastal and marine system due to resource management and habitat conservation goals. Many classification systems have been developed for regional or local applications (Cowardin et al., 1997; Allee et al., 2000; Connor et al.,2004) and this survey is the first recode and reports of ecological standards from Hengam Island in the Persian Gulf of Iran by protected sustainable development in fisheries, environmental management and usage

II. MATERIALS AND METHODS

Study Area: Hengam Island from 50km^2 board inside of 44 km of Qeashm Island is part of Shahab villages around the Qeashm town in the Persian Gulf water in the Strait of

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Hormuz between50 ° 54́ 40" to 55° 54́ 55" East length and 26° 36́ 43" to 26° 41́ 15 "North latitude by 8.9 km length and 3-6 km width (GOMA, 2004)

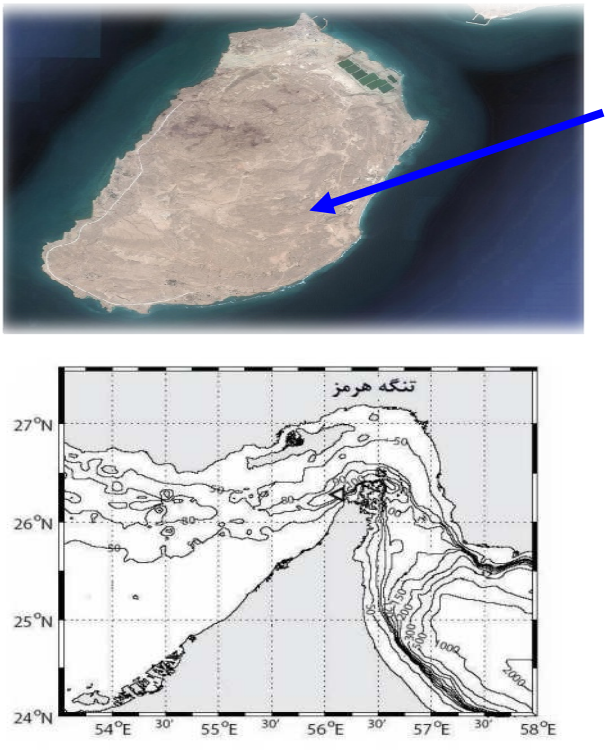

Figure1- Geographical Latitude of Hormoz Strait and Hengam Island

Filed study and sampling: At the first step were collected libraries information studies about the status of studied zone for costal and marine ecological classification standard and status of biological and non-biological zone .Certainly, collecting and classifying the current information of study area by the reports, thesis, etc. is very important, because the nature of CMECS model is based on the data analysis and history of previous Ecological studies. Addition to area's extent, simple data classifying the first field navigation, detect of stations along the Island coastline were done since the fall of 2012and determined eight station based on satellite map and figures by 60csx 2009 GPS (Vanzaling,1997). Dominant fauna and flora communities within the framework of distinct Biotopes were studied by the coastal-marine examination and survey, the fauna and flora dominant species in the area were examined based on the field information and taking the photographs, and for final confirmation of identification, the samples were transported to the laboratory, in addition the main physical - chemical and biological parameters ,the structure of seabed, and the slope of coast were measured in the place, and the information were recorded in the environmental data forms as the classifiers and modifiers in order to ease coding the ecologies. Moreover, the field operation and sampling in this research was conducted during a one-year period and four time surveys (in order to identify the potential effects of climate changes of seasons) in two semester of weather from high tide of the month so sampling in the area started from splash zone to lowest tide since 2012-2013. After transferring collected data from the GPS to computer (Garmin map software) and sorting and classifying the recorded information based on the information forms, the data will be classified according to UTM conservation and excel with CMECS model and the geographical coordinates will be prepared for the GIS map. Thus, each layer adds in Arc map territory based on modified color by TIF introduced and planed in stations and coastal zone.

CMECS: The third version of CMECS includes five components which each one describes different features of coastal-Marine environment and these components can be used alone or together. The examined components in this study include the Surface Geology Component (SGC) and the Biotic Cover Component (BCC) (Madden et al., 2009).Fixed names and codes are needed for facilitating the communication among the management, scientific and cooperative groups in the classification of ecologies. The encoding or name rules usually consist of a sequence of numbers or letters or both of them (Lund and Wilbur, 2007) and this encoding system can facilitate the information organizing in the geographic information systems (GIS) (Kutcher et al., 2005).For coding each component of SGC(Surface Geology; Class. Sub Class. Group) and BCC (Biotic Class. Sub Class. Group Biotic) following actions are implemented respectively.

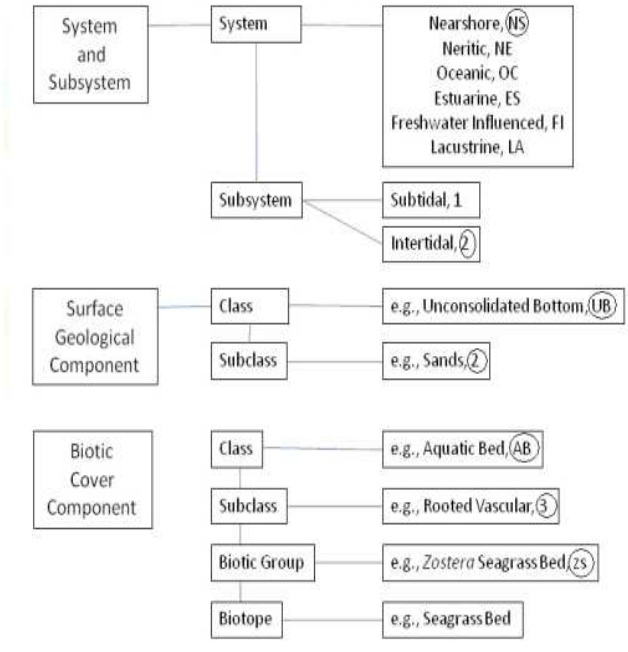

Figure 2 – Encoding the Spatial Information in the CMECS III Model

It is worth noting that the compliance of recorded field information with the BCC table was conducted precisely and according to the characteristics of each Biotope. Besides, it is possible to introduce a new ecology with a new (exclusive) standard code because among the features of this model introducing the ecologies is unique. In addition, this model does not aim to identify the species in Taxon species range; therefore the ecologies are encoded based on the biotopes and the dominant environmental groups in the region especially for communities living in the area. It should be noted that the classification of CMECS model has been implemented just in few regions of America due to being new. According to the single evolution of this classification and the designers' statement, its strengths and weaknesses should be identified by executing and selecting

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its criteria in different ecologies and areas like (NS.2-S: UB.2-b: AB.3.zc.Zost mar).

III. RESULTS

Collected information in eight stations of the Hengam Island based on the (SGC) and the (BCC) version III were done and showed in tables 1-8.

Table 1- BCC and SGC codes in the first station (Hengam jetty) of Hengam Island CMECSIII

A biotic				**Biotic**				
System	**Subsystem**	**SGC**		**BCC**				
		Class	***Subclass***	***Class***	***Subclass***	***BioticGroup***	***Biotope***	***CMECS Code***
Near shore [NS]	***Intertidal [2]***	***Unconsolidated Substrate [US]***	**Sands[3]**	***Faunal Bed[FB]***	***Mobile Epifauna[2]***	***Mobile Gastropoda [mg]***	***blandaMitrella Lunella coronata Neritia albicilla Palanxis sulcatus Cerithium caeruleum***	***NS2-s:US3-b:FB2.mm./ Mit blan/Lun cor/Ner albi/Pala sul/Cer caer/.***
						Mobile Echinodermata [me]	***Echinometra mathaei Diadema setosum Holothuria leucospilota***	***NS2-s:US3-b:FB2.me./ Echi math/Holo leuc/Dia seto/.***
						Mobile Crustaceans [mc]	***Grapsus albolineatus***	***NS2-s:US3-b:FB2.mc. /Grap albo/. .***
					Sessile Epifauna[1]	***Tunicate Bed [tb]***	***Phallusia nigra***	***NS2-s:US3-b:FB1.tb./Phal nig/.***
				Aquatic Bed [AB]	***Macroalgae [1]***	***Attached Ephemeral Macroalgae [ae]***	***Caulerpa racemosa Caulerpa peltata***	***NS2-s:US3-b:AB1.ae. /Caul rac/caul pel/.***

Table 2- BCC and SGC codes in the Second station (seasonal pool) of Hengam Island CMECSIII

A biotic				Biotic				
System	Subsystem	SGC		BCC				
		Class	Subclass	Class	Subclass	BioticGroup	Biotope	CMECS Code
Near shore [NS]	Intertidal [2]	Rock Substrate [RS]	Bedrock [1]	Faunal Bed [FB]	Mobile Epifauna [2]	Mobile Crustaceans [mc]	Eriphia smithi	NS2-s:RS1-b:FB2.mc. /Eri smi/.
						Mobile Gastropoda [mg]	Lunella coronate Planaxis sulcatus Thais savignyi Neritia sp.	NS2-s:RS1-b:FB2.mg. / Lun cor/ Pla sul/ /Thai sav /Neri sp/.
						sea urchins[sc]	Echinometra mathaei	NS2-s: RS2-b:FB2.sc. /Echi math/
				Aquatic Bed [AB]	Macroalgae [1]	Attached Ephemeral Macroalgae [ae]	Padina.sp Colpomenia sinuosa	NS2-s:RS1-b:AB.ae. Pad.sp/ Cop sin/.//

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Table 3- BCC and SGC codes in the Third station (old fuel depot) of Hengam Island CMECSIII

A biotic				Biotic				
System	***Subsystem***	***SGC***		***BCC***				
		Class	***Subclass***	***Class***	***Subclass***	***Biotic Group***	***Biotope***	***CMECS Code***
Near shore [NS]	***Intertidal [2]***	***Rock Substrate [RS]***	***Pavement [2]***	***Faunal Bed [FB]***	***Mobile Epifauna[2]***	***Mobile Gastropoda [mg]***	***Cerithium caeruleum Planaxis sulcatus Thais savignyi***	***NS2-s:RS2-b:FB2.mg. Cer Cae/ Pla sul/Th ai sav/.***
						sea urchins[sc]	***Echinometra mathaei***	***NS2-s:RS2-b:FB2.sc. Echi math/./***
						Mobile Crustaceans [mc]	***Eriphia smithi***	***NS2-s:RS2-b:FB2.mc. /Eri smiti /.***
		Unconsolidated Substrate [US]	***Sands[3]***					
				Aquatic Bed [AB]	***Macro algae [1]***	***Attached Ephemeral Macro algae [ae]***	***Colpomenia sinuosa Padina.sp***	***NS2-s;RS2-b:AB1.ae. /Col sin/pa d sp/.***

Table 4- BCC and SGC codes in the Fourth station (Qill village) of Hengam Island CMECSIII

A biotic				Biotic				
System	Subsystem	SGC		BCC				
		Class	Subclass	Class	Subclass	Biotic Group	Biotope	CMECS Code
Near shore [NS]	Intertidal [2]	Rock Substrate [RS]	Pavement [2]	Faunal Bed [FB]	Mobile Epifauna [2]	Mobile Crustaceans [mc]	Eriphia smithi	NS2-s:RS2-b;FB2.mc. /Eri smi/.
						Mobile Gastropoda [mg]	Cerithium sp	NS2-s:RS2-b:FB2.mg. Cer sp/./
		Unconsolidated Substrate [US]	Sands [3]			Mobile Echinoderm ata [me]	Echinometra mathaei Ophiocoma.sp	NS2-s:RS2-b:FB2.me. Echi math// Ophi sp/./
				Aquatic Bed [AB]	Macro algae [1]	Attached Ephemeral Macro algae [ae]	Padina.sp Colpomenia sinuosa	NS2-s:RS2-b:AB.ea. Pad.sp// Cop sin/./

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Table 5- BCC and SGC codes in the Fifth station (khamasi Cape) of Hengam Island CMECSIII

A biotic				*Biotic*				
System	*Subsystem*	*SGC*		*BCC*				
		Class	*Subclass*	*Class*	*Subclass*	*Biotic Group*	*Biotope*	*CMECS Code*
Near shore [NS]	*Intertidal [2]*	*Rock Substrate [RS]*	*Pavement [2]*	*Faunal Bed [FB]*	*Mobile Epifauna [2]*	*Mobile Crustaceans [mc]*	*Eriphia smithi*	*NS2-s: RS2-b:FB2.mc. /Eri smi/.*
						sea urchins[sc]	*Echinometra mathaei*	*NS2-s: RS2b:FB2.sc. /Echi math/.*
		Unconsolidated Substrate [US]	*Sands [3]*		*Sessile Epifauna [1]*	*Mollusca Bed[mb]*	*Saccostrea cucullata*	*NS2-s: RS2-b:FB2.mb. Sacc cucu/../*
						Tunicate Bed [tb]	*Polyclinum constellatum*	*NS2-s: RS2-b:FB1.tb. /poly cons/.*
				Aquatic Bed [AB]	*Macroalgae [1]*	*Attached Ephemeral Macroalgae [ae]*	*Turbinaria ornata*	*NS2-s: RS2-b:AB1.ae. Turb orn/./*

Table 6- BCC and SGC codes in the Sixth station (Old Hengam) of Hengam Island CMECSIII

A biotic				***Biotic***				
System	***Subsystem***	***SGC***		***BCC***				
		Class	***Subclass***	***Class***	***Subclass***	***BioticGroup***	***Biotope***	***CMECS Code***
Near shore [NS]	***Intertidal [2]***	***Rock Substrate [RS]***	***Bedrock [1]***	***Faunal Bed [FB]***	***Mobile Epifauna [2]***	***Mobile Crustaceans [mc]***	***Eriphia smithi***	***NS2-s:RS1-b:FB2.mc. /Eri smi***
						Mobile Echinodermata [me]	***Echinometra mathaei Holothuria leucospilota. Ophiocoma.sp Linckia multiflora***	***NS2-s:RS2-b:FB2.me. /Ophi sp./Echi math/ / Hol.leue /Lin mul.***
						Mobile Gastropoda [mg]	***Cerithium caeruleum Strombus sp***	***NS2-s:RS1-b:FB2.mg. Cer Cae/Str sp/./***
				Aquatic Bed [AB]	***Macroalgae [1]***	***Attached Ephemeral Macroalgae [ae]]***	***Padina.sp Laurenica.sp***	***NS2-s:RS1-b:AB1.ae. Pad sp/Lau sp/./***

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Table7- BCC and SGC codes in the Seventh station (Shaghabi Garden) of Hengam Island CMECS III

A biotic				*Biotic*				
System	*Subsystem*	*SGC*		*BCC*				
		Class	*Subclass*	*Class*	*Subclass*	*Biotic Group*	*Biotope*	*CMECS Code*
Near shore [NS]	*Intertidal [2]*	*Rock Substrate [RS]*	*Pavement [2]*	*Faunal Bed [FB]*	*Sessile Epifauna[1]*	*Mollusca Bed[mb]*	*Saccostrea cucullata Mytilus philippnarum*	*NS2-s:RS2-b:FB1.mb./sacc cuc/Myt phili/.*
		Unconsolidated Substrate [US]	*Sand [3]*		*Mobile Epifauna [2]*	*Mobile Crustaceans [mc]*	*Grapsus albolineatus*	*NS2-s:RS2-b:FB2.mc./Grap albo/.*

Table 8- BCC and SGC codes in the Eighth station (Hengam Rock) of Hengam Island CMECSIII

A biotic				*Biotic*				
System	Subsystem	*SGC*		**BCC**				
		Class	*Subclass*	*Class*	*Subclass*	*BioticGroup*	*Biotope*	*CMECS Code*
Near shore [NS]	*Intertidal* [2]	*Rock Substrate [RS]*	*Bedrock [1]*	*Faunal Bed [FB]*	*Mobile Epifauna [2]*	*Mobile Crustaceans [mc]*	*Eriphia smithi Grapsus albolineatus*	*NS2-s:RS1-b:FB2.mc./Eri smi/Gra albo/.*
						Mobile [mg]	*Thais savignyi Nerita.sp Planaxis sulcatus Strombus sp*	*NS2-s;RS1-b;FB2.mg./Thai sav/Neri sp/ Pla sul/ /Str sp /.*
				Aquatic Bed [AB]	*Macroalgae [1]*	*Attached Gastropoda Ephemeral Macroalgae [ae]*	*Centroceras clavulatus*	*NS2-s:RS1-b:AB1.ae./Cent cla/.*

According to tables 1-8, based on the classification of CMECS IIIl ; 24 ecological group classification were identified in GSC and BCC in the study area (Hengam Island).Finally the map of ecologies was prepared based on these standard codes. These results suggest that the CMECS is a suitable and efficient system for understanding the coastal and marine ecologies zone classifying in the southern parts of the Persian Gulf.

IV. DISCUSION AND CONCLUSION

The results of conducted study deltaic ecologies (permanent and seasonal rivers), lagoon, Salt marsh ecologies, and the forest one and limited to the coastal and sand –gravel ecologies as the dominant diversity of the survey. In addition to seasonal environmental changes influence to two periods of time fluctuations in the spring - summer and autumn – winter weather. Were identified by CMECS III 24 standard codes which were influenced in Marine water and these numbers of ecologies were related to BCC and SGC of the Hengam Island study. SGC of Island beach indicated, there were geological base of the area and there were not bottom dweller activation classified in stations. Also the most of BCC indicated high habitats Varity in the area. Sand- gravel habitats (Hengam wharf station) cause to increase the artificial substrate had high biodiversities. Also sand –rocky habitats (Khomasi station) there are 5 standard codes and high amount of them cause to increased amounts of stone habitats. Even though in (Shaghabi Garden

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situation) sand –rocky habitats in eastern part of the Island shown two standard codes in CMECS pattern by low amount of them because of sharp slope, there weren't any suitable shelter for biota living and waves grave activity. In addition to result shows decreasing bottom discord form western to eastern of the Hengam coastline, if we have High amount of bottom discord there are benefit environment, small and various habitats for benthic animal species (Kaiser etal.,2002). For other stations of the Hengam Island intertidal zone indicated same features of tidal pools, Rip Rap stones separated from the coast and new shelters cause to erosion and waves activities so, make a safe and security place for coastal fauna and flora(Owfi etal.,2 009).This tidal pools are low extent and in some cases covered by smooth layer of fine because of physical substrate erosion so on, established suite area for sea urchins, sea cucumbers and brown algae (Lund and Wilbur, 2007; Sharifpour and Owfi, 2008; Madden et al., 2009).Also seasonal torrent, water and coastal erosion in rivers and marine environment cause to high tide , splashed of shores(Kutcher, 2005). In the other hand established amount of study stations in front of Hormuz strait and maximum slope cause to Hengam Island shoreline erosion, hence to the results of sediment classification showed high amount of sand, low amount of clay and silts which indicated increased the waves activity in intertidal zone of the survey. Furthermore base of BCC CMECS III (Madden et al.,2009) coastal zone (sand –gravel, sand –Rocky, Rocky-gravel zone) of Hengam Island are ecological important areas and unique habitats that there weren't in managed habitats group so on , the codes and classifying system must be done in this area and modified standard changed about each habit and habitats of that by specific code in the marine environment sustainable management and development plan to the best knowledge of intertidal coastal habitats.

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Paper. International Conference on Synergy between Aquaculture and Oceanography .Malaysia, Present the Paper. International management conference, Tehran ,Iran. Methods for the Science and Management of Estuarine and Coastal Areas, With Emphasis on Coral Reefs and Mangroves, workshop leaders: Professor Mike Elliot, Dr. Andrew Lawrence From university of Hull and Dr. Teresa Fernandes from Napier university, UK, Bandar Abbas University of Hormozgan, Iran. Monitoring Methods, Data and Information Management of Coral Reefs, Workshop leader: Professor Clive Wilkinson from Global Coordinator of GCRMN, Australia, INCO, Tehran Iran. First International Congress on Documenting, Analyzing and Managing Biodiversity in the Middle East, present the paper. Stock Assessment and Management of Prawns in the Persian Gulf, Workshop leader: Prof. M. G .King from Australia Tuna and Tuna like fishes stock assessment in the Persian Gulf, Workshop leader: Dr. Tom Nishida. Also Hormozgan University publication published Biology & Aquaculture of Sea cucumber book by A. Salarzadeh cooperation in2011.fether more illustrates more than 35 ISI, research & Scientific articles about my area experiences since1999- present .Some of my competed research projects included in Determination the Biomass of Shrimp Stock in the Coastal Waters of Hormozgan Province.Shrimp Catch Analysis in Hormozgan Province. Demersal Fish Stock Estimation in the Iranian Parts of Persian Gulf. Kiddi Shrimp Population Dynamics in the Coastal Waters of Hormozgan Province. Pearl Oyster (*P. radiata*) Stock Assessment in the Bandar Lengeh Coastal Waters. Shrimp Larvae Survey in the Mangrove Creeks in Coastal Waters of Hormozgan Province.Supervised Msc Project, Culture Of Rainbow Trout Larvae With Enriched Artemia. Supervised Msc Project, Biometry & Population Dynamics Of Kiddy Shrimp In The Persian Gulf.Supervised Msc project, Mangrove Ecology with Emphasis on Biodiversity in the Northern Persian Gulf. I supervised and co-advised more than 20 Msc thesis on Marine biology and Fisheries in recent 4 years and Mangrove Ecology with Emphasis on Marine Living Things Biodiversity Index (Common between Liverpool University and Hormozgan University, Identification of Freshwater Fishes in the Inland Waters of Hormozgan Province. (Common between Canadian Natural Museum in Ottawa and Hormozgan University) are my Present Research Area. Members Of The NTFs, ICLARM, 1999-Present, Iranian Specialist Council (2003-Present), Agriculture and Natural resources Engineers society of Iran(2004-present) and Iranian oceanography society (2006-present)too.

Fereridoon Owfi, Marine Ecology Department Iranian Fisheries research Organization, Tehran. Iran Born in Abadan, Iran, 28December, 1963. University backgrounds are Bachelor of Science (B.Sc), Fishery & Environment from Tehran University, Tehran - Iran (1990).Master of Science (M.Sc.), Fisheries from Natural Resources University, Gorgan – Iran (1998)Ph.D, Marine Ecology, Research & Sciences University, Tehran – Iran (2008). Worked on Natural Resources Office, Shiraz – Iran as senior expert & research advisor. Persian Gulf Fisheries Research Center, Bushehr – Iran as research deputy and Iranian Fisheries Research Organization, Tehran – Iran as director of International Affairs Office & head of marine ecology department are my job experiences. Iam Academic staff and assistant professor of Iranian Fisheries Research Organization, head quarter –Tehran, have Master of Diving Instructor from Professional Association of Diving Instructors (PADI),Professional Wildlife & Nature Photographer of National Geography Society (NGS) & World Wildlife Federation (WWF) international certifications. My special filed study is Marine Eco- Biology, Ichthyology, Environmental Assessment Modeling, and Geomorphology of marine- coastal habitats. Also specialist in Sigma Plot, Map Source, MATLAB, GOP, Arc View, Arc Info, Idrisi**,** Garmin Page**,** Excel, SPSS, R, soft ware and Data Analysis Models of Ecology, Environmental and Fisheries by CMECS, PASTAKIA, SWOT, MEDWET, NOOA/HD, Neural Network.Other Expertise and Experiences consisting of Cooperation with regional and international organizations Advice and assistance in the design of museums and cultural centers.Cooperation with educational institutions, universities and training centers too.

Hodeis Abbasi GHadikolaei, PhD Student of Aquaculture ,Dept of fisheries, Faculty of Agriculture and Natural resources, Islamic Azad University, Tehran Science and Research Branch, Tehran. Iran .Born in Qaemshahr, Iran, 31August,1983. My university back grounds are Bachelor .Science of fishery from IAU of Savadkoh branch (2004).Master Science of fishery from, Islamic Azad University, Tehran Science and Research Branch, Tehran. Iran (2007). I was working in Scientific Applied University o f Babolsar as an aquatic animal ecology lecturer. Also I was Environmental pollutant lecturer in Pardis Khazar University and the Honor Member of Mazandaran jahad University. Specially Worked on Marine fish Ichthyology ,Morphology since 2005 - now.I was Oral lecturer for more than six article about The Persian Gulf and Oman sea Iranian waters of Marine eels (Anguiliformes Order and their Families taxon) from international conferences in Iran and overseas.Also cooperating with (Iranian fisheries Research Organization (IFRO) about this subject and same topics that refer to Marine Aquatic animals Ecology and diversities in Iran territorial waters. Published more than 7 ISC and scientific article in Scientific and research journal of Iran, and have more than20 article in different topics of Aquaculture since2006-2014. Also specialist in Ornamental fish culture, Fish nutrition, live food and used herbal medicine (organic matter) in aquaculture to provides the organic products, SPSS, Excel, power point soft ware. The member of WAS (2011-present).Associate member of Iranian Society of Ichthyology 2013- present.Associate member of young researchers and Elites club of Islamic Azad university(2002-present).

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