REBYC
Reduction of Environmental Impact from Tropical Shrimp Trawling, through the introduction of By-catch Reduction Technologies and Change of Management
(EP/GLO/201/GEF)

CUBA

Progress Report to the Project Coordinator
EP/GLO/201/GEF

July-December 2002

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Progress Report to the Project Coordinator EP/GLO/201/GEF

Country: CUBA
Reporting period (6-months from July to December/2002)
Reporting Officer: Luis Font Chávez – National Coordinator

Antecedents:

In spite of not depend of external finances to the development of the proposed activities in the project, at he beginning of year 2002, our country presented for approving and execution with national funds, a project named ¨Reduction of environment impact in tropical fisheries for trawling through the introduction of technologies to reduce by-catch and changes in management¨, having in mind in their objectives, activities in relation with the project with the same name EP/GLO/201/GEF.

This project was put under consideration for its approval by the Scientific Council of the Fisheries Research Center, in relation with objectives, methodology and expected results, following the proceeding established in our country, which is composed by 19 members of our Institution and 5 from other related institutions, the name and specialties are listed below:

Institution members

Elisa García Rodríguez	Director
Rafael Puga Milián	Subdirector
Rafael Tizol Correa	Subdirector
Raquel Silveira Coffigny	Subdirector
Carlos Carles Martin	Subdirector
Mireya Sosa Blanco	Subdirector
Lourdes Nodarse Díaz.	Project Chief
Luis Font Chavez	Project Chief
Gerardo Suárez Alvarez	Project Chief
Gustavo Arencibia Carballo	Project Chief
Lourdes Pérez Jar	Project Chief
Ma.Estela de León González	Project Chief
Enrique Jiménez Hurtado	Project Chief
Gilma Delgado Miranda	Project Chief
Roberto Piñeiro Soto	Project Chief
Félix Moncada Gavilán	Project Chief
Irma Alfonso Hernández	Project Chief

Other institution members:

Julio Baisre	Fisheries Regulations Director, MIP
María Isabel Lantero	Pharmacy and Foods Institute
Sara Gutierrez	Food Industry Investigation Institute
Ana María Suárez	Marine Fisheries Centre. H.U.
Dalia Salabarría	Information and Environmental Education Centre. AMA. CITMA

In the session, the principal appointments were in relation with the necessity of external financing for guarantee its execution in a right way and the continuity of the project. Also, the Fishery Enterprise of Santa Cruz del Sur was defined as the execution area. Under this approval level, it was proposed to the consideration of the Ministry of Fishery Industry, where its financing was approved by the Direction of Fisheries Regulations for an amount of $ 79511.74 (National money) under the regular program of research of the Fishery Research Center to the year 2002, for not accounting with external financing.

The execution of the project has been quarterly supervised by the Group of Experts of the Subdirection of Marine Shrimps, which it is composed by 6 members:

Mireya Sosa Blanco	Subdirectora
Luis Font Chávez	Jefe de Proyecto
Enrique Valdés Puente	Investigador Auxiliar
Gilma Delgado Miranda	MsC en Ecología
Mayra Balsinde Ruan	MsC en Ingeniería Alimentaria
Rafael Sánchez	MsC en Tecnología Pesquera

In the context of this working program, the activities in relation with the project EP/GLO/201/GEF, was the following:

- Design and construction of a twin shrimp net taking in mind the Mexican experiences in relation of reducing 30% in the length of the net and the addition of a piece of net of 30 meshes between the body of the net and the cod end, with the objective of maintain its hydrodynamics conditions (see attachment).
- Development of an experimental cruise to define the proper calibrations of the system and observe the results of the decrease of the by-catch and its effects on shrimp catches.
- Execution of commercial fisheries during 30 days and compare the catch with both systems.
- Cruises of massive sampling of the species of the by-catch to define species compositions and establish length-weight relations of principal species.
- Elaboration of 8 BRDs, type ¨fisheye¨ (4 circular of 200 mm diameter and 4 oval of 250 x 125 mm), to be incorporated to the design of the fishery system describe above.

Obtained results:

- An experimental cruise on board Ferrocemento 16 belonging to the Industrial Fishery Enterprise of Santa Cruz del Sur was realized during 5 to 11 of May/2002. Experimental and traditional nets were fixed in alternate way in order to reduce experimental error. The results of these 6 trawlings performed showed that the modified net didn't have significance differences in retention of the by-catch, although there was an increment between 2-3% in shrimp catches.
- The following 30 days, the vessel maintained a both fishing systems, under a commercial regime, and the results were similar. 120 trawlings of 3 hours duration were performed under the supervision of the skipper of the vessel.
- In June and Octuber, cruiser to the fishing area of Santa Cruz del Sur were performed with the objective of doing massive measuring of species and determine species composition from by-catch, obtaining the following results:

Resume Length-Weight relations for species (by-catch)					
Area: Sta Cruz del Sur (Cruisers july-october-2002)					
Especie	**b**	**a**	**r^2**	**N**	**Interv. of sizes (cm)**
Biajaiba (July) *L. synagris*	**3,1307**	**0,0116**	**0,9964**	**251**	**6,0-29,5**
Biajaiba (October) *L. synagris*	**2,9212**	**0,0237**	**0,9988**	**340**	**5,5-31,5**
Lenguado *Achirus lineatus*	**2,982**	**0,0119**	**0,9574**	**109**	**6,5-16,5**
Casabe *Chloroscombrus chrysurus*	**2,5626**	**0,0369**	**0,9747**	**197**	**3,5-23,5**
Rubio Volador *Prionatus punctatus*	**3,5387**	**0,0029**	**0,9846**	**191**	**6,5-23,0**
Verrugato *Micropogonias furnieri*	**3,0503**	**0,0156**	**0,9946**	**154**	**4,5-16,0**
Patao *Diapterus rhombeus*	**3,2792**	**0,0151**	**0,9916**	**199**	**3,5-15,5**
Serrano *Diplectrum formosum*	**3,6059**	**0,0029**	**0,9781**	**116**	**9,0-17,5**
Lagarto *Synodus foetens*	**3,5097**	**0,0016**	**0,9815**	**194**	**12,5-33,0**

Species composition **(June) Santa Cruz del Sur**

Species	Total Sample			
	Number	Weigth (g)	Mean Weight (g)	%
SHRIMPS		**18005**		
MOLLUSKS				
Almeja blanca	110	543	**4.9**	**1.3**
Almeja prieta	46	260	**5.7**	**0.6**
Calamar	13	173	**13.3**	**0.4**
Melongena	4	1170	**292.5**	**2.8**
Total Mollusks	**173**	**2146**		**5.1**
FISHES				
Bajonao	1	30	**30.0**	**0.1**
Biajaiba	58	3470	**59.8**	**8.2**
Blanquilla	4	25	**6.3**	**0.1**
Bothus	3	185	**61.7**	**0.4**
Casabe	377	2534	**6.7**	**6.0**
Clarin	93	2660	**28.6**	**6.3**
Corvina	10	720	**72.0**	**1.7**
Jorobado	3	3	**1.0**	**0.0**
Jurel	2	28	**14.0**	**0.1**
Lagarto	29	2465	**85.0**	**5.8**
Lija	9	42	**4.7**	**0.1**
Lisa	9	26	**2.9**	**0.1**
Mojarra	43	1325	**30.8**	**3.1**
Palometa	3	56	**18.7**	**0.1**
Patao	369	7475	**20.3**	**17.7**
Rubio	146	3535	**24.2**	**8.4**
Sar. Esca.	1	10	**10.0**	**0.0**
Serrano	127	2425	**19.1**	**5.7**
Tamboril	23	726	**31.6**	**1.7**
Tapaculo	125	887	**7.1**	**2.1**
Verrugato	16	705	**44.1**	**1.7**
Total Fishes	**1451**	**29332**		**69.3**
CRUSTACEANS				
Cangr. araña	1	120	**120.0**	**0.3**
Centolla	201	916	**4.6**	**2.2**
Gallito	3	130	**43.3**	**0.3**
Jaiba	38	1920	**50.5**	**4.5**
Manicure	1547	5970	**3.9**	**14.1**
Total crustaceans	**1790**	**9056**		**21.4**
OTHERS				
Squilla	125	1420	**11.4**	**3.4**
Estrella de mar	1	360	**360.0**	**0.9**
Total Others	**126**	**1780**		**4.2**
Total FAC	**0**	**42314**		**100.0**
Total Weight		**60494**		
FAC/shrimp		**2.4**		

- Fishes predominated with 69.3% from the total of the by-catch, and crustaceans and mollusks constitute 21.3% and 5.1% respectively. The by-catch-shrimp relationship for the sampled area was 2.4.

- The Ministry Resolution No. 211/2002 with date 22/07/2002, was declared in relation to the total closure of shrimp fishery in all the country, with the objective of protect the shrimp resource and its by-catch.
- 8 BRDs type ¨fisheye¨ were constructed, which will start to prove their efficiency in the month of January/2003 in experimental cruises in the operation area of the Industrial Fishery Enterprise of Santa Cruz del Sur.

List of financial input by government

Professional staff	$11,300
Travel expenses	3,900
Operating expenses	11.100
Vessel	5,400
Total	31,700

Estimation of by-catch reduction.

In spite our country is beginning the study about BDRs utilization and are not used al present, by-catch catches have a sensible decrease due to regulation measures applied to shrimp fisheries. This situation produced a strong reduction of fishing effort and its concentration in areas where the abundance is greater and lesser levels of by-catch, obtaining as a result, catches of higher quality, due to the small mechanic damage to the shrimps. In the table below the results from 1990-2000 are presented.

Year	Effort (fishing day)	Catch shrimp (ton)	Catch by-catch (ton)	Shrimp/by-catch relation
1990	15896	2380.0	17692.384	7.4
1991	14896	2853.4	16565.608	5.8
1992	16101	2651.8	16953.312	6.4
1993	14050	2719.4	11598.352	4.3
1994	14627	2227.7	14831.352	6.7
1995	14624	1843.2	12201.122	6.6
1996	13960	1665.7	8343.259	5.0
1997	11455	2000.3	11936.157	5.9
1998	8623	1239.8	8109.497	6.5
1999	9279	1485.0	4347.126	2.9
2000	9577	1536.8	2785.789	2.0

Nevertheless, with the development of the project and their results, it will be possible to reduce even more the by-catch capture, and produce benefits to the environment.

Annex

Experimental shrimp trawl, type 10,3/10,3 m