

OBJETIVE 4: BIOLOGICAL PARAMETERS

4.B.- BIOMETRICAL RELATIONSHIPS

Objective: To make available the necessary equations which permit the transformation of weight units into sizes by species and fishing method and/or vice versa.

Methodology: Acquirement of pairs of values for size and weight in their distinct presentations for red tuna and sword fish caught by different fishing systems. The development of the corresponding regression equations.

Results: During the development of the present project, size-weight relationships were developed for the red tuna and sword fish caught by different fishing methods. The same table includes different size/weight relationships developed by other authors and compiled for the present report

MOROCCO(INRH)

Objective 4.1b

The size-weight relations by condition of the swordfish and the bluefin tuna that we present in this report have been established and presented in the report of the project Thonides 98 jointly by INRH and IEO. **Table (4.1)** summarizes the main results. The different size-weight relations are also illustrated in **figures (4.1), (4.2), (4.3) and (4.4)**.

Table.4.1 : Different size-weight relations determined for the swordfish and the bluefin tuna.

SPECIES	GEAR	PORT	SIZE-WEIGHT RELATION	NUMBER
SWORDFISH	GILL	TANGER	$p_v=0.000002 * L_f^{3.4009}$	576
	GILL	NADOR	$p_v=0.000003 * L_f^{3.3033}$	141
TUNA	HAND	DIKY	$p_v=0.0101 * L_f^{1.7854}$	65
	TRAP	LARACHE	$p_v=0.00009 * L_f^{2.677}$	54

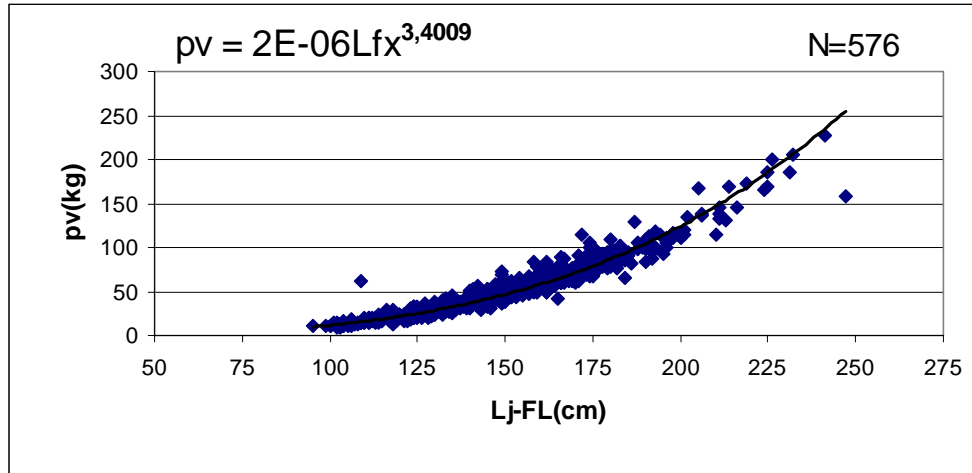


Fig.4.1 Size-weight relation of swordfish in the port of Tanger(Gill net 1998)

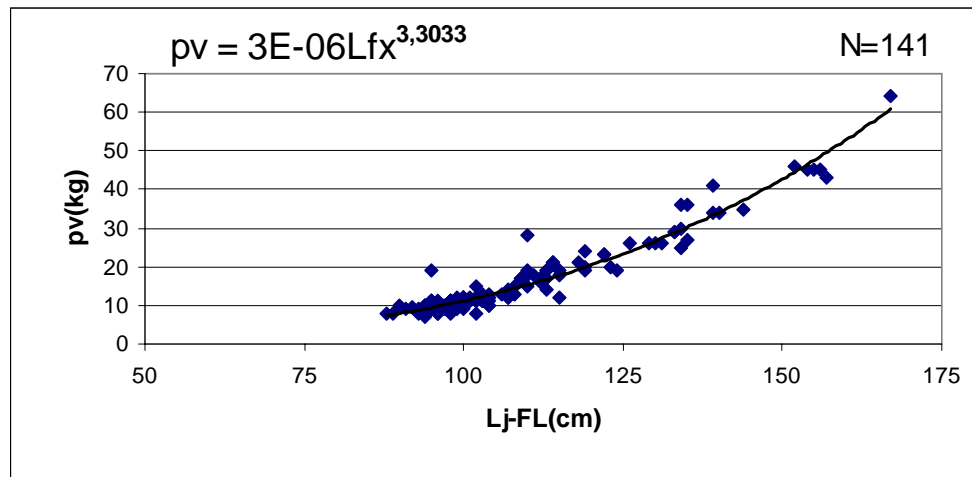


Fig.4.2 : Size-weight relation of swordfish in the port of Nador(Gill net 1999)

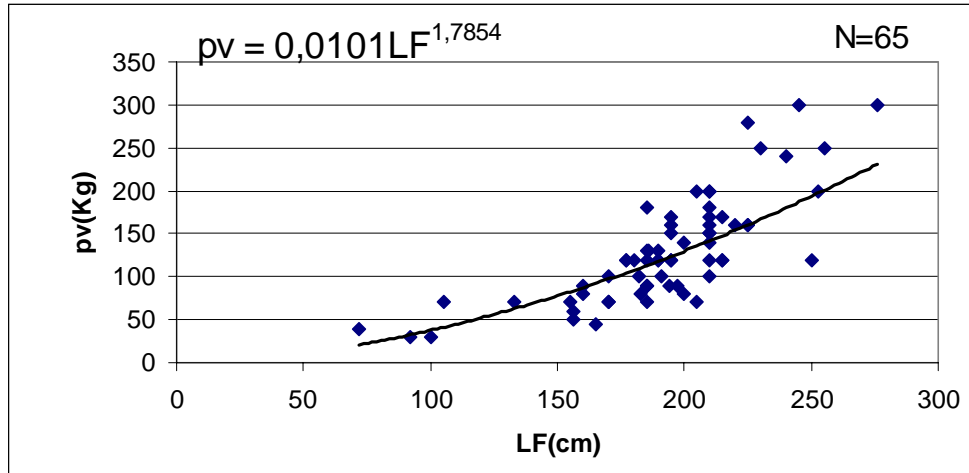


Fig.4.3: Size-weight relation of bluefin tuna (Hand 1998)

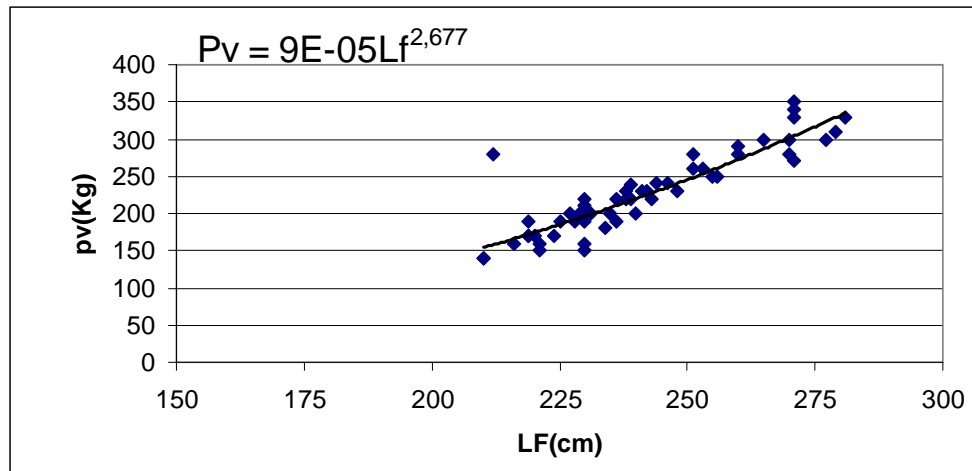


Fig.4.4 Size-weight relation of bluefin tuna (Trap 1997)

SPAIN (IEO)

Objective 4.2b

Size-weight relationships. The compilation of the biometrical size-weight relationships currently used for the corresponding transformations has been proceeded. Thus, **table 4.2** and **figures from 4.5 to 4.11** present equations and graphics of relative correspondence to the size-weight relationship of the red tuna (*Thunnus thynnus*), sword fish (*Xiphias gladius*), bullet (*Auxis spp*) and tunny (*Sarda sarda*) in their different presentations of weight and fisheries.

Species	Type of Relation	Fishing Method	Season	Area	Authors	Year	Weight-size Relationship
BFT	LH-RW	TRAP	Entry	Atlantic	R. Roda	1964	$RW=1.9 \text{ E-}05 \times LH^{3.000}$
BFT	LH-RW	TRAP	Exit	Atlantic	R. Roda	1964	$RW=5.3 \text{ E-}05 \times LH^{2.800}$
BFT	LH-RW	TRAP	Entry	Atlantic	Rey y Cort	No publicada	$RW=2.950 \text{ E-}05 \times LF^{2.898958}$
SWO	LJFL-RW	LLHB	Year	Mediterranean	Mejuto et al.	1987	$RW=8.905 \text{ E-}07 \times LJFL^{3.555}$
SWO	LJFL-DW	LLHB	Year	Mediterranean	De la serna et al.	1994	$DW=3.446 \text{ E-}07 \times LJFL^{3.692}$
FRI	LF-RW	TRAP	Year	Atl + Med	Ramos et al.	1986	$RW=1.66 \text{ E-}06 \times FL^{3.64257}$
BON	LF-RW	TRAP	Year	Atl + Med	Rey et al.	1984	$RW=7.24 \text{ E-}06 \times FL^{3.16446}$

RW= Living Fish
 DW= Eviscerated Fish
 LJFL= Longitud mandíbula inferior a la furca
 LF= Longitud a la furca

BFT= Red Tuna
 SWO= Sword Fish
 BON= Tunny
 FRI= Bullet

Tabla 4.2

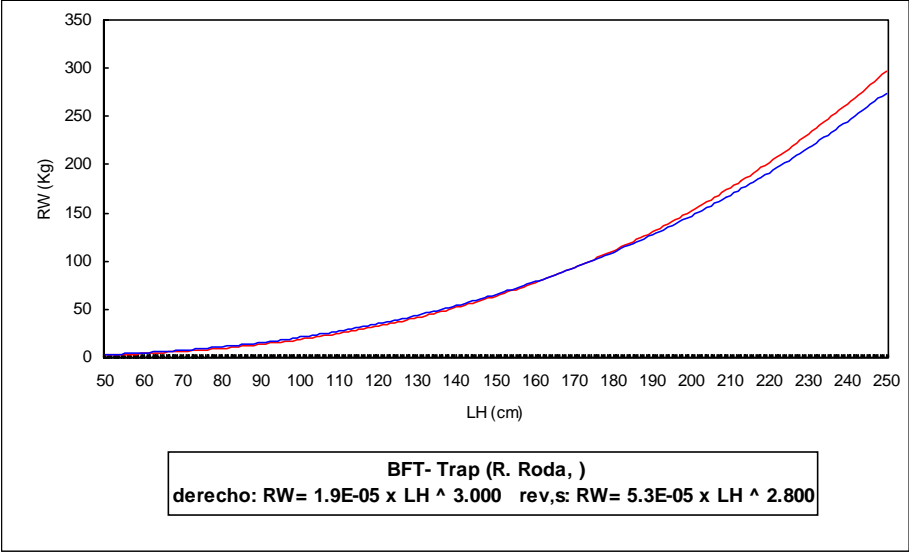


Figure 4.5

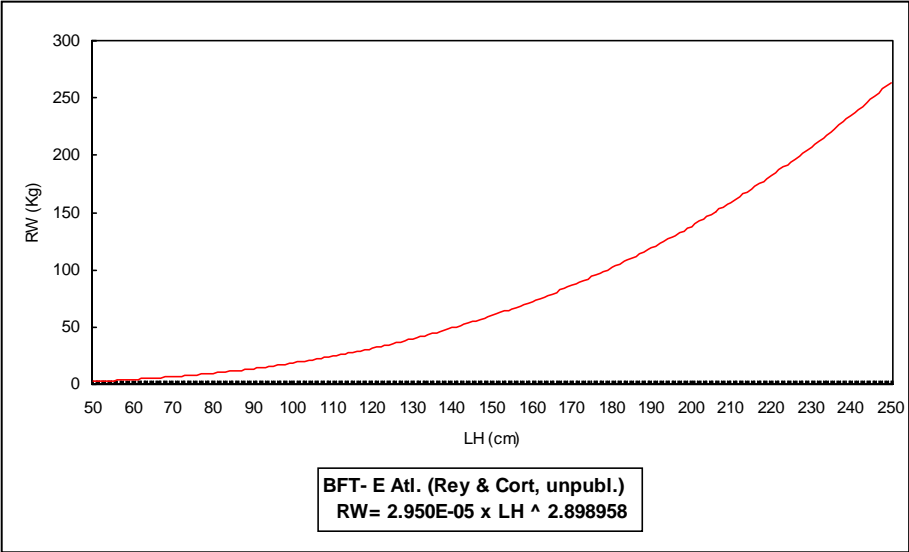


Figure 4.6

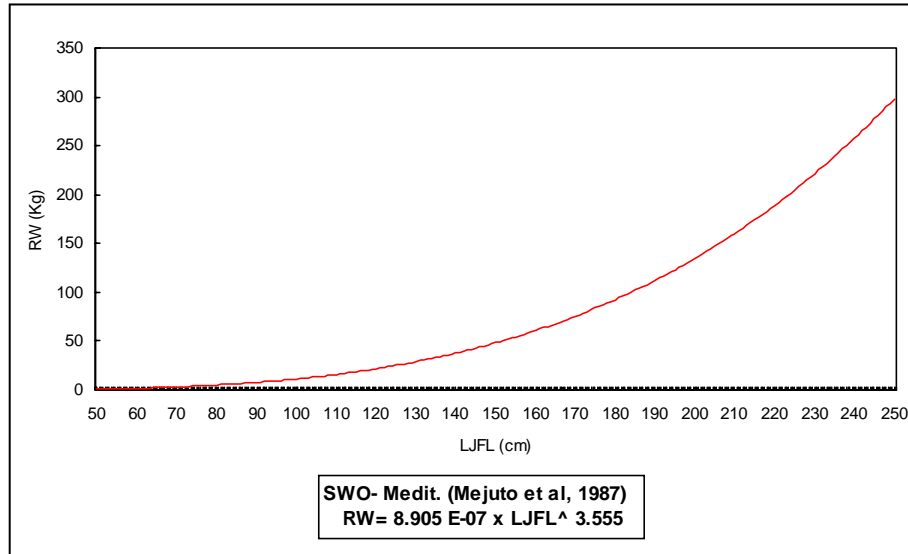


Figure 4.7

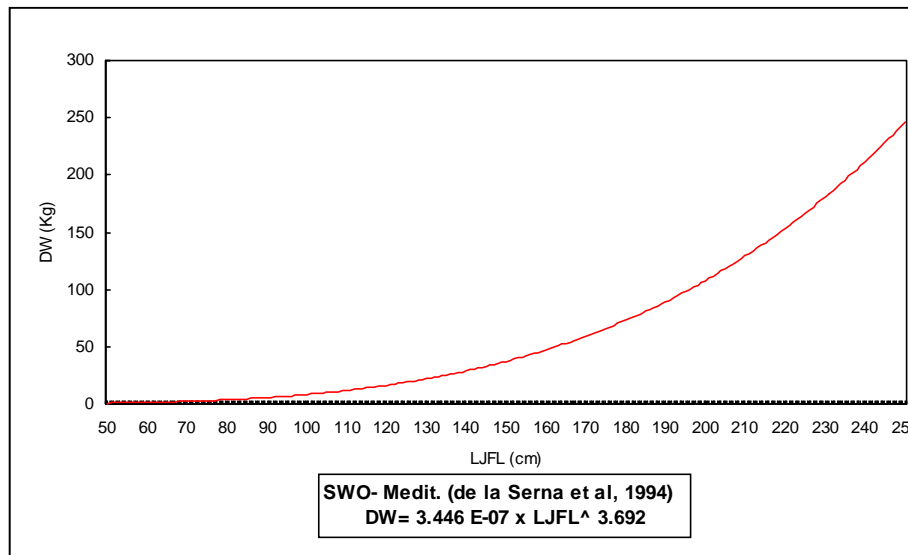


Figure 4.8

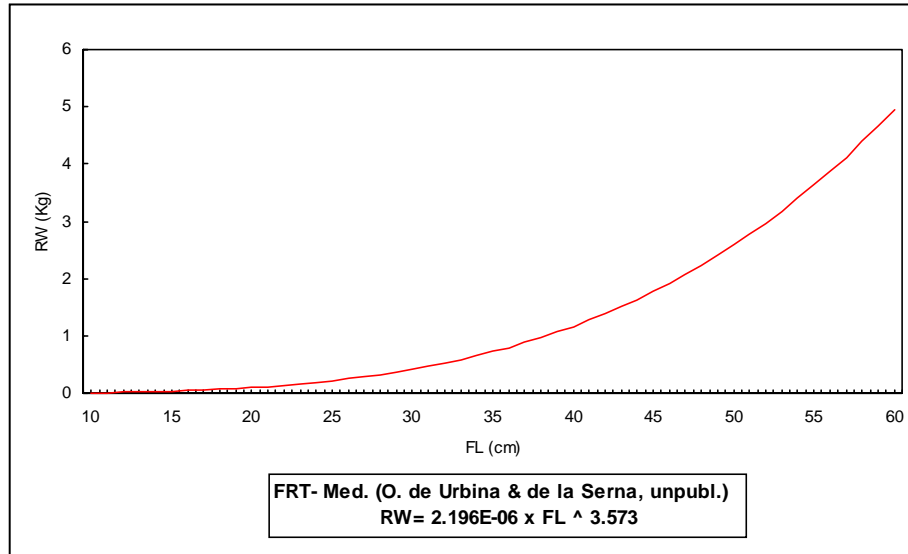


Figure 4.9

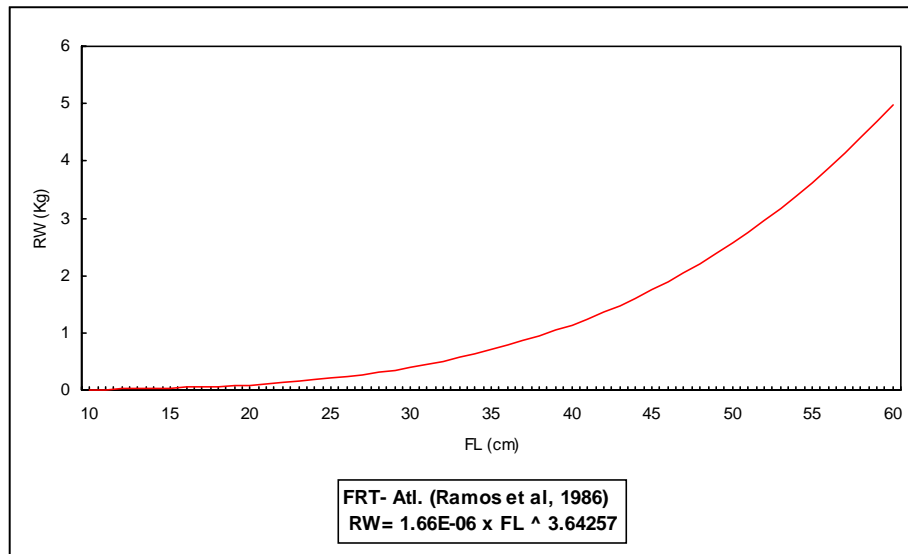


Figure 4.10

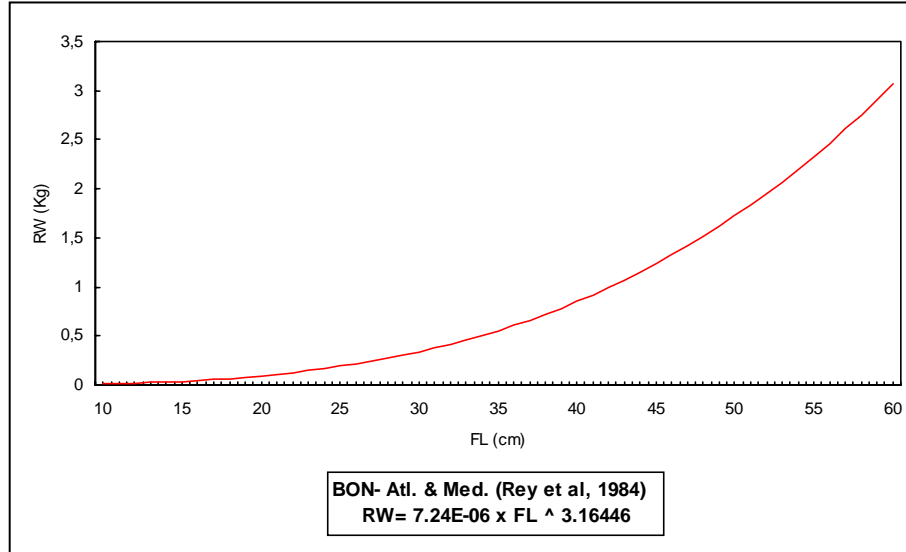


Figure 4.11

TÚNISIA (INSTM)

Objective 4.3b

118 fish were measured and weighted on the trap-net of Sidi Daoud.

Total masses range from 150 to 410 kg.

The relation is calculated as follows :

$$W_{\text{total}} = 15,3 * 10^{-5} [L_5]^{2,6381}$$

Regarding the swordfish, the number of sampled fish is not relevant. In the size-weight relation calculated for this fish, sizes (LJFL) range from 58 to 179 Cm Kg and total masses range from 1.4 to 198 kg.

$$W_{\text{ev}} = 1,798 \cdot 10^{-6} \text{ LJFL}^{3,23142}$$

MALTA (NAC)

Objectif 4.4b

The data was collected as explained in Objective 4 and Table 4.1 indicates the individual lengths and weights of all the tuna landed at the fishmarket during the months of May and June 1999.

Fig. 4.12 gives the length-weight relationship for the year 1999.

LIBYIA (MBRS)

Objective 4.5b

By means of biological sampling of size and weight with sex identification carried out at the tuna traps at Zreg and Musrata, value pairs were obtained for 350 red tuna samples. It has been planned that after completing a large number of samples during the next season, the corresponding size-weight relationship will be developed. The size LF cm was acquired by a calibrator and the weight by a scale of 0.5 kg precision.