EVALUATION OF A NEW FISHING POT TRAP (*LEGE*) IN RIVER RIMA, NORTH WESTERN NIGERIA.

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ABSTRACT

Based on the findings in a diagnostic survey, a new fishing trap, christened Lege trap, was designed and fabricated, and the performance evaluated. The 8-valve Lege trap was assessed concurrently with Malian and Ndurutu traps found to be mostly used by the fishermen in the study area. The experiment was conducted in a randomized complete block design with one factor each replicated three times. Data collected on fish diversity, number, biomass and size were subjected to descriptive statistics and analysis of variance. The results showed that 22 fish species belonging to thirteen families were caught. The prototype (Lege) trap recorded higher species diversity index (0.90) than the Malian (0.50) and Ndurutu (0.50) traps. The Lege trap also accounted for the largest number (55 %) and biomass (63 %) of fish caught which were significantly ($P < 0.05$) higher than those of the Malian and Ndurutu traps. The mean length (15.03 ± 5.70 cm), weight (60.43 ± 48.61 g) and girth (4.77 ± 1.65 cm) of fishes caught in the Lege trap were also significantly ($P < 0.05$) higher than those caught in the other two traps. These results demonstrated better performance of the new trap than the two conventional traps, even though the sizes of some of the fish species caught in all the traps were below those allowed by the Sokoto State Fisheries Edict where the study was conducted. Therefore, since it is desirable to develop conservation oriented trap at a least cost, it is necessary to research further on the number of valves and mesh size of the new trap.

INTRODUCTION

Based on International Standard Statistical Classification of Fishing Gear (ISSCFG), pot traps refers to collection of trap in the form of cages or baskets made with various materials (wood, wicker, metal, rods, wire netting, etc) with one or more openings or entrances, designed to catch fish or crustaceans (Nedelec, 1982). The traps could be used with or without baiting (Everhart *et al.*, 1975). *Malian* and *Ndurutu* are traditional pot traps widely employed by most fishermen in the northern part of Nigeria (Umar, 2001; Umar and Ipinjolu, 2001; Agbelege and Ipinjolu, 2001).

Umar and Ipinjolu (2001) found that the *Malian* and *Ndurutu* traps used by the fishermen along river Rima, in north western Nigeria, trapped juveniles of large size fish species and recommended increases in mesh size of net for *Malian* trap and cane webbings on *Ndurutu* trap. Using participatory approach involving the fishermen, detailed study of the design, materials, costs and operations of these traps were conducted by Ipinjolu *et al.* (2004). The results of the study revealed the advantages and limitations in the design and mode of operation of each trap and recommended areas for improvement. The findings in the study formed the basis for the present research and readers are encouraged to consult the paper for relevant background information.

This study was designed to evolve a new pot fishing trap that could explore the advantages and take care of the limitations of *Malian* and *Ndurutu* traps.

MATERIALS AND METHODS

Study Area

The laboratory aspect of this study was conducted at the Research Laboratory of the Department of Forestry and Fisheries and Sokoto Energy Research Centre of the Usmanu Danfodiyo University, Sokoto. The field trial was conducted in River Rima in Sokoto State in the extreme northwestern part of Nigeria. The climatic conditions in the area and the hydrology of River Rima have earlier been described (SSMIYSC, 2001, Mamman *et al.*, 2001; Ipinjolu *et al.*, 2004).

Malian and *Ndurutu* Traps

The design, materials and operations of *Malian* and *Ndurutu* traps, as wellas their structure, have been described (Ipinjolu *et al.*, 2004). The dimensions of the *Malian* traps used for this experiment are as follows; height 75cm, diameter at the base 45cm, entrance valve diameter 10cm and net mesh size 25.3mm. The *Ndurutu* traps measured 54cm in height, 132 cm in length and 45 cm in width. The Malian traps had 3 entrnace valves each while the Ndurutu had 1entrance valves and 1 inlet valve. The traps were fabricated with the assistance of experienced local fisherman. The *Malian* trap had three inlets valves and each
measured 10cm diameter at the base while the top had loosed hanging nets that could be opened for baiting and removal of fish caught.

Design and Fabrication of the Prototype Pot Trap

The findings from an exploratory survey of *Malian* and *Ndurutu* traps in the study area (Ipinjolu *et al.*, 2004) provided the basic information for the design of the prototype pot trap. The trap was designed to overcome the limitations in the design, materials, costs and operations of the *Malian* and *Ndurutu* traps.(Ipinjolu *et al.*, 2004)

A prototype pot trap was design and fabricated. The frame was flexible iron of 2 mm diameter flexible iron rods of 2 mm diameter, which were cut into specifications and sized with. hark saw. They were folded into shapes and welded together using an electric welding machine. The trap had cane webbings on the top and bottom, 1 inch net mesh size at the sides and 8 non-return valves. The valves comprised of three at the front, two at each side and one between the first and the second chamber. The biggest central valve at the front was 25 cm in diameter while the two at its both sides were 15 cm each. The valves at both sides of the first chamber were 15 cm each while the ones at the sides of the second chamber were 13 cm each. The valve, which separated the first and the second chamber, was 24 cm. The trap was tested for fish catch and other factors in River Rima for a period of 30 days. It was found that the flexible iron frame had more or less collapsed thereby affecting the cane webbings at the top and the entire shape of the trap. Therefore, modifications were made and these included replacement of the metal frame with cane frame and netting of the top. The trap, christened *Lege*, were fabricated using locally sourced materials of the *Ndurutu* and the *Malian* traps. The structure and dimensions of the trap are shown in Figures 1A-F while Plate 1 shows a complete trap. The trap weighed 1.7 Kg. The modified trap was also tested for a period of two weeks after which comparative test with *Malian* and *Ndurutu* traps was conducted.

Experimental Design and Set-up

The experiment was set up in complete randomised block design (CRBD) with one factor (trap type) each replicated three times. Nine traps comprising of three each of the *Malian*, *Ndurutu* and the new (*Lege*) trap were used. All the nine traps were anchored, baited with *bulla* (balls of processed white corn). They were tagged and randomly set at the littoral zone of the river. The traps were re-baited at each time of inspection. They were inspected at alternate days

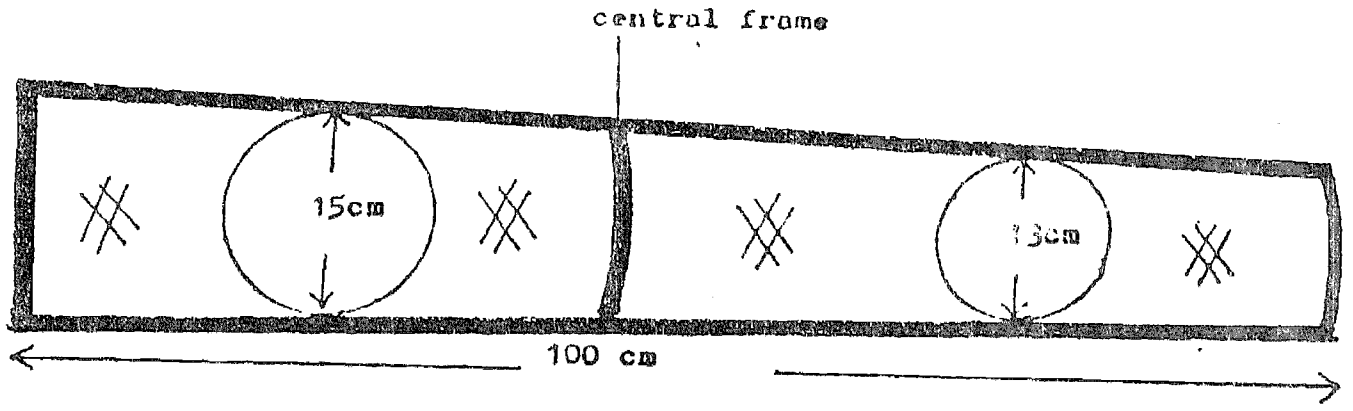


Figure 1 C. Side view of the *Lege* trap

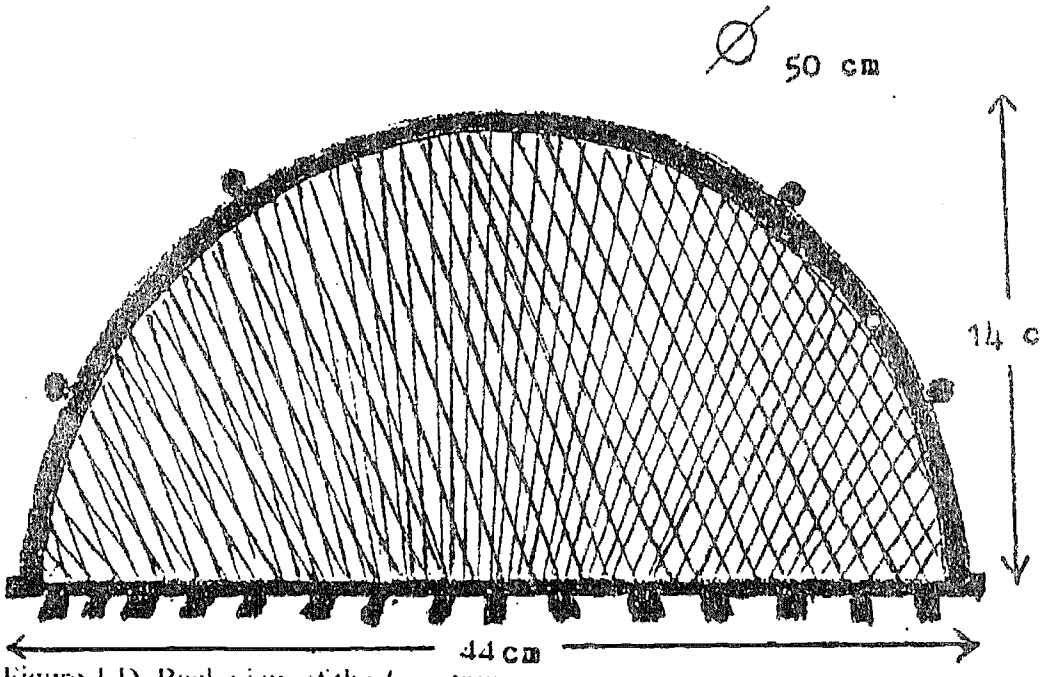
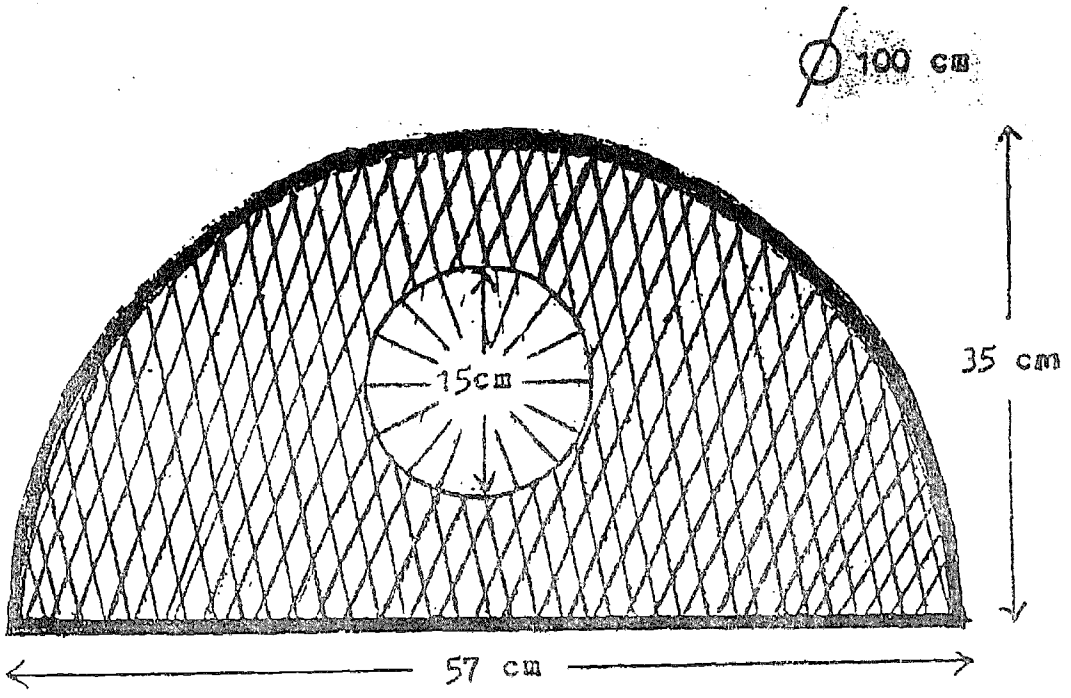


Figure 1 D. Back view of the *Lege* trap



(btween 3.30 pm and 4.00 pm) for catches, cleaning, repairs of damages and rebaiting. The traps were set for 4 weeks.

Data Collection

The traps were inspected for catches on alternate days (between 3.30 pm and 4.00 pm) Fish caught were identified following the descriptions of Reed *et al.* (1967), Holden and Reed (1972) and Olaosebikan and Raji (1998). The number of each species caught was

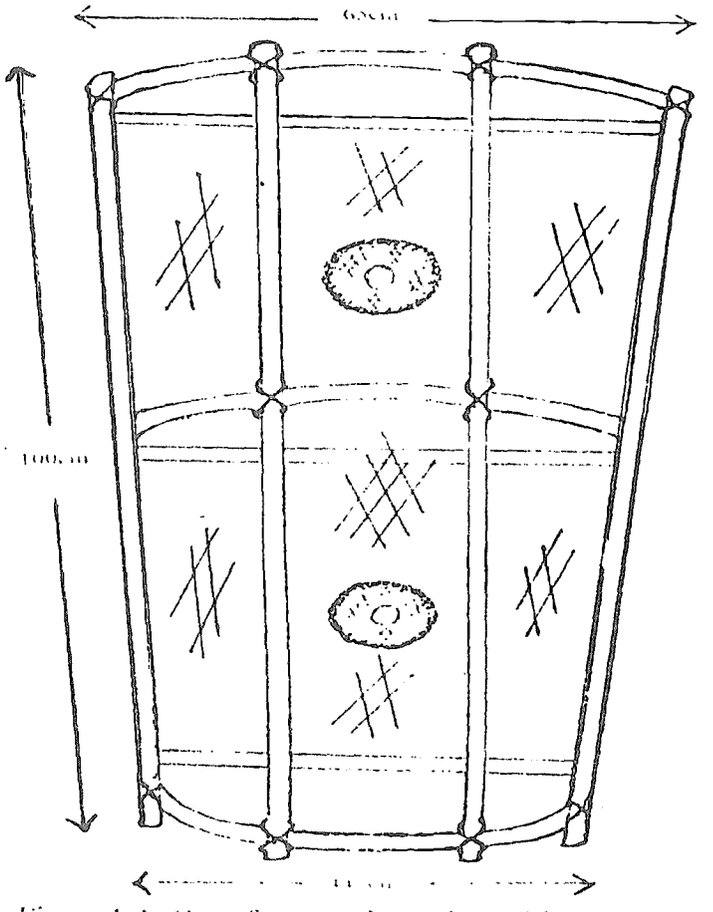


Figure 1 A. Cane frame and top view of the *Lege* trap

Figure 1B. Front view of the *Lege* trap

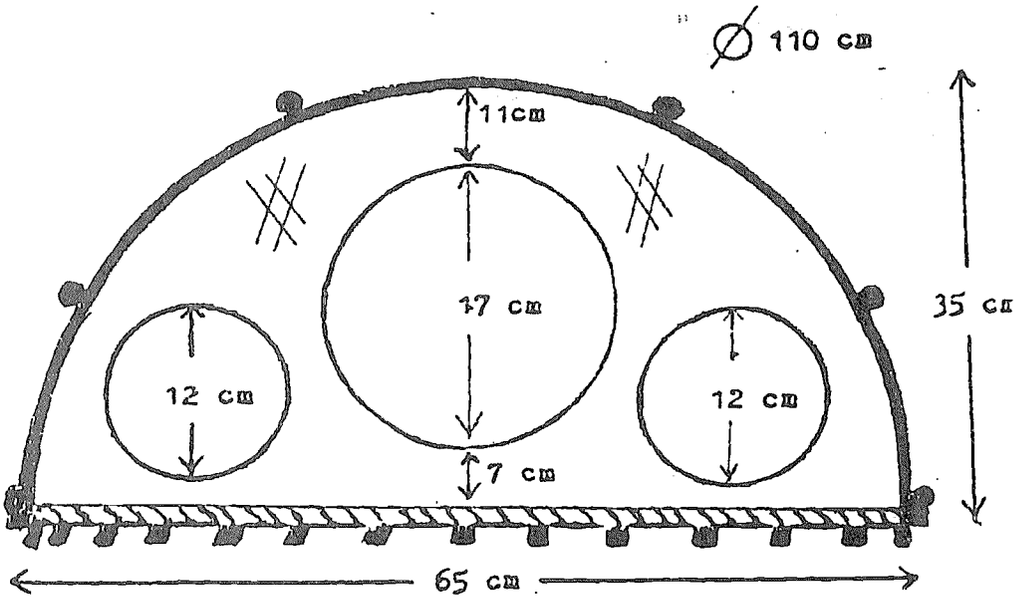


Figure 1 E. Section separating the first and second chambers in *Lege* trap

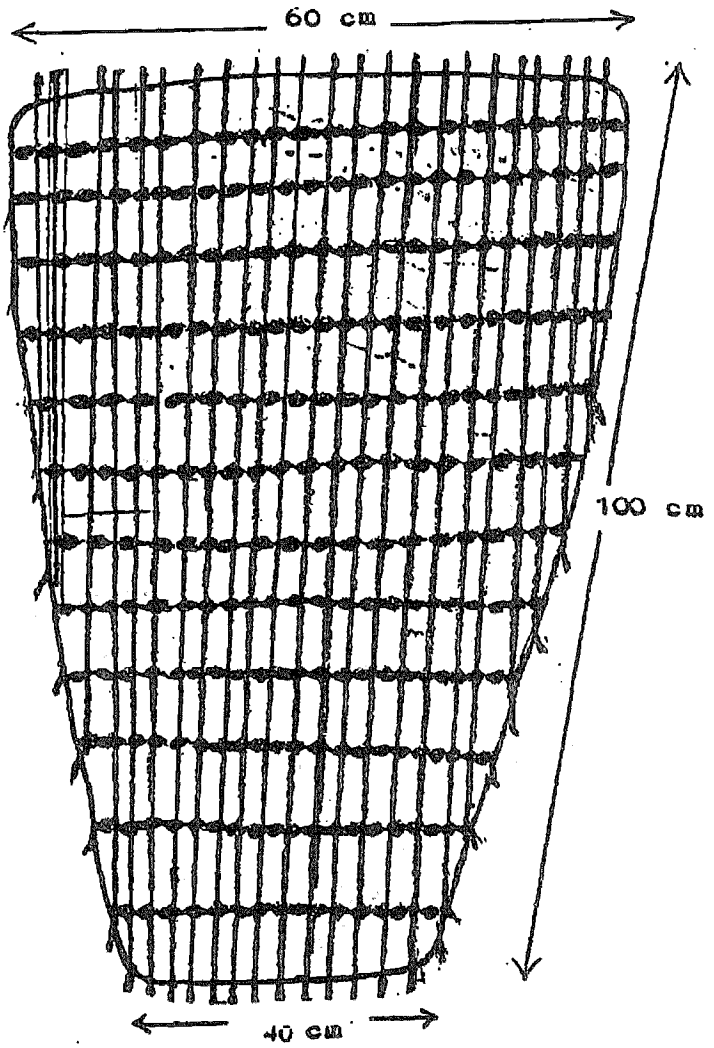


Figure 1 F. Cane mat at the floor of the *Lege* trap

Plate 1: Complete 8-valve *Lege* trap viewed from the top

counted. Total length (cm) of each fish was measured on a graduated measuring board while the total weight (g) was obtained using a hand held Spring balance of 1 kg capacity

Data Analysis

Species Diversity Index (SDI) was calculated using the formula

$$SDI = \frac{No\ of\ species\ caught\ by\ each\ trap\ type}{Total\ No\ of\ species\ caught\ by\ all\ the\ traps}$$

The data collected on fish number, biomass and size were subjected to descriptive statisitical analysis and analysis of variance (ANOVA) (Steel and Torrie, 1980) using the Statistical Package for the Social Sciences (SPSS, 1999). Mean values were separated using Duncan Multiple Range Test, and test of significance was at 95% probability. Fish species with numbers less than five were not included in the statistical analsysis.

RESULTS

Species Composition

The various types of fish caught by the *Malian*, *Ndurutu* and the Prototype (*Lege*) traps are presented in Table 1. A total of 22 species belonging to 13 families was recorded. The Mormyridae and Mochokidae were each represented by five species while the Cichlidae was represented by two species. The other twelve families were each represented by one species.

Out of the total species recorded, 95.45 % was caught in the prototype trap, with a species diversity index (SDI) of 0.90. The *Malian* and the *Ndurutu* traps caught twelve species each with a diversity index of 0.50 each. In the *Lege* trap, six species belonging to six families were caught which were not recorded in the *Malian* and *Ndurutu* traps. *M. deliciosus* was caught only in the *Malian* trap.

Table 1 : Compositions of fish caught in *Malian*, *Ndurutu* and the *Lege* trap

Family	Species	Trap		
		Mali	Nduru	Le
Clariidae	*Clarias gariepinus*	X	X	X
Mormyridae	*Marcusenius isidori*	X	-	X
	Hyperopisus bebe	X	X	X
	Mormyrus rume	X	X	X
	Mormyrus hasselquisti	-	-	X
	Mormyrops deliciosus	X	-	

Mochokidae	*Synodontis eupterus*	X	X	X
	Synodontis clarias	X	X	X
	Synodontis sorex	X	X	X
	Synodontis gobroni	-	X	X
	Mochocus niloticus	X	-	X
Bagridae	*Auchenoglanis occidentalis*	-	-	X
Malapteruridae	*Malapterurus electricus*	X	-	X
Cichlidae	*Oreochromis niloticus*	X	X	X
	Sarotherodon galilaeus	X	X	X
Citharinidae	*Citharinus brevipinis*	-	X	X
Centropomidae	*Lates niloticus*	-	-	X
Characidae	*Alestes baremoze*	-	X	X
Distichodontidae	*Distichodus rostratus*	-	-	X
Protopteridae	*Protopterus annectens*	-	-	X
Schilbeidae	*Schilbe mystus*	-	X	X
Cyprinidae	*Labeo coubie*	-	-	X
Total Species	22	12	12	21
Diversity Index		0.5	0.5	0.9

Number and Biomass of Fish Caught

The numbers and biomass of the various species caught in the traps are contained in Table 2. A total of 635 fish was caught, of which 21% and 24% were recorded in the *Malian* and *Ndurutu* traps, respectively, while 55% was caught in the *Lege* trap. Similarly, a total of 34 67 kg of fish was caught, of which 16, 21 and 63% were caught in the *Malian*, *Ndurutu* and *Lege* traps, respectively.

The number and biomass of fish caught in the prototype *Lege* trap was significantly ($P < 0.05$) higher than those caught in the other two traps (Table3).

However, the numbers

Table 2. Number and biomass (g) of fish caught in *Malian*, *Ndumbi* and *Lege* traps

Species	Traps											
	Malian				*Ndumbi*				Prototype (*Legs*)			
	No.	%	Biomass	%	No.	%	Biomass	%	No	%	Biomass	%
C. gariepinus	5	3.68	400.7	7.28	9	5.96	767.0	10.42	13	3.74	3060.3	9.45
M. isidori	3	2.21	17.0	0.31					6	1.72	75.8	0.35
H. bebe	2	1.47	87.0	1.58	1	0.66	60.4	0.82	10	2.87	1589.4	7.25
M. tumie	1	0.73	120.0	2.18	3	1.99	246.0	3.34	7	2.10	951.7	4.36
M. hasselquisti									2	0.57	199.0	0.91
M. deliciosus	1	0.73	105.0	1.91								
S. cupleros	62	45.60	2072.7	37.65	53	35.10	1884.9	25.60	126	36.21	4584.6	21.02
S. dageti	45	33.10	1563.0	28.39	59	39.10	2400.7	32.61	95	27.30	3928.6	18.02
S. sorex	2	1.47	125.0	2.27	2	1.32	160.0	2.17	11	3.16	1045.2	4.79
S. gobroni					3	1.99	271.0	3.68	5	1.44	540.7	2.48
M. niloticus	2	1.47	82.0	1.49					6	1.72	201.3	0.93
A. occidentalis									1	0.29	240.0	1.10
M. electricus	5	3.68	450.0	8.17					11	3.16	1116.7	5.26
O. niloticus	4	2.94	310.0	5.63	14	9.27	1205.2	16.37	33	9.48	3726.0	17.09
S. galilaeus	1	0.73	105.0	1.91	3	1.99	190.0	2.58	3	0.86	615.0	2.82
C. brevipinis					1	0.66	72.0	0.98	1	0.29	130.7	0.60
L. niloticus									1	0.29	65.0	0.30
A. baremoze					2	1.32	80.0	1.10	8	2.30	338.0	1.55
D. rostratus									1	0.29	150.0	0.69
P. annectens									2	0.57	86.0	0.39
S. mystus	3	2.21	68.0		1	0.66	25.0	0.34	5	1.44	133.0	0.61

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				1 23									
L. coubie										1	0.29	8.0	0.01
Total	136	100	5605.4	100	151	100	7362.2	100	348	100	21896	100	
%		21.42						21.23		54.80			
				15.88		23.78							62.89

Table 3 : Results of analysis of variance of the number and biomass of fish caught

Trap	No.of fish	Biomass (kg)
Malian	136[b]	40.63[b]
Ndurutu	151[b]	48.46[b]
Lege	348[a]	62.64[a]
Overall	635	151.73

and biomass of fish caught in the *Malian* and *Ndurutu* traps were not significantly different ($P > 0.05$).

Size of Fish Caught

Length

The length distribution of the fish species caught (Table 4) shows that the smallest (*M. isidori*) and the biggest (*C. gariepinus*) sizes were caught in the *Lege* traps. Comparison of the sizes of the other species caught in the *Malian* and *Ndurutu* with those of the *Lege* trap also indicate that most of the biggest sizes were caught in the latter trap.

The results of the analysis of variance (Table7) showed that the mean length of all fish species caught in the *Malian* trap (11.71 ± 1.97 cm) was not significantly ($P > 0.05$) different from those caught in the *Ndurutu* (12.64 ± 2.80 cm). However, the mean length of all fish caught in the *Lege* trap (15.03 ± 5.70 cm) was significantly higher ($P < 0.05$) than the mean lengths of fish caught in the *Malian* and *Ndurutu* traps (Table 7).

Weight

The weight of individual fish caught in the traps (Table 5) revealed that large sizes were caught in *Lege* traps. The mean weight of fish caught in the traps (Table 7) showed higher value for *Lege* trap (60.43 ± 48.6 g), which was significantly ($P<0.05$) different from the mean weight of fish caught in the other traps (Table 7). On the other

Table 4. Lengths (cm) of fish caught in *Malian*, *Ndurutu* and *Lege* traps

	Malian				*Ndurutu*				*Lege*		
Species	No.	Min.	Max.	Mean ± SD	No.	Min.	Max.	Mean ±SD	No.	Min.	Max.
C. gariepinus	5	11.00	17.50	15.20 ±0.61	9	12.0	34.00	16.87 ±7.16	13	10.00	45.00
M. isidori									6	6.00	14.50
H.b.occidentalis									10	20.00	34.00
M. rume									7	21.00	33.60
S. eupterus	62	9.00	13.00	10.91 ±1.24	53	9.00	13.60	11.59 ±1.12	126	9.00	15.20
S. clarias	45	9.00	14.00	11.75 ±0.85	59	9.00	14.20	12.11 ±1.25	95	9.00	17.00
S. sorex									11	14.00	33.00
S. gobroni									5	20.00	24 00
M. iloticus									6	13.00	18.50
M. electricus	5	16.00	20.00	17.80±1.79					11	18.00	28.00
O. niloticus					14	13.5	21.00	16.14 ±2.38	33	9.00	24.00
S. galilaeus											
A. baremoze									8	14.30	18.00
S. mystus									5	13.50	15.80
Total	117	9.00	20.00	11.71±1.97	135	9.00	34.00	12.64 ±2.80	336	6.00	45.00

Table 5

Table 5. Weights (g) of fish caught in *Malian*, *Ndurutu* and *Lege* traps

	Malian				*Ndurutu*				*Lege*		
Species	No.	Min	Max.	Mean ± SD	No.	Min.	Max.	Mean± SD	No.	Min.	Max.
C.*gariepi-Nus*	5	45	127.60	83.14±33.42	9	45	241.0	85.22±60.49	13	42.00	400.00
M. isidori									6	8.80	30.00
H.bebe occidentali									10	101.00	240.00
M. rume									7	82.70	235.00
S. eupterus	62	20	51.40	33.43±9.76	53	20	52.0	35.56± 9.74	126	20.00	55.10
S. clarias	45	20	52	34.84±10.02	59	20	51.4	40.69± 8.31	95	18.00	55.30
S. sorex									11	30.00	135.00
S. gobroni									5	100.00	120.70
M. niloticus									6	21.00	49 30
M. electricus	5	75	110	90.00±13.69					11	80.00	201.00
O. niloticus					14	50	104	82.87±17.86	33	48.00	220.00
S. galilaeus											
A. baremoze									8	30.00	52.00
S. mystus									5	25.00	30.00
Total	117	20	127.60	38.52±18.77	135	20.0	241.0	46.02±24.84	336	8.80	400.00

hand, the mean weight of fish caught in the *Malian* trap (38.52 ± 18.77g) was not significantly different (P > 0.05) from that of the *Ndurutu* trap (46.02 ± 24.84 g).

Girth Size

Comparison of the girth sizes of the fish species caught in *Malian*, *Ndurutu* and the *Lege* trap (Table 6) indicate highest girth lengths for fish caught in the latter trap. The results of the analysis of variance (Table 7) also showed that the overall mean girth length of all fish caught in the *Lege* trap (4.77 ± 1.65 cm) was significantly higher ($p < 0.05$) than those caught in the *Malian* and *Ndurutu* traps (Table 7).

Costs of the Traps

Table 8 shows the costs of the materials used for the fabrication of the *Lege*, *Malian* and *Ndurutu* traps. The total cost of construction of the new pot trap was N775.00, of which labour accounted for the highest (38.7%) ammount followed by the nylon netting material that accounted for about 65.8%. The major material, which accounted for the highest percentage (49.5 %) of the total cost of *Malian* trap, was the nylon netting while labour ccounted for about 35.4 %. The cane sticks used for the frame of the trap accounted for only about 8%. In the case of *Ndurutu*, only two materials were locally sourced with total cost of N290.00, both accounting for about 65.9% of the total cost of the trap while labour accounted for about 34.1%.

Table 6. Girth sizes (cm) of fish caught in *Malian*, *Ndurutu* and *Lege* traps

Species	Malian				Ndurutu				Lege			
	No.	Min.	Max.	Mean±SD	No.	Min.	Max.	Mean± SD	No.	Min.	Max.	M
C.gariepinus	5	3.00	7.50	4.58±1.81	9	3.00	5.00	3.59±0.64	13	2.30	7.00	4
M. isidori									6	2.50	4.50	2
H.b.occidentalis									10	3.00	9.00	6
M. rume									7	5.00	9.80	6
S. eupterus	62	3.00	5.50	3.90±0.68	53	2.50	5.50	3.90±0.75	126	2.00	5.50	3
S. clarias	45	2.50	5.20	3.71±0.66	59	2.50	5.00	4.13±0.63	95	2.50	5.50	4
S. sorex									11	4.00	10.50	7
S. gobroni									5	7.00	9.00	7
M. niloticus									6	3.50	4.60	4
M. electricus	5	3.50	4.00	3.66±0.23					11	3.50	8.00	4
O. niloticus					14	5.00	7.00	5.49±0.60	33	4.00	9.80	7
S. galilaeus												
A. baremoze									8	4.00	5.20	4
S. mystus									5	3.50	3.50	
Total	117	2.50	7.50	3.85±0.75	135	2.50	7.00	4.15±0.83	336	2.00	10.50	4

Table 7. Mean length, weight and girth of fish caught in *Malian*, *Ndurutu* and *Lege* traps

Trap	Length (cm)				Weight (g)			Girth (cm)		
	No.	Min.	Max.	Mean ± SD	Min.	Max.	Mean±SD	Min	Max	Mean ± SD
Malian	136	4.00	24.00	12.02± 3.00^{c}	4.00	127.60	40.63 ±22.78^{b}	1.00	8.00	3.94 ± 1.11^{c}
Ndurutu	151	9.00	34.00	13.08± 3.11^{b}	20.00	241.00	40.46 ± 25.40^{b}	2.50	7.20	4.28 ± 0.95^{b}
Lege	348	4.00	45.00	15.21± 5.75^{a}	8.00	400.00	62.64 ± 51.47^{a}	1.20	15.00	4.87 ± 1.83^{a}
Overall	635	4.00	45.00	14.02± 4.91	4.00	400.00	54.55 ± 42.42	1.00	15.00	4.53 ± 1.57

Means in the same column with same letter are not significantly different (P > 0.05)

Table 8 Cost of construction of the *Lege*, *Malian* and *Ndurutu*

Trap / Item	Quantity/Dimension	Unit Price (₦)	Cost (₦)	Perce-ntage
New (Lege)				
Cane sticks	1 bundle	45.00	45.00	5.81
1" (25.3mm) mesh net	1.14 m	175.00	200.00	25.81
Twine (210D/9)	5 m	0.20	10.00	1.29
Webbing cane mat	100 cm x 45 cm (1)	100.00	100.00	12.90
Non-Return Valves (small)	7 (12 – 15 cm)	10.00	70.00	9.03
Non-Return Valves (big)	1 (17 cm)	50.00	50.00	6.45
Labour			300.00	38.71
Total			775.00	100.00
Ndurutu				
Webbing cane mat	2 (137 cm x 115 cm)	100.00	200.00	45.45
Strips of Liana	3 bundles	30.00	90.00	20.45
Labour			150.00	34.09
Total			440.00	100.00
Malian				
Cane sticks	1 bundle	45.00	45.00	7.96
1" (25.3mm) mesh net	1.60 m	175.00	280.00	49.56
Non Return valves	3 (12 cm)	10.00	30.00	5.31
Twine 210D/12	5 m	0.20	10.00	1.77
Labour			200.00	35.40
Total			565.00	100.00

DISCUSSION

The *Lege* trap has been designed to overcome most of the limitations of the *Malian* and *Ndurutu* traps. The trap could be set with absolute immersion in the water body, unlike Malian trap that is set with the top projecting out of water, to reduce possibility of stealing the catches or the traps. The elongated dome shape of the *Lege* trap could also allow its usage in deeper waters if it is well anchored with retrieving rope. Further, each chamber of the trap was provided with one opening at the top for easy baiting and collection of catches, unlike in the case of *Ndurutu* trap that has to be loosened at one end before fish caught could be removed. The numbers of non-return valves have been increased to enhance more catches and this could improve the catch per unit effort while the large front central valve could enhance trapping of large size fishes. The trap can as well be used for collection of healthy brood stocks, fingerlings and ornamental fish species from the wild and thus could be useful for research purposes.

The diverse species recorded in the three trpas indicate their effectiveness in trapping various types of species that are of different shapes, occupy different food nitches and exhibit different behavioural characteristics (Reed *et al*., 1967 ; Holden and Reed, 1972). However, the higher species diversity index of the new (*Lege*) trap indicate superiority over the *Malian* and *Ndurutu* traps. The types and numbers of species recorded in the river are only indicative of the fish diversity since fishing gears, traps inclusive, are known to be species, size and sex selective (Lagler, 1978), coupled with the fact that this study was conducted over a short period during the flood season. This study was conducted during the rainy months of July/August when River Rima waters were flooded. Therefore, the dominance of Mochokidae species (*S. eupterus* and *S.*

clarias) in the catches of the three traps is most probably indicative of the seasonal abundance (Reed *et al.*, 1967).

The higher ($P < 0.05$) number and biomass of fish recorded in the *Lege* trap than the other two traps could be attributed to it's higher number and positions of the external non-return entrance valves. Also, the relatively wide (17 cm) central front valve could have conferred advantage in trapping more fishes with different body shapes and configuration. The *Malian* and *Ndurutu* traps had only three and one external valves, respectively.

The length, weight and girth length of the fishes caught showed that the three traps were capable of trapping small size fishes as well as juveniles of large size commercial species. This was due to the small mesh size of the net on the *Malian* and *Lege traps* and sclose cane webbings on the *Ndurutu* traps. Ealier investigation revealed that *Malian* and *Ndurutu* traps exploited juvenile fishes (Umar and Ipinjolu, 2001) as equally complained by the fishermen (Ipinjolu *et al*,. 2004). However, the *Lege* trap showed better potential for catching large size fishes than the other two traps (Table 7). The *Lege* trap is still in the process of development, and the decision at this preliminary stage to use net of the same mesh size being used by the fisheremen was to provide the required scientific basis for comparison with the other two traps. Subsequent research will address other issues including mesh size.

This study was also intended to produce a trap at possible least cost using durable and cheaper materials.The new trap was fabricated at a cost of N775.00 while the *Ndurutu* and *Malian* traps cost ed N440.00 and N565.00, respectively. Where the traps are self constructed, the total costs could be by 38.71 % 34.1 % and 35.4 % for the *Lege*, *Ndurutu* and *Malian* traps, respectively, that is the labour costs. The open market prices of *Malian* and *Ndurutu* traps N600.00 and N500.00, respectively. Therefore, the cost of constructing the new trap would just be slightly higher than the costs of the other two traps due mainly to labour. However, the better performance of the *Lege* trap in terms of the diversity and quantity fish caught, and it's durability, are other issues to be considered in assessing it's relative cost.

CONCLUSION

The new (*Lege*) trap could avoid most of the limitations associated with the design and operations of *Malian* and. *Ndurutu* traps. The trap has also proved to me more efficient than the other two traps based on the results of the species diversity index and the number, biomass and sizes of fish caught. However, the trap is still in development process and further research is required to determine the most appropriate number and size of valves and the opmimum mesh size of the net.

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