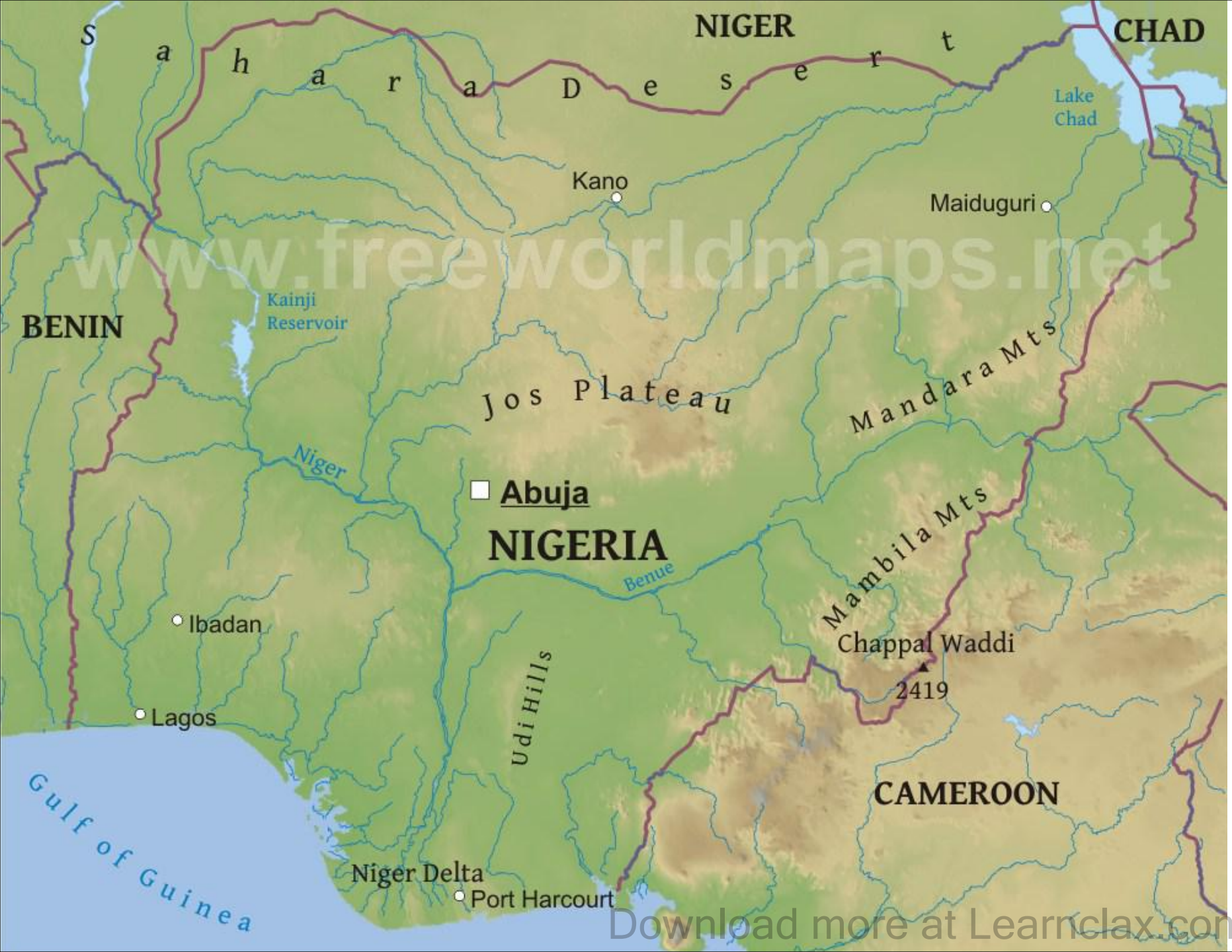
ZLY 314 – NIGERIAN FISHERIES

- 11/55EK108 IGBEKELE, Olarinde Sunday
- 11/55EK052 AKINSANMI, Oluwaseun Samuel
- 09/30GB059 ODUWOLE, Akinwunmi Abbey
- 11/55EK151 OLAYINKA, Tolulope Oluwapelumi
- 0946KA042

Evolution of Nigerian Fisheries

- 1940 - A formal fisheries service was established in Nigeria by the British Colonial Government
- Later, the department was split into two
  1. Federal Department of Fisheries (FDF) with responsibility for development activities
  2. Nigerian Institute for Oceanography and Marine Research, (NIOMR) for marine fisheries research.
- 1975 - Federal Military Government created 22 Research Institutes including two new fisheries Institutes
  1. Maiduguri –Lake Chad Research Institute
  2. New Bussa
     - Kainji Lake Research Institute
     - National Institute for Freshwater Fisheries Research (NIFFR).


Sahara Desert
NIGER
CHAD
Lake Chad
Kano
Maiduguri
www.freeworldmaps.net
BENIN
Kainji Reservoir
Jos Plateau
Mandara Mts
Niger
Abuja
NIGERIA
Benue
Mambila Mts
Ibadan
Chappal Waddi
2419
Udi Hills
Lagos
CAMEROON
Gulf of Guinea
Niger Delta
Port Harcourt
Download more at Learnclax.com

The hydrology of Nigeria

- Two great river systems
  - Niger-Benue System & Chad systems
- few rivers that empty directly into the Atlantic Ocean
  - Cross River / Ogun / OshuN / Imo / Qua Iboe
- Total rainfall decreases from the coast northwards
  - The South - 1,500 and 4,000 mm
  - The North - 500 and 1000 mm.

WATER RESOURCES

- Nigeria - land area 94,185,000 hectares
- Freshwater inland water bodies (reservoirs, lakes, rivers, ponds and perennial swarms) - 12,478,818 hectares
- 8 Major rivers - 11.5% of the total surface area
- 13 major lakes and reservoirs (4000 - 550,000 ha)
  - 1% of the total land area
- Saline water - 858,000 ha
  - Deltas and Estuaries
  - saline wetlands
- wetlands suitable for rice - 15.9% of the total area

Mangrove ecosystem

- The country has an extensive mangrove ecosystem
- Niger Delta, Cross River,
- estimated area 500,000 and 885,000 ha.
- Freshwaters start at the northern limit of the mangrove ecosystems and extend to the Sahelian region.

Fish species

- 230 fish species have been recorded from the rivers of Nigeria.
- In all some 196 species belonging to 105 genera representing 46 families have been recovered in the freshwater sector (Leveque et al., 1991).
- Kainji Lake -101 specie
- Jebba Lake - 52 species

Freshwater Fish

- Commercially important freshwater fish families in Nigerian waters
  a) Mormyridae (43 Sp.)
  b) Cyprinidae (32)
  c) Mochokidae (27)
  d) Characidae (25)
  e) Cichlidae (19)
- However, the catfishes appear to be more commercially important.

Small-scale fisheries

- Labour-intensive fisheries
- using relatively small crafts (if any) and little capital and equipment per person-on-board.
- Most often family-owned.
- May be commercial or for subsistence
- Usually low fuel consumption.
- Often equated with artisanal fisheries.

Industrial fisheries

- Capital-intensive fisheries
- using relatively large vessels with a high degree of mechanization
- have advanced fish finding and navigational equipment
- Such fisheries have a high production capacity and the catch per unit effort is normally relatively high

Artisanal fisheries

- referred to as small-scale fisheries
- Typically traditional fisheries involving fishing for household use
- using relatively small amount of capital
- relatively small fishing vessels
- making short fishing trips
- close to shore
- mainly for local consumption
- from hand-collection on the beach
- one-person canoe in poor developing countries, to more than 20 men
- trawlers, seiners, or long-liners over 20m in developed countries
- subsistence or commercial
- low level technology

Freshwater fishermen

- three categories of fishermen in Nigeria
  - occasional fishermen
  - part-time fishermen
  - full-time fishermen

OCCASIONAL FISHERMEN

- individual time spent is low
- gear is simple and relatively unproductive
- fished from the bank or by wading in floodplain waters
- floodplain communities fish for subsistence
- between the sowing and the harvest
- certain depression lakes or sectors of the river and floodplain are reserved for the inhabitants of particular villages
- Fishing festivals
- Most of the fish caught enters directly into the diet of the fishing community.

PART-TIME FISHERMEN

- people living on floodplains fish during part of the year
- co-equal to or inferior to the alternative activities
- cyclic patternof fishing
  - flood cycle
    - during the floods there is very little fishing
    - when water drain from the plain, fishing increases
    - as the floodplain dries the preparation of the soil and sowing of the seeds take priority
    - to be followed with a second burst of fishing at low water.
  - biological cycle of the fish
  - seasonal needs of agriculture impose a communities
- use most types of gear

PROFESSIONAL FISHERMEN

- groups of individuals that live entirely by fishing
- year round employment
- Nomadic life
- Migratory fishermen is a feature of river fisheries - 1 000 km.
- Haoussa fisher men in Niger river –
  - 20–30 persons who moved upstream in September and October to fish the northerly portions of the Central Delta on the falling flood.
- The main vessels - up to 15 m long and were equipped to support whole families on the journey
- Flotilla - small craft which were used in the actual fishing.

PROFESSIONAL FISHERMEN

- On the return journey, which was made on the next flood, the main vessels were loaded with many tons of fish for sale in the Nigerian markets
- Professional fishermen use a vast range of fishing gear
- in recent years concentrated on one or two of the fishing methods based on modern materials such as seine nets, gillnets or cast nets.
- use powered craft to a great extent

Fishing seasons

- Intensive fishing continues throughout the dry season in
  - standing waters of the floodplain
  - main river channel
- Fish become more available for capture as they congregate in the channels and pools of the floodplain during drying
- Later as the water begins to rise again fairly specialized fisheries concentrate on the adult fish migrating to their breeding sites.

CAPTURE METHODS

- Fish capture methods depends on
  - habitat,
  - diet,
  - migration pattern
  - ease of capture
- Mainly juvenile fish are caught
- Establishment of rules with respect to which species and age classes they attempt to capture.
- Preference is often imposed by local food taboos or customs

Fishing gear

- Clapnets
  - during the dry season when the water level is low
- Hook and line
  - both dry and flood season along the shallow littoral margins of the lakes or floodplain.
- Long lines - Lingo
  - unbaited with closely arranged 100 hooks (Nos 7 to 16) (Mari Mari)
  - baited with small fish, preferably alive, in order to attract large carnivores.
  - all year round

Fishing gear

- Cast-nets - Brigi
  - about 3 – 4 metres long with a spread circumference of 15 – 20 metres.
  - The netting is made of nylon with small mesh sizes of between 38mm and 51mm
  - small lakes and reservoirs.
- Gear combinations
  - combine loglines with gillnets

SPECIES CAUGHT

- Distributions of this type predict that only a few species will be dominant in the catch of any gear, and a knowledge of these is essential, both for the management of the stocks and for establishing priorities for research.
- On the basis of these experimental fishings it appeared that the ten most important species to the fishery were
- *Schilbe mystus*
- *Lates niloticus*
- *Alestes dentex*
- *A. baremoze*
- *Hydrocynus brevis*
- *Labeo senegalensis*
- *Eutropius niloticus*
- *Citharinus citharus*
- *Heterotis niloticus*
- *Hepsetus odoe*

Predominant species in the Oueme system

- There are about 40 species in the catch
- Most favored are
  - *Clarias ebriensis*
  - *Synodontis melanopterus*
  - *Clarias lazera*
  - *Synodontis schall*
  - *Parachanna obscurus*
  - *Schilbe mystus*
  - *Heterotis niloticus*
  - *Distichodus rostratus*
  - *Mormyrids*
  - *Ctenopoma kingsleyae*

Predominant species in the Central Delta of the Niger

- *Alestes dentex*
- *Lates niloticus*
- *Brachysynodontis batensoda*
- *Bagrus bayad*
- *Hydrocynus forskhalii*
- *Mormyrus rume*
- *Oreochromis niloticus*
- *Citharinus latus*
- *Labeo senegalensis*
- *Auchenoglanis occidentalis*
- *Clarias anguillaris*
- *Brycinus leuciscus*

FISHERIES FOR JUVENILE FISH

- The very heavy exploitation of juvenile fish, in the form of **fish of the year moving to the dry season habitats** at the end of the flood, is a particular feature of floodplain fisheries.
- In the Oueme, small mesh nets of various types are used intensively in the canals draining the plain.
- Cross channel dams and barrages, such as those of the El Beid or the Barotse plain are also designed for the capture of young fish.
- Durand (1970) estimated that up to 90% of the catch by number and weight of the El Beid river was made up of juvenile fish moving from the Yaeres floodplain towards Lake Chad.
- The “maalelo” fishery of the Barotse removed about 3.7 percent of the juveniles of the 15 most important species each year (Bell-Cross, 1971).

Ichthyotoxic plants used in fishing in Benue River

Plant	Active part	Effect
Balanites aegyptica	Bark which is crushed	Kills fish within a few hours
Tephrosia vogelii	Leaves and young shoots crushed	Fish appear on surface very quickly and die soon after
Momordica charantia	Dried leaves and fruits: usually mixed with Balanites	Effect very slow
Unidentified plant: (local name: Horesoungsoungko)	Whole plant used after crush- ing in a mortar. The shallow lagoon to be fished is stirred up and the poison mixes with the mud	Especially effective for catch- ing bottom living mud-eating species such as Clarias
Crinum sp.	Bulbs crushed in a mortar and put in a sack which is drawn through the water	Very effective, kills all fish in a short time
Indigofera pilosa	Ripe seeds	Useful in waters of little volume but is more often mixed with other products
Parkia filicoidea	Pre-ripe seeds pulped	Slow in action and ineffective against siluroids

Traditional bans

- To control the fishing in larger floodplain lakes taboos are operating
- traditional bans have arisen from the recognition of the flood season as a period of breeding
- There are traditional mechanisms for regulating the fishery including
  - closed seasons
  - delimitation of refuge areas
  - limitation on access to the fishery

Small Reservoirs and Natural Lakes

- Fishing is a year-round activity
- highest intensity of operation occurring during the dry season (i.e. November to April)
- Fishing effort is usually reduced during the rainy season when fishing operations have to be combined with farming.

PROTECTION AGAINST INSECT INFESTATION

- Blowfly larvae
  - consumes the fish flesh
  - only when the fish is sufficiently dried that it becomes unattractive to the adult fly for egg laying
- *Dermestes* spp
  - Dried or smoked fish
  - Attacked by beetles
  - The level of losses directly related to the length of storage of the fish
  - Prevention - re-heating or re-smoking of the infested fish in a temperature above 50°.
  - The use of insecticides is not advisable

(a) Total inland capture production (thousand tonnes)

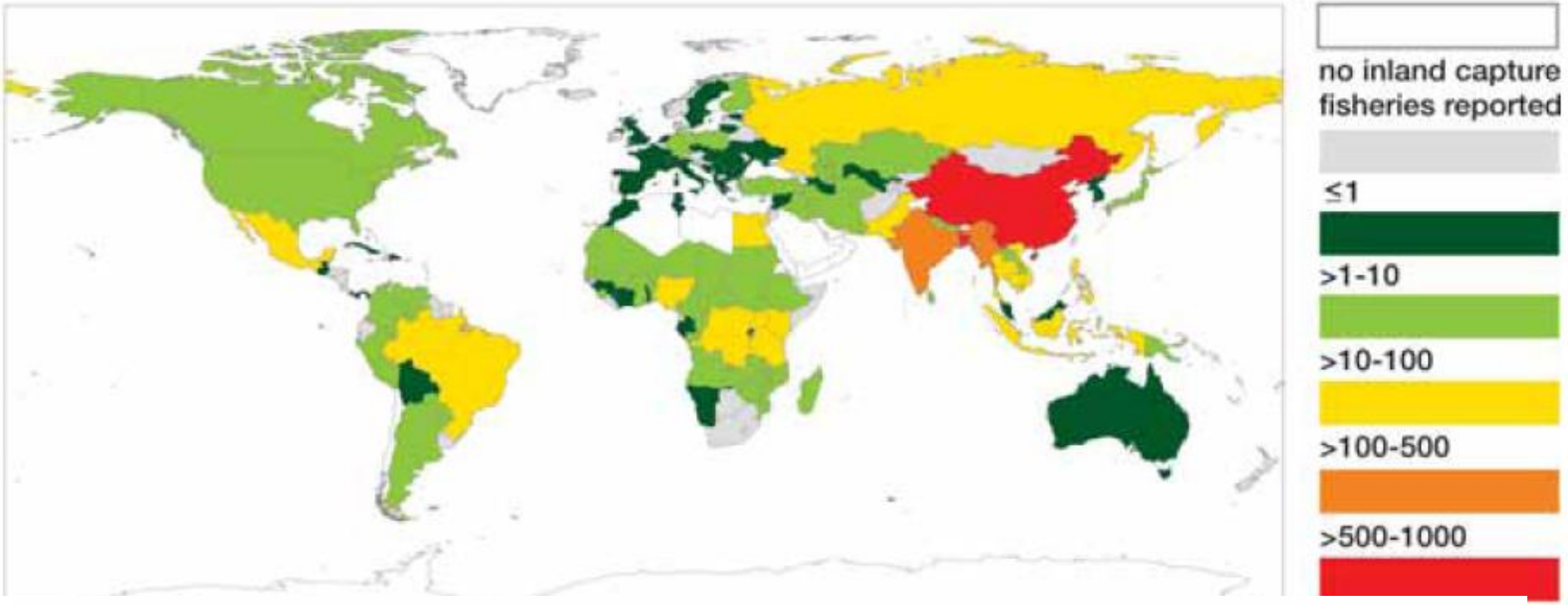


Figure 5. ***(a) Annual harvest from inland fisheries; (b) Proportion of total catch from wild fisheries that comes from inland systems; (c) Inland capture production per capita*** *(data from FishStat plus, 2010).*

(b) Inland capture production as a proportion of total capture (%)

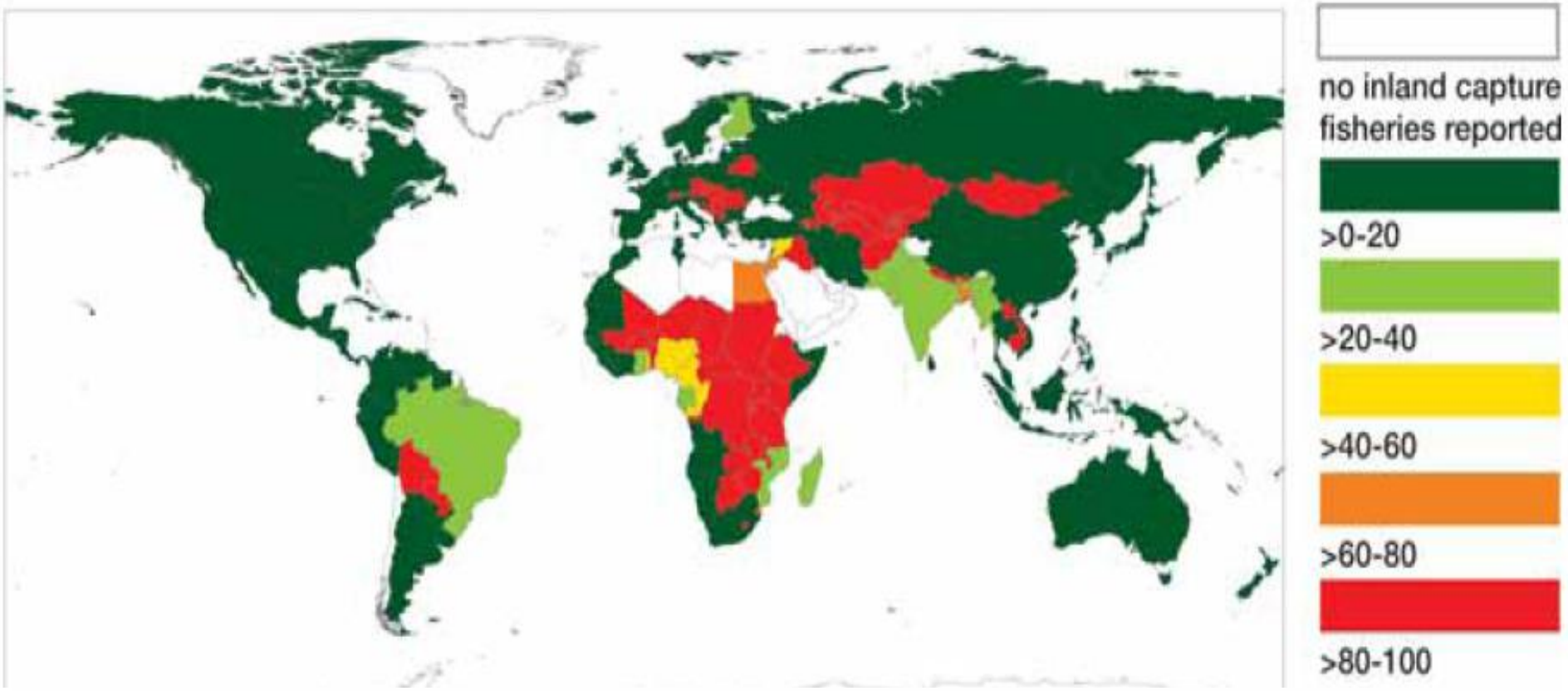


Figure 5. ***(a) Annual harvest from inland fisheries; (b) Proportion of total catch from wild fisheries that comes from inland systems; (c) Inland capture production per capita*** *(data from FishStat plus, 2010).*

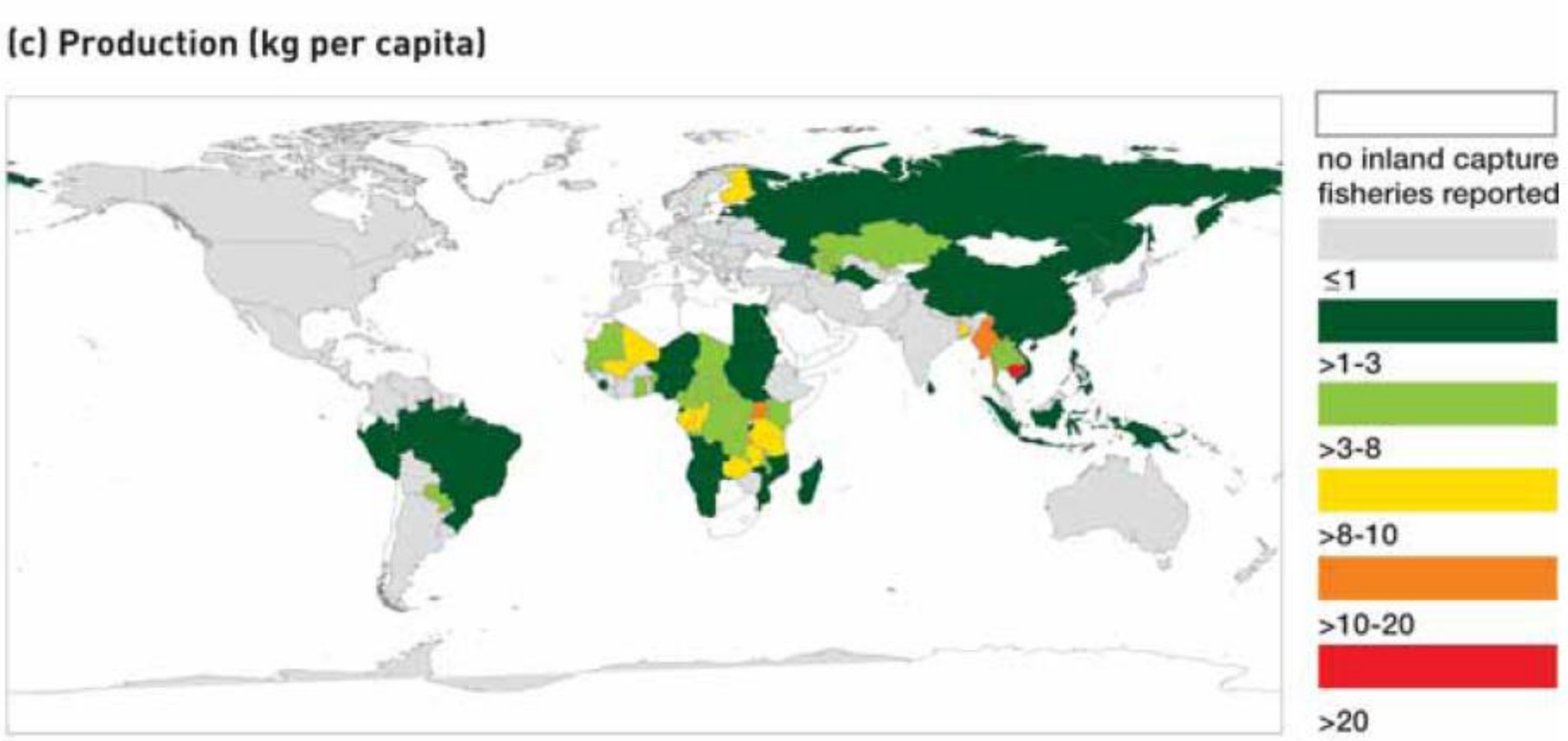


Figure 5. ***(a) Annual harvest from inland fisheries; (b) Proportion of total catch from wild fisheries that comes from inland systems; (c) Inland capture production per capita*** *(data from FishStat plus, 2010).*

Table 3. ***Estimated number of people employed in inland fisheries in selected countries*** *(derived from BNP, 2008).*

Country	No. of Fishers (million)	No. of Other Jobs (million)	Total Jobs (million)	Percentage Men Employed	Percentage Women Employed
Bangladesh	1.0	1.2	2.2	97	23
Brazil	0.15	0.05	0.2	88	12
Cambodia	0.6	0.96	1.6	43	58
China	0.75	0.48	1.2	48	52
Ghana	0.07	0.04	0.1	67	33
India	1.10	4.4	5.5	28	72
Mozambique	0.07	0.02	0.09	95	5
Nigeria	0.32	1.4	1.7	27	73
Senegal	0.04	0.002	0.04	96	4


Sahara Desert
NIGER
CHAD
Lake Chad
Kano
Maiduguri
www.freeworldmaps.net
BENIN
Kainji Reservoir
Jos Plateau
Mandara Mts
Niger
Abuja
NIGERIA
Benue
Mambila Mts
Ibadan
Chappal Waddi
2419
Udi Hills
Lagos
Gulf of Guinea
CAMEROON
Niger Delta
Port Harcourt
Download more at Learnclax.com

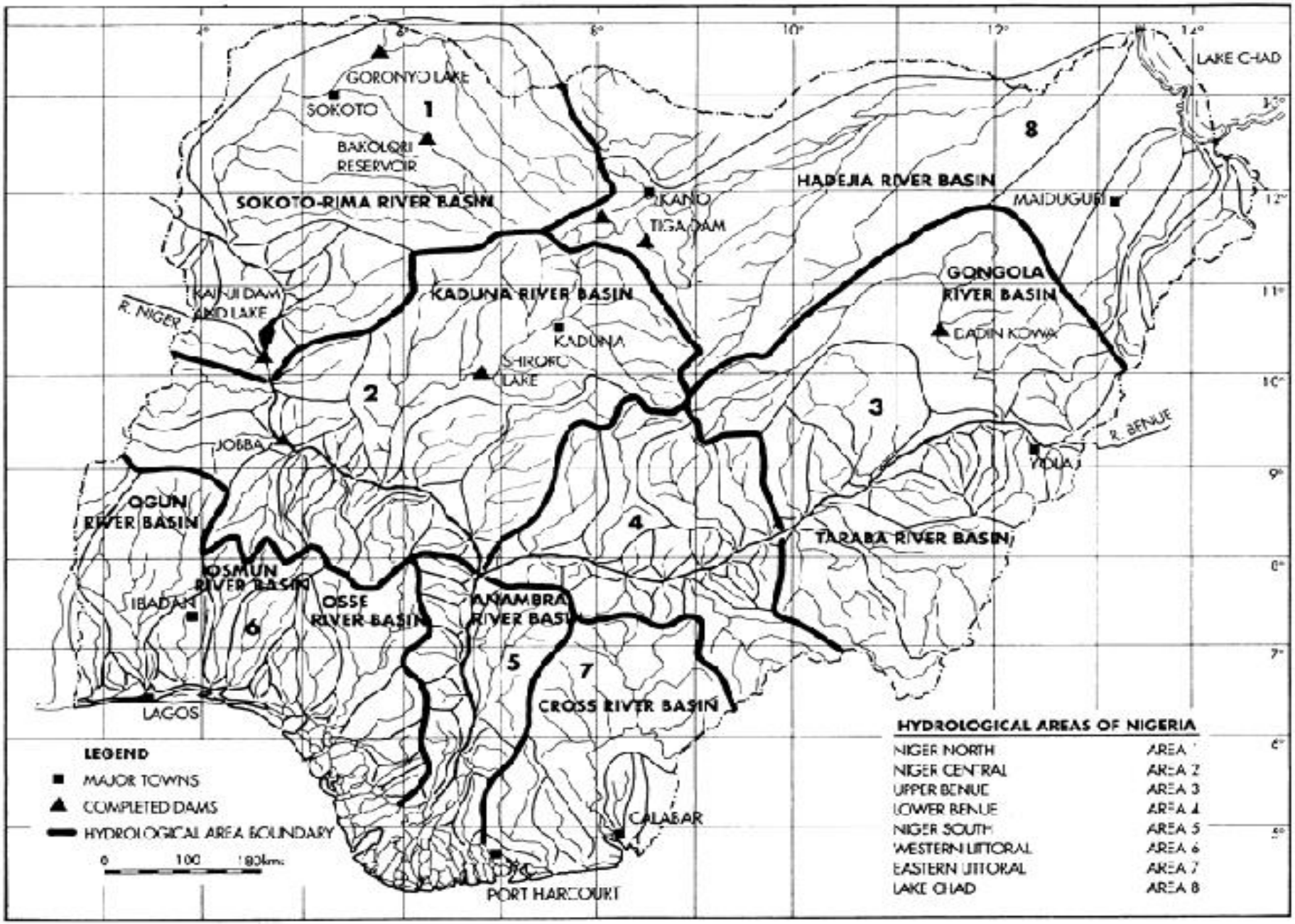
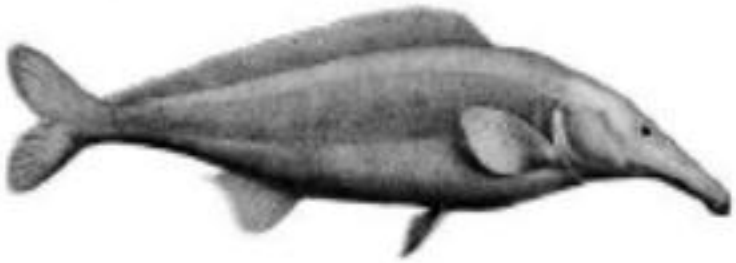


Fig. 1. Hydrological map of Nigeria showing the major inland waters

Representative freshwater fish



Mormyrus rume (Trunk fish)

Citharinus citharus

Polypterus senegalus

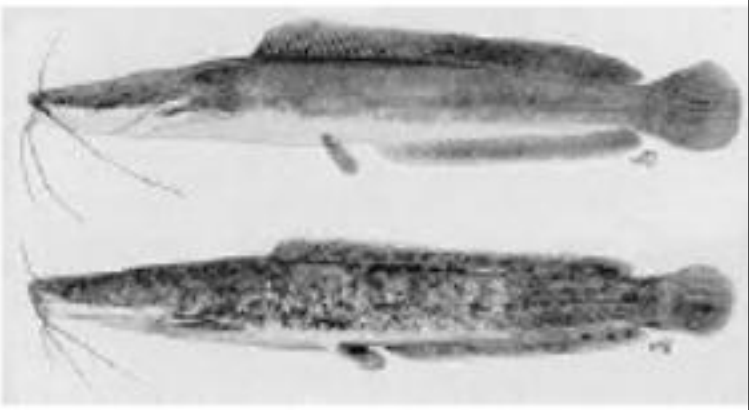
Hetoritis niloticus

Representative freshwater fish

Oreochromis niloticus (Tilapia)

Protopterus annectens

Gymnarchus niloticus



Arias species

(1) ACANTHURIDAE: *Acanthurus monroviae* 230mm SL *(Ph: Bianchi)*

(2) BALISTIDAE: *Balistes capriscus* (Ph: Bellemans)

(3) BALISTIDAE*Balistes punctatus* *(Ph: Bellemans)*

(4) BOTHIDAE:*Bothus podas africanus* (Ph: Bellemans)

(5) CARANGIDAE: *Branchiostegus semifasciatus* (Ph: Bellemans)

(6) CARANGIDAE: *Alectis alexandrines (Juvenile)* 230mm SL (Ph: Bianchi)

(7) CARANGIDAE: *Alectis alexandrines (adult)* (Ph: Bellemans)

(8) CARANGIDAE: *Campogramma glaycos* (Ph: Bellemans)

Plate 2. Representative Marine Fishes.

MAIN DEVELOPMENT AND MANAGEMENT ISSUES FACING THE FISHING INDUSTRY

1. Fishery Statistical Data

1. It is recognized that some effort and progress have been made in the collection and compilation of biological data and fishery statistics
2. there are still a lot of information gaps on
   - landings by artisanal and industrial fishing boats
   - by-catch of shrimpers and finfish trawlers
3. need to update the inventory of all types of
   - canoes,
   - number of fishermen,
   - fishing gears and
   - landing sites along the entire coast of Nigeria

1. Fishery Statistical Data

4. it is necessary to revise the inventory of all industrial fishing vessels, indicating nationality of vessel, type of boat, horse power, overall length, grt and several gear characteristics.
5. Without reliable fishery data and statistics of what is currently being caught, it is obviously difficult to predict future trends.
6. Also a series of catch and effort statistics, if continued over a period of years provides the best measure of changes in a stock of fish and the impact on fishing on it.

Fishery Legislations and Surveillance

1. Rational management of the fishery resources in the Exclusive Economic Zone (EEZ) requires greater control of fisheries.
2. It is vital that proper fishery legislation and regulations be established and whenever possible be harmonized with those of adjacent coastal States jointly exploiting the resources.
3. A national forum is needed to discuss problems connected with the implementation of fishery regulations.
4. In the context of extended jurisdiction the most obvious set of actions are the controls set on fishing in the new EEZ, especially on foreign fishing.
5. These measures have little direct impact on the inshore fisheries which are of interest to artisanal fishermen. However, there can be interactions, with various fisheries and these should be taken into account in choosing controls.

3. Conflicts between Artisanal and Industrial Fisheries

- It has been reported that in Nigeria conflicts occur between the artisanal and industrial demersal fleets when fishing on the same grounds.
- In order to protect the artisanal fishery, the fishery authorities have adopted the following restrictions:
  - the inshore trawlers are not allowed to fish at depths less than 20 m or
  - less than 2–3 miles from the shoreline.
- It has been noted more recently that the regulations are not always respected and that artisanal fishing gears are occasionally damaged by industrial trawlers operating very close inshore.
- Since the inshore areas of the continental shelf are spawning grounds for a number of demersal fish, pelagic species and also penaeid shrimp, it would be very useful if the competent fishery authorities should take the necessary actions to rectify the situation and save the inshore fisheries from collapsing.

4. Development and Management of Fisheries

1. fishing intensity is determined by
   - The density of fish stocks,
   - the catch rates of individual fishermen
   - catch rates of trawlers/shrimpers
2. For stocks that are rather heavily fished as those of Nigeria any increase in fishing effort will decrease the catches and catch rates of vessels already fishing.
3. If the well-being of existing fishermen is a priority fishery policy issue, then entry of additional trawlers and shrimpers must be allowed with very much caution.

4. Development and Management of Fisheries

4. The introduction of industrial fishing vessels for exploiting the stocks which are fished by canoe fishermen in the inshore waters will have definitely adverse effects.
5. Fishery administrators must carefully evaluate the benefits of some increased catches in a short-run and the social costs of some artisanal fishermen being forced to abandon fishing.
6. There is a difficult question of fishing on the spawning concentrations. The artisanal fisheries are in the shallower inshore areas, estuaries and lagoons which are also the spawning and nursery areas of many species.

4. Development and Management of Fisheries

7. Some of these species exploited in inshore waters are also caught in offshore waters when they are bigger.
8. Hence, fishing activities of the artisanal fishermen can result in a decrease in total weight of catch and size of species caught.
9. The fishery manager in Nigeria has a difficult choice to make between increased total catch by the expanding industrial sector and the well-being of the artisanal fishermen before allowing more expansion of the industrial fleet.

4. Development and Management of Fisheries

10. The establishment of EEZ provides an opportunity to control foreign fishing through the increased awareness at high political levels of the importance of rational management of fisheries in the whole zone from the coast out to 200 mi, for the greater benefit of the inshore artisanal fishermen.

Continuous assessment

ZLY 31

- This Continuous assessment contains 30 questions. You will have 1 minute for each question. Please read carefully the question and provide your answer by selecting the most appropriate answer from the given four answers by crossing (x) on the number related to the answer.

Q1.

Cycloid scales are present in

a. bony fish
b. cartilaginous fish
c. both of those
d. none of those