Overview of Small Scale Fisheries Data Collection in Tanzania

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Introduction

- In developing countries, small scale fisheries catch data-collection and analysis systems, are not performing satisfactorily;

- Why?

  - ❑ Systems not giving out what is needed for assessing the appropriate management decisions;

  - ❑ Not tracking the trends of exploitation of fishery resources and the overall performance of existing fisheries management measures.

- Management agencies required to have appropriate and accurate information for management of the fishery resources which is continuously collected, processed, analyzed and provided in a timely manner.

- In fisheries,

  - ❑ reliable and accurate information is crucial because only well informed decision makers can make good decisions on fisheries resource exploitation.

Introduction

- Collection of fisheries statistics, form an important step towards proper management of the fishery resources;

- Data collection in most developing countries and especially in artisanal fisheries is a challenge since;

  ❑too many in the fishery;

  ❑little is known on stocks size;

  ❑entry is free (free access nature)

  ❑exploitation effort;

  ❑biological as well as cost benefit analysis.

From data to management - Virtuous cycle

- CAS
- Fisheries-dependent
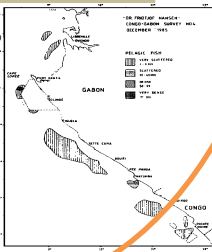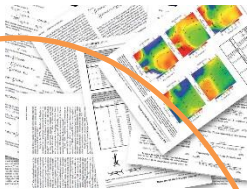- Others (e.g. international databases)

Data collection
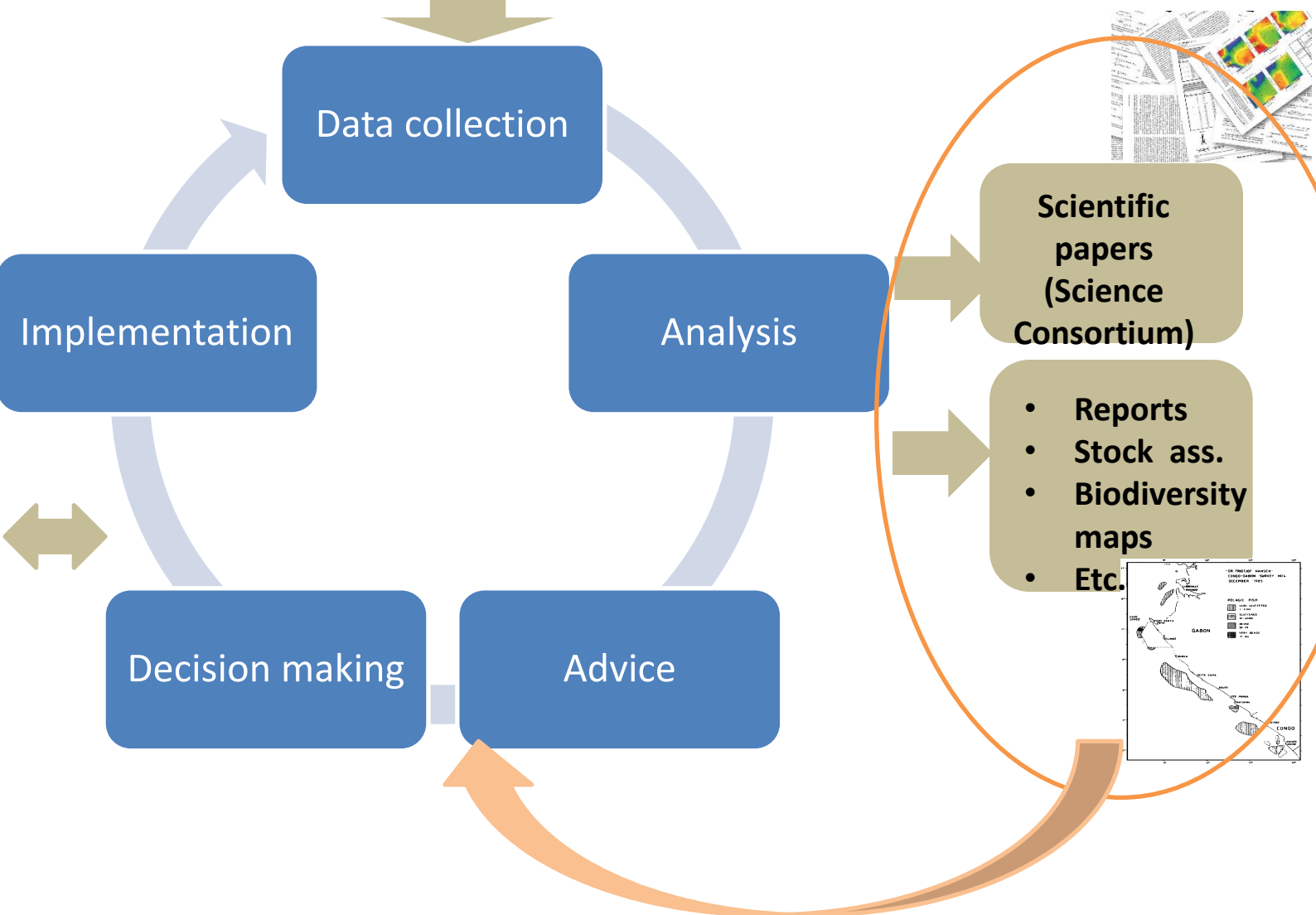
Analysis

Implementation

Advice

Decision making

Scientific papers (Science Consortium)

- Reports
- Stock ass.
- Biodiversity maps
- Etc.

- **Fisheries**
- **RFBs**
- **UN, FAO**
- **Universities**
- **Etc.**

Water bodies of Tanzania

Fisheries categories

- **Artisanal** – small scale
- operating in shallow waters
- using small sized vessels and gears non mechanized but employs less technology
- The artisanal fishery is the most important fisheries as it supports majority of the fishing communities.

- **Industrial**
- Distant Water Fishing Nations
- EEZ - Tuna and tuna like species including Yellowfin, Bigeye, Marlins, Sword fish and, Sharks
- Deep Sea Fishing Authority was established with the aim of overseeing all matters pertaining to deep sea fishing in the United Republic of Tanzania.
- The fishery is operating under license agreement and target species catches are landed to their (DWFN)

History of data collection
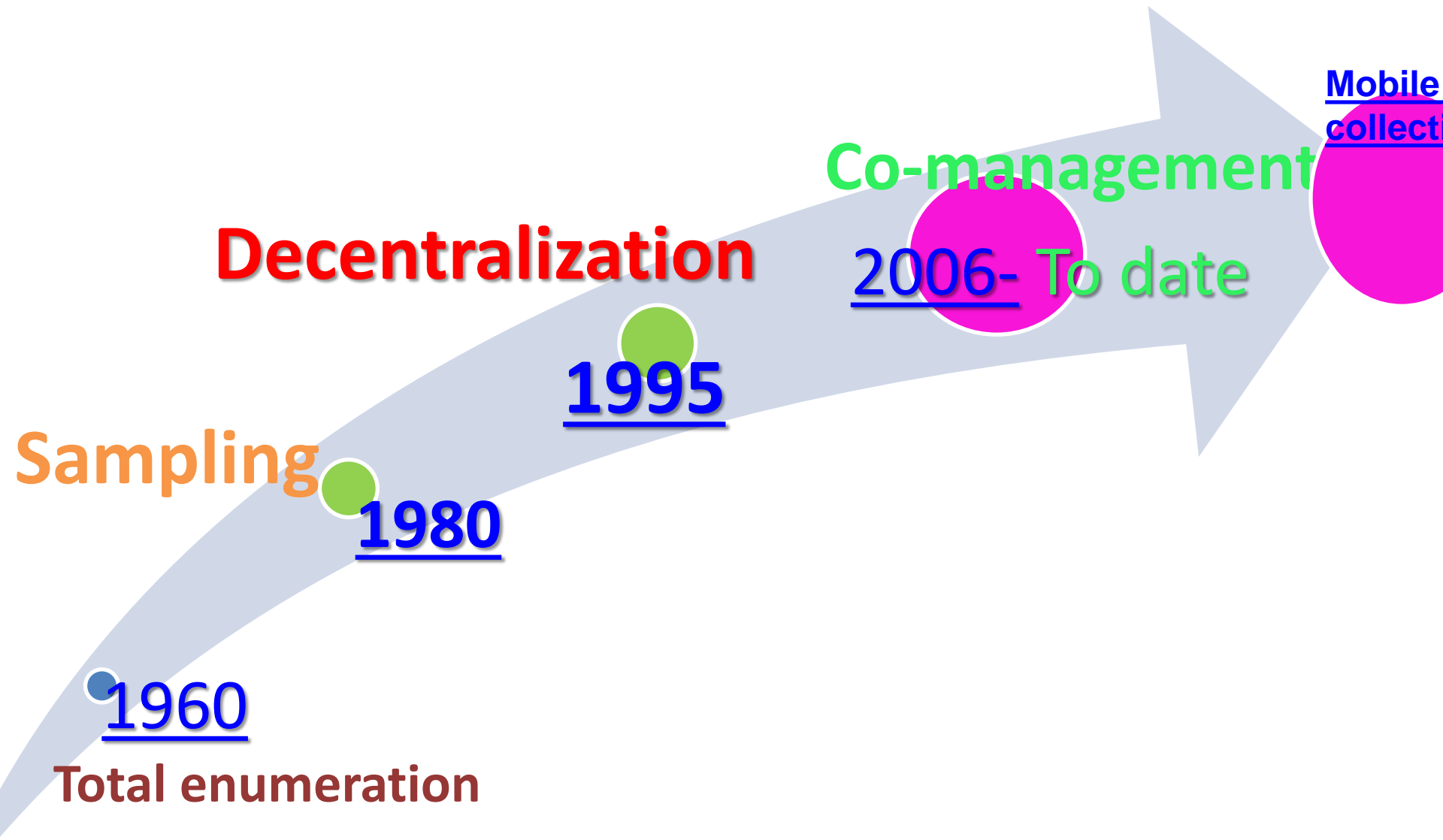
History of data collection in Tanzania

Mobile data collection

Establishment of Co-management, Trained in data collection, Questionnaire translated

Co-management Fishery – dependent data monitoring

Random sampling of days (16/month all boats were sampled; fishing effort were not recorded; estimated production formula wrongly calculate

stratified-random sampling

Population increased; History of data collection More fishers; No of L.sites increased,

1990, Popn. increased, district established and gazette a number of landing sites, This makes total enumeration to be impossible

1960 - Fisheries Dpt. established; Few fishers, One L.Site/District. TOTAL ENUMERATION

In each District, there is one Fisheries Officer who assigned to record fisheries catch landed in the landing site; all the data are summed to get total catch statistics.

History of data collection in Tanzania

- Collection of fisheries statistics started since 1960's
  - Fisheries Department was established;
    - There was one Landing Site in each district;
      - with one Fisheries Field Officer who collect data;
    - The Fisheries Field officer has to collect all data in each day;

$\sum(c_1+c_2+c_3+\ldots c_n)$

Total enumeration;

History of data collection

- Due to increase population,
    - No of fishers increased
    - No of landing sites increased with years while,
    - Fisheries Field Officer became few and fewer;
  - Sampling system starts (Space and time);
  - Administrative strata (district)
  - Landing sites were randomly sampled for 16 days per month and all landed boats were sampled;

❖ *Boat as a sampling unit*

  - **Total catch = CPUE*BAC*F_{cap}*A**
  - **Total catch = $CPUE_{boat}$*BAC*$F_{cap-boat}$*A**
    - BAC=No. of active fishing boats/fishing capacity
    - A=Number of fishing days per month
    - F_{cap} =Fishing capacity

History of data collection in Tanzania

- Sampling days changed from 16 – 10 days /month;
  - limited field officers from the district authorities;
  - To calculate effort - gear – hour combination were sampled (fishing time);

❖ *Gear as a sampling unit*

Total Catch = CPUE*Fishing capacity*activity level*

Total catch = CPUE$_{gear}$*F$_{cap-gear}$*GAC*A

Fishery-dependent data monitoring

- 1996 **- Decentralization** system was introduced;

- Fisheries field officers (data enumerators) were under the Local Government Authorities;

- Many of them were laid off from the office work leaving fisheries data collection activity unperformed;

- Remaining officers have to perform all of the many functions coming under the heading of "fisheries"; e.g.

  - fisher's registration,

  - licensing,

  - fisheries revenue collection;

Fishery-dependent data monitoring

- Beach Managament Units (BMU's) were established;

- Their role and responsibility among others, is data collection;

- Data collection form translated to local language;

- Sampling days changed from 16 to **10** or **8** depends on the available gear;

- ***Boat - Gear combination as a sampling unit***

- **Total catch = CPUE $_{boat-gear}$ *F$_{boat-gear}$ *BGAC*A**

  = CPUE *Fishing Effort

ESTIMATED FISH CATCH

Est. CATCH = **CPUE** X **EFFORT**

Frame Survey

Active days

Landing Survey

BAC Survey
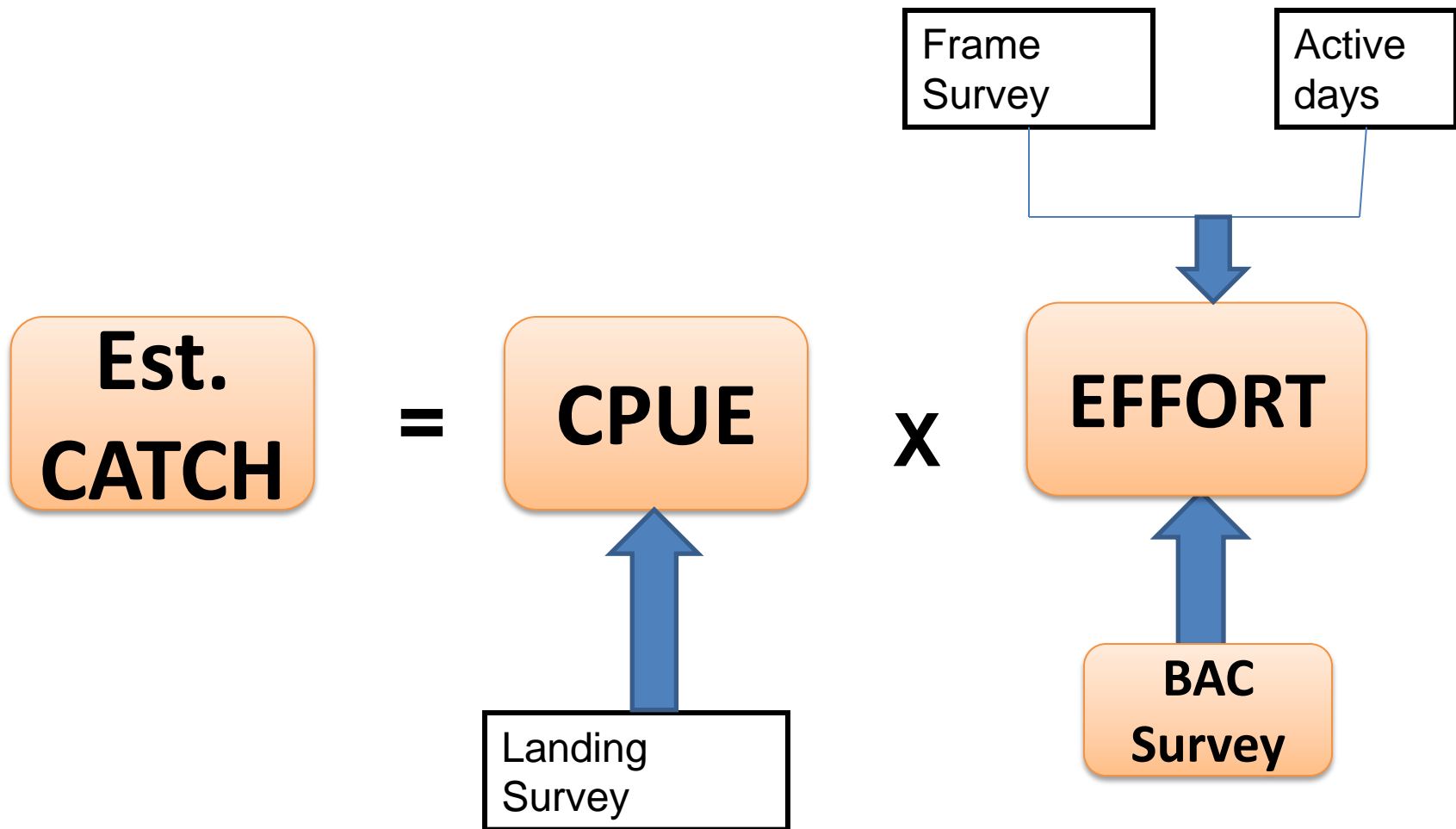
Mobile data collection

- Mobile Application was designed for data collection and installed to data enumerators;

- Provide effective monitoring in data collection and reporting;

- In monitoring aspect,

  - time of recording, (date and time);

  - where the data were taken (latitude and longitude);

  - how many data were sampled per day and per month (to reach the target);

  - It will also alert the enumerator if he has not going to the landing sites if it's a recording day and inform him about the location of data collection;

- In reporting;

  - Real time data

Mobile data collection

- Web based Database;

- The estimation process based on boat-gear combinations:

  - Dugout conoe with Handline;

  - Outrigger canoe with Gillnet;

  - Dhou with ringnet; etc

- Boat-gear combination and species classification were systematically reviewed from the last frame survey;

- Boat-gear types must be grouped to make data collection sustainable and increase the samples needed at district level;

Challenges

- System sustainability;
- Sustainability of the system - financial mechanism;
  - BMU's are working on voluntary basis;
  - Source of power, electricity; at the remote areas;
  - Funds for electricity; to pay for the bill;
- Network availability (Phone companies);
- Inadequate expert on databasese;
- Technology;
- Low committeemen to some data enumerators;

Conclusion

- The collection and analysis of fisheries data is costly and time-consuming exercise.
- The mobile collection system shows good results compared to previous system in -
  - accuracy,
  - reliability and
  - has a good monitoring aspect in collection process.
  - The advantage of this system is real time data and enumerators were getting time to perform other fisheries related duties in their offices;
  - The use of BMU has been seen as a first step in preparing them to take up their role in a community-based approach in the management of the fishery resources.

Thank you for listening

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Lake Victoria

Country	Area owned km^2	Shoreline (km long)	Shoreline Percentage %
Tanzania	**35,088 (51%)**	**1,150**	**33**
Uganda	29,584 (43%)	1,750	51
Kenya	4,128 (6%)	550	16
Total	68,800 (100%)	3,450	100

Lake Tanganyika

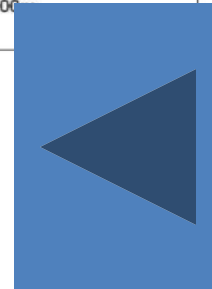| Country	Area owned km²	Shoreline (km)	Percentage %
Tanzania	13,489	669	41
Burundi	2,632	215	8
Zambia	1,974	159	6
DRC(Zaire)	14,805	807	45
Total	32,900	1,850	100
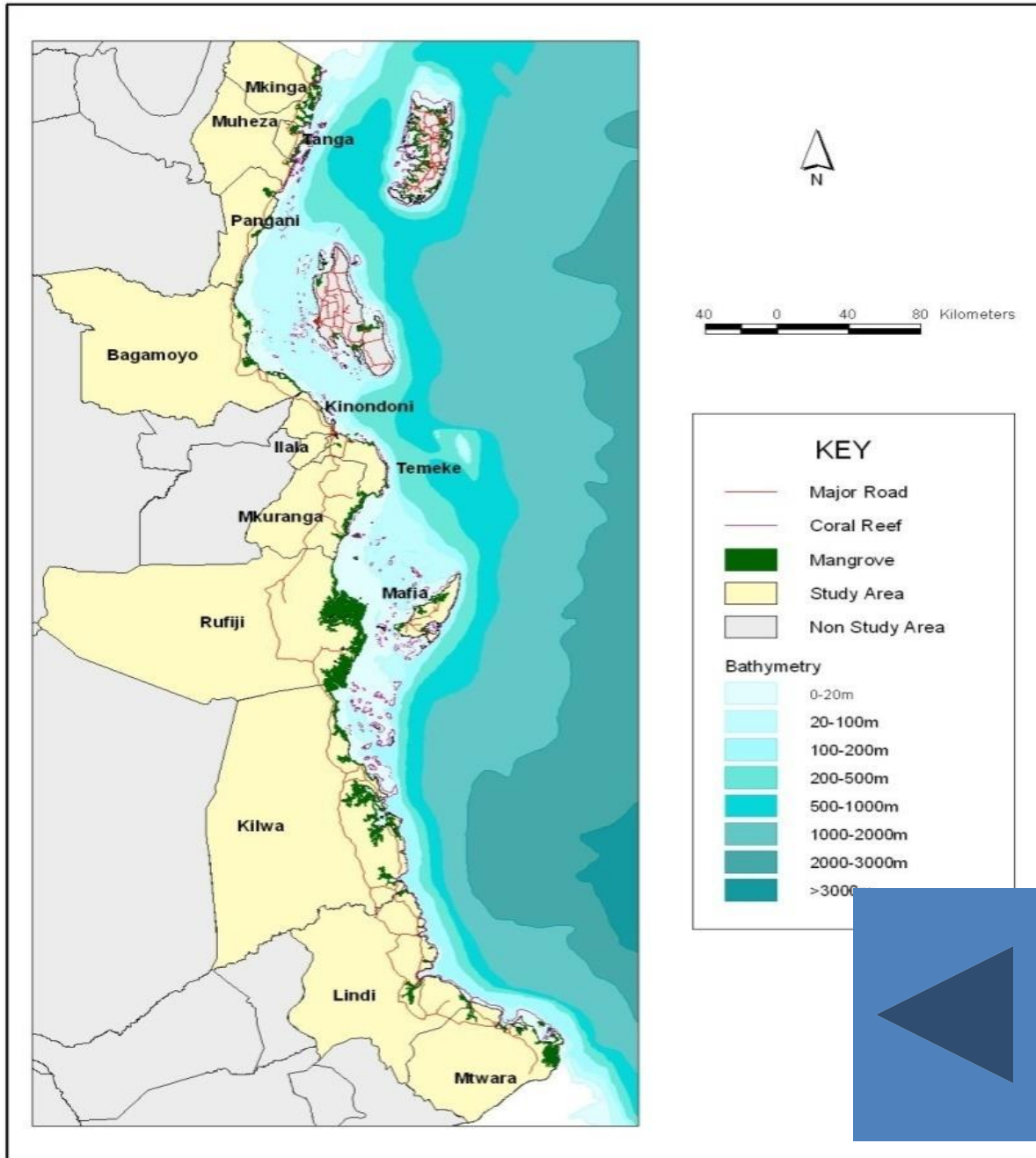
18 Coastal districts;

Coastal line 1,424 km long;

Marine territorial waters and

EEZ of 223,000 sq km.

History of data collection in Tanzania

1960's   **1980's**   **1995**   **2006**   **Mobile data**

Few LS

Few Field Officers

One LS One staff

Total enumeration

Population increase

STRATIFICATION (Administration – strata;)

No of LS increased

RANDOM SAMPLING (BT)

No of fishers Increased

Decentralization

10 sampling days

Fewer Fisheries Officers

Real time data

Co management regime

Beach Management Units –Data enumerators