



AFRICAN UNION
**INTERAFRICAN BUREAU
FOR ANIMAL RESOURCES**

A PAN-AFRICAN STRATEGY ON THE IMPROVEMENT OF FISHERIES AND AQUACULTURE DATA COLLECTION, ANALYSIS AND DISSEMINATION

May 2014

ACRONYMS AND ABBREVIATIONS

ACBF	The African Capacity Building Foundation
AfDB	African Development Bank
ANAF	Aquaculture Network for Africa
AU	African Union
AU IBAR	African Union Inter-African Bureau for Animal Resources
AUC	African Union Commission
BA	Basin Authority
BC	Basin Commission
CAADP	Comprehensive Africa Agriculture Development Programme
CAMFA	Conference of African Ministers of Fisheries and Aquaculture
CCRF	The Code of Conduct for Responsible fisheries
COFI	Committee on Fisheries
COREP	Regional Fisheries Commission for the Gulf of Guinea
CPUE	Catch per Unit of Effort
EAF	Ecosystem Approach to Fisheries
ECCAS	Economic Community of Central African States
FAO	Food and Agriculture Organization of the United Nations
FAO Strategy-STA	FAO strategy for improving information on Status and Trends in Aquaculture
FAO Strategy-STF	FAO strategy for improving information on Status and Trends in Capture Fisheries
FCWC	The Fisheries Committee for the West Central Gulf of Guinea
FIRMS	Fishery Resources Monitoring System
GDP	Gross Domestic Product
GIS	Geographical Information System
ICP-Africa	International Comparison Program for Africa (ICP-Africa)
KMFRI	Kenya Marine Fisheries Research Institute
LVFO	Lake Victoria Fisheries Organisation
MCS	Monitoring, Control and Surveillance
MDG	Millennium Development Goals
NEPAD	New Partnership for Africa's Development
NFFP	NEPAD-FAO Fish Programme
NPCA	NEPAD Planning and Coordinating Agency

NSDS	National Strategy for the Development of Statistics
NSO	The National Statistics Office
NSS	National Statistical System
PDA	Personal Digital Assistant
REC	Regional Economic Community
RFB	Regional Fisheries Body
RFMO	Regional Fisheries Management Organisation
SHaSA	Strategy for the Harmonization of Statistics in Africa
SWIOFC	South West Indian Ocean Fisheries Commission
UNECA	United Nations Economic Commission for Africa
UNGA	UN General Assembly
UNSC	United Nations Statistical Commission

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INFORMATION NOTE
(Events leading up to preparation of the Strategy)

African fisheries and aquaculture data-collection systems are not performing satisfactorily, and do not deliver all the information required for assessing the appropriateness of fisheries and aquaculture policy and management decisions, and for tracking the status of exploitation of fishery resources and the overall performance of existing fishery management measures.

The above has been recognised during several high-level pan-African meetings on fisheries and aquaculture such as: Fish for All (Nigeria, 2005); The Conference of African Ministers of Fisheries and Aquaculture (The Gambia, 2010); Think Tank meeting on the formulation of a Pan-African Policy Framework and Comprehensive African Fisheries Reform Strategy (Côte d'Ivoire, 2012); and the Think Tank Validation meeting on the formulation of Pan-African Policy Framework and Comprehensive African Fisheries Reform Strategy (Cameroon, 2012).

Therefore, the African Union (AU) prioritised the improvement of information on African fisheries and aquaculture through the development of a strategy for this purpose. The CAMFA Decisions related to "improve scientific knowledge" and the subsequent Pan-African Strategy on Improvement of Fisheries and Aquaculture Data Collection, Analysis and Dissemination were in response to this call.

This strategic document is intended to provide a framework and guidelines that should lead to improvements in the availability and quality of national and regional data to support fisheries management, aquaculture development and policy development.

The NEPAD Planning and Coordinating Agency and the FAO, through the NEPAD-FAO Fish Programme (NFFP), in collaboration with the African Union Inter-African Bureau for Animal Resources (AU-IBAR) assisted in developing the thematic areas of the strategy during a Think Tank meeting held in Nairobi (Kenya, 8 -9 July 2013). The meeting was attended by 22 fisheries/aquaculture and statistics experts from AU Member States, Regional Economic Communities (RECs), Regional Fishery Bodies (RFBs), Basin Commissions (BCs), the AU Commission (Statistics Division), the African Development Bank (AfDB) and FAO.

The drafting of "The Pan-African Strategy on the Improvement of Fisheries and Aquaculture Data Collection, Analysis and Dissemination" was done by a small group of experts from the Think Tank meeting, during a two-day retreat at the NPCA office (27-28 August 2013) in Midrand, South Africa, as mandated by the Nairobi Think-Tank meeting. The drafting exercise was guided by the outcome of the Nairobi Think Tank meeting.

This document presents the draft of the Pan-African Strategy on the Improvement of Fisheries and Aquaculture Data Collection, Analysis and Dissemination, circulated to stakeholders for comments.

ACKNOWLEDGMENTS

The Pan-African Strategy on the Improvement of Fisheries and Aquaculture Data Collection, Analysis and Dissemination was prepared by The NEPAD Planning and Coordinating Agency and the FAO, through the NEPAD-FAO Fish Programme (NFFP), and the African Union Inter-African Bureau for Animal Resources (AU-IBAR) in collaboration with AU Member States, Regional Economic Communities (RECs), Regional Fishery Bodies (RFBs), Basin Commissions (BC), the AU Commission (Statistics Division), and the African Development Bank (AfDB).

The thematic areas of the Strategy were formulated during a Think Tank meeting held in Nairobi (Kenya, 8 -9 July 2013) by: Adel A. Shaheen (Benha University, Egypt), Alushe Nditya (NPCA), Bright Onapito (ANAF), Edward Kimani (KMFRI/SWIOFC), Emile Essema (COREP), Eusebio Siquela (Fisheries Dept., Mozambique), Friday Njaya (Fisheries Dept., Malawi), Georges Mba-Asseko (NEPAD-FAO Fish Programme), Gertjan de Graaf (FAO Consultant), Luca Garibaldi (FAO), Mohamed Seisay (AU-IBAR), Nelson Afonso, (Fisheries Dept., Mozambique), Ngarhimdi Rassembaye (CEEAC/ECCAS), Peter Nzungi (Fisheries Dept., Kenya), Samson Abura (LVFO), Samson Bel-Aube Nougbodohoue (AUC), Sedzro Kossi Maxoe (CPCO/FCWC), Simplicie Nouala (AU-IBAR), Toivo Uahengo (MFMR, Namibia), and Vincent Ngendakumana (AfDB).

The drafting of the Strategy was done during a two-day retreat of experts at the NPCA's office (27-28 August 2013, Midrand, South Africa) by Mohamed Seisay (AU-IBAR), Toivo Uahengo (MFMR, Namibia), Friday Njaya (Fisheries Dept., Malawi), Georges Mba-Asseko and Gunilla Greig (NEPAD-FAO Fish Programme), Alushe Nditya (NPCA), and Gertjan de Graaf (FAO Consultant), as mandated by the Nairobi Think-Tank meeting.

EXECUTIVE SUMMARY

The availability of reliable data is one of the prerequisites for informed decision making in fisheries and aquaculture. In order to improve the quality of fisheries and aquaculture statistics, which must inform countries, regional bodies and the AUC on the status and trends of African fisheries resources, the African Union prioritised the development of a pan-African strategy on the improvement of fisheries and aquaculture data collection, analysis and dissemination.

The Strategy was developed during a consultative process led by the NEPAD Planning and Coordinating Agency (NPCA) and the FAO, through the NEPAD-FAO Fish Programme (NFFP), and the support of the African Union Inter-African Bureau for Animal Resources (AU-IBAR).

The major objective of the pan-African Strategy is: *to provide a framework and guidelines that should lead to improvements in the availability and quality of national and regional data to support fisheries management, aquaculture development and policy development in Africa.*

The Strategy should ensure accuracy, sustainability, relevance, timeliness, comparability, availability, and accessibility of fisheries and aquaculture collected data-the major features to be considered when fisheries and aquaculture data-collection systems are designed and implemented.

The thematic areas of this strategy, covering marine and inland fisheries, industrial, semi industrial and artisanal, aquaculture production and post-harvest activities, including marketing and trade information, are:

1. A conceptual framework and guiding principles;
2. A list of core indicators/variables to be collected at the national level;
3. The institutional setting for the exchange of information ;
4. Fisheries and aquaculture statistics and its incorporation into National Statistical Systems and the National Strategy for the Development of Statistics (NSDS);
5. Capacity building;
6. An action plan for implementation including considerations for funding.

The five years Pan African Strategy for improvement of Fisheries and Aquaculture Data Collection, Analysis and Dissemination focus on keys areas of actions as (i) capacity building including storage and exchange of information systems, (ii) coherence and coordination, (iii) ownership and funding and (iv) monitoring and reporting.

I. INTRODUCTION

Knowledge of the status and trends of fisheries and aquaculture, including socio-economic aspects, is key to the development of sound policy, more informed decision-making and responsible fishery management and aquaculture development. At the national level, it is necessary to help determine the social and economic benefits of fisheries and aquaculture, including food and nutrition security. Such information is also essential for assessing the appropriateness of fisheries and aquaculture policy and management decisions, and for tracking the status of exploitation of fishery resources and the overall performance of existing fishery-management and aquaculture-development measures.

The collection and analysis of fisheries and aquaculture data is a costly and time-consuming exercise. Persisting problems of insufficient human and financial resources for data collection, or inefficient data-collection schemes, have often resulted in poor-quality information that have led to no or limited use of statistics for fishery management and policy development in Africa. Recently, the FAO reported that, for the 2009 statistical inquiry, 21 (39%) out of 54 African countries were unable to provide national fisheries statistics, and for another 12 countries (22%), the data submitted were considered inadequate in relation to the relative importance of fisheries in the countries (Garibaldi, 2012).

The Conference of African Ministers of Fisheries and Aquaculture (CAMFA, 2010), urged AU Members States and Development partners to put in place efforts to improve scientific knowledge and build capacity. This is a requirement to ensure adequate informed decision making.

Against this background, there is a need to review the current methodology which African Member States are using for data collection and analysis in order to develop a common strategic framework for its improvement. Furthermore, it is critical to assess and determine strategies for linking fisheries and aquaculture statistics with other national-level development priorities and objectives.

Therefore, the African Union prioritised the need to improve the information of African fisheries and aquaculture through the development of a strategic framework; “The Pan-African Strategy on Improvement of Fisheries and Aquaculture Data Collection, Analysis and Dissemination” has been developed in response to this call.

The time frame of the strategy will be five (5) years from 2014 after his endorsement by the AU Summit (2014 – 2019). The objective is that the information available as a result of the implementation of this strategy provide an accurate picture of fisheries and aquaculture in Africa, thereby helping decision makers takes more informed decisions on the sustainable development of the sector.

II. BACKGROUND

II.1. The African Context

Fisheries and aquaculture constitute an important role in the overall rural and agriculture complex of employment generation and food production in Africa. This complex is key to economic growth, enhanced living standards, poverty reduction and increased food security and is directly linked to the Millennium Development Goals (MDGs) and the Comprehensive Africa Agriculture Development Program (CAADP).

The Comprehensive Africa Agricultural Development Program, which includes fisheries and aquaculture, is designed to help African countries reach a higher path of economic growth. As an African-led and African-owned process, through the African Union's New Partnership for Africa's Development (NEPAD), CAADP addresses policy and capacity issues across the entire agricultural sector and the African continent. CAADP aims to:

1. Designate agriculture-led growth as a main strategy to achieve the Millennium Development Goal (MDG) of halving the proportion of poor and hungry people;
2. Pursue a 6 per cent average annual agricultural-sector growth rate at the national level;
3. Allocate 10 per cent of national budgets to the agricultural sector;
4. Use regional complements and cooperation to boost growth; and,
5. Promote partnerships, policy dialogue, review, and accountability to improve efficiency.

The Maputo declaration in 2003 urged AU MS to increase the contribution of national budget allocation to agriculture, including the fisheries sector.

The NEPAD plan of Action 2005 (Abuja Summit) recognises the vital contributions by African inland and marine fisheries to food security and income of many millions of Africans and to poverty reduction and economic development in the continent. The Plan emphasized that regional capacity for research and development needs to be strengthened; and technical expertise in the region needs to be supported through networking and improved communications.

The first Conference of African Ministers of fisheries and aquaculture in 2010 noted the importance of scientific evidence in decision making for rationale management of fisheries and aquaculture development and accordingly make recommendation in this respect. This observation contributed in large measure to inclusion of conservation of fisheries uses as a key pillar in the Pan African fisheries policy framework and reform strategy. CAMFA urged AU MS to undertake reforms in the fisheries sector so as to attain 6 % contribution of the sector to National Gross Domestic product (GDP).

The pan-African Strategy on the improvement of fisheries and aquaculture data collection, analysis and dissemination will be linked to and in support of existing continental and global statistics efforts and other initiatives. Within the African context, these include: (i) NEPAD's

Fishery and Aquaculture Action Plan (2005), (ii) The Pan-African Fisheries Policy Framework and Reform Strategy, (iii) the African Charter on Statistics, (iv) Strategy for the Harmonisation of Statistics in Africa (SHaSA) and (v) the Initiative to Improve Statistics for Food Security, Sustainable Agriculture and Rural Development.

II.2. The Global context

Within the global context, the FAO strategies on the improvement of information on status and trends in capture fisheries and aquaculture respectively (STF/STA) and the Global Strategy on improvement of Agriculture and Rural Statistics should be taken into consideration during the Pan-African strategy on the improvement of fisheries and aquaculture data collection, analysis and dissemination.

A. FAO strategies on improvement of information on status and trends in capture fisheries and in aquaculture

FAO, at the request of its Committee on Fisheries (COFI), initially developed a strategy for improving information on status and trends of capture fisheries (FAO Strategy-STF). COFI adopted the Strategy by consensus, and in 2003, it was endorsed by the FAO Council and by the UN General Assembly (UNGA). A similar strategy for aquaculture, the FAO Strategy STA, was developed in 2008.

Both documents, the FAO Strategy–STF and the FAO strategy-STA, are voluntary instruments that apply to all States and entities. Their overall objectives are to provide a framework for the improvement of knowledge and understanding of fishery and aquaculture status and trends as a basis for fisheries and aquaculture policy-making and sustainable management. The FAO Strategy-STF and STA are implemented through agreements between States - directly or through Regional Fishery Bodies (RFBs). Both strategies provide a list of required actions for the achievement of their objectives.

B. Global Strategy for Improving Agricultural and Rural Statistics

In order to respond to the declining quantity and quality of agricultural statistics in developing countries, a Global Strategy for Improving Agricultural and Rural Statistics was produced which was endorsed in February 2010 by the United Nations Statistical Commission (UNSC). The purpose of the Global Strategy is to provide a framework and methodology that will lead to improvements in the availability and quality of national and international food and agricultural statistics, to guide policy analysis and decision making.

The accompanying Action plan 2011-2015, on Improving Statistics for Food Security, Sustainable Agriculture and Rural Development, aims to implement the Global Strategy for Improving Agricultural and Rural Statistics in Africa and supports the CAADP process.

II.3. The pan-African strategy on improvement of fisheries and aquaculture data collection, analysis and dissemination.

The major objective of the pan-African Strategy is: *to provide a framework and guidelines that should lead to improvements in the availability and quality of national and regional data to support fisheries management, aquaculture development and policy development in Africa.*

The Strategy should ensure accuracy, sustainability, relevance, timeliness, comparability, availability, and accessibility of collected data-the major features to be considered when fisheries and aquaculture data collection, analysis and dissemination systems are designed and implemented.

The thematic areas¹ of this strategy covering marine and inland fisheries, both industrial and artisanal, aquaculture production and post-harvest activities, including marketing and trade information, are:

1. A conceptual framework and guiding principles;
2. A list of core indicators/variables to be collected at the national level;
3. The institutional setting on the exchange of information;
4. Fisheries and aquaculture statistics and its incorporation into National Statistical Systems and the National Strategy for the Development of Statistics (NSDS);
5. Capacity building;
6. An action plan for implementation including considerations for a funding strategy;

The thematic areas of the strategy are presented in the next chapters.

¹ As developed during a Think Tank meeting held in Nairobi, Kenya, 8-9 July 2013.

III. CONCEPTUAL FRAMEWORK AND GUIDING PRINCIPLES OF THE STRATEGY

The conceptual framework is primarily guided by:

- The Code of Conduct for Responsible fisheries (CCRF);
- The Comprehensive Africa Agricultural Development Program (CAADP).

III.1. The Code of Conduct for Responsible Fisheries and the Ecosystem Approach to Fisheries and Aquaculture

Fisheries management, as practised since the early 1940s, is strongly focused on fishing activity and the target fish resources. By the late 1980s, it became clear that marine fisheries resources could no longer sustain rapid and often uncontrolled development. As pressure on resources and ecosystems increased, the shortcomings of this single-species approach became more obvious. A new approach, which embraced conservation and environmental considerations more thoroughly, an Ecosystem Approach to Fisheries (EAF), was urgently needed. Applying the EAF will be assisting in implementing many of the provisions contained in the FAO 1995 Code of Conduct for Responsible Fisheries (FAO, 2003).

The purpose of *an ecosystem approach to fisheries and aquaculture* is to plan, develop and manage fisheries and aquaculture in a manner that addresses the multiplicity of societal needs and desires, without jeopardizing the options for future generations to benefit from a full range of goods and services provided by marine ecosystems. Therefore, “an ecosystem approach to fisheries strives to balance diverse societal objectives, by taking account of the knowledge and uncertainties about biotic, abiotic and human components of ecosystems and their interactions and applying an integrated approach to fisheries within ecologically meaningful boundaries” (FAO, 2003).

Information required to support the development of fisheries management plans based on the ecosystem approach is grouped into the following three categories (FAO 2005):

1. Contributions of the fishery to ecological well-being;
2. Contributions of the fishery to human well-being;
3. Ability to achieve the management objectives.

III.2. The Comprehensive Africa Agriculture Development Programme and the Global Strategy to Improve Agricultural and Rural Statistics

The Comprehensive Africa Agriculture Development Program (CAADP), which includes fisheries and aquaculture, is designed to help African countries reach a higher path of economic growth.

Information collected within the framework of the Global Strategy to Improve Agricultural and Rural Statistics, which supports the implementation of CAADP, are grouped in three dimensions:

1. The economic dimension,
2. The environmental dimension,
3. The social dimension.

In addition to the dimensions, the cause-and-effect relations that connect them is incorporated, which is essential for linking statistical information across the different domains.

III.3. The conceptual framework of the pan-African strategy on the improvement of fisheries and aquaculture data collection, analysis and dissemination.

Combining the EAF and CAADP/Global data collection frameworks provides the frame work for Fisheries and Aquaculture data collection and information as presented in Figure 1.

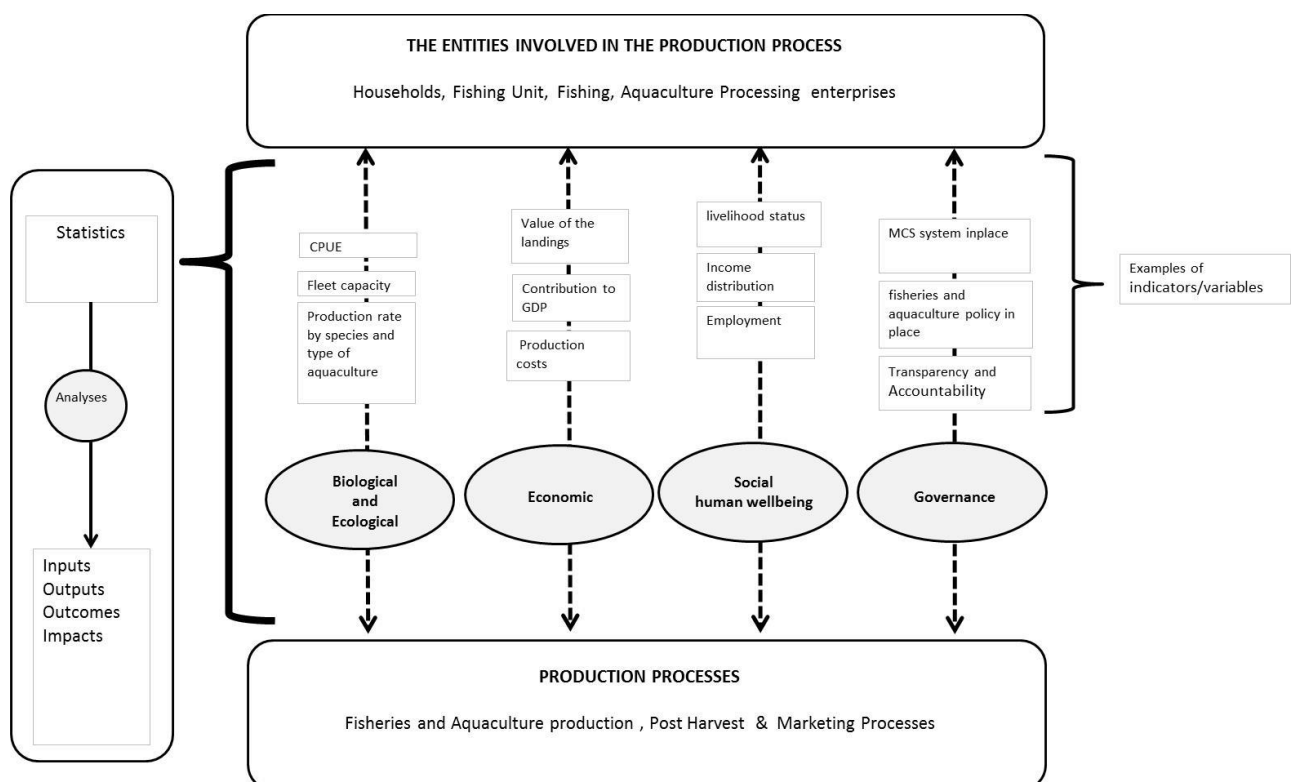


Figure 1: The conceptual frame work of the pan-African strategy on improvement of fisheries and aquaculture data collection, analysis and dissemination

A. Dimensions

The dimensions are incorporated to provide the broader context of fisheries and aquaculture and to grasp the relations with Economic, Social and Governance Issues.

The Biological & Ecological dimension covers the traditional fisheries data collection related to the target species as well as the impact of fisheries on the environment and the impact of the environment on fisheries. Major indicators for this domain are total catch by species, Fishing effort, Fleet capacity, CPUE, Stock sizes, Water temperature, Production rate by species and Type of aquaculture system, etc.

The Economic dimension covers the economic aspects of fisheries and aquaculture production processes, at unit level, fleet level and national level. Major indicators for this domain are: Value of the landings/marketed fish, Production costs, Profitability, Contribution to GDP, Fish-exports earnings, etc.

The Social Human well-being dimension covers the aspect related to the households and communities involved in fisheries and aquaculture and the impact of fisheries and aquaculture on their well-being. Major indicators are: Employment, Income distribution, livelihood status, etc.

The Governance dimension covers all aspects related to the capacity to manage the fisheries or to develop aquaculture and examples of indicators are: the existence of a fisheries and aquaculture policy or an MCS system and the extent to which these policies/systems are being implemented, Management cost-recovery rate, Transparency and, Accountability in fisheries management systems/regimes, Percentage of resources co-managed, Status of property rights, etc.

B. The production entities and production processes

In Figure 1 at the top bar, the entities involved in the production processes are indicated, and in the bottom bar the production process itself; they are linked with each other through the dimensions. This illustrates that all data collected should always provide information on the *production process* and *the production entity involved*. For example, the production cost from artisanal fishing units is linked to the fishing household, the CPUE to a Fishing Unit, and employment in aquaculture is linked to a household, etc.

C. The inter relations

Linking the production entities with the production processes for all data collected for all the dimensions allows for the linking of statistical information across the different statistical dimensions.

D. The statistics and analyses

On the top left-hand side of Figure 1, the data collected, *the statistics*, leave the system and can be analysed.

E. Inputs, Outputs, Outcomes and Impacts

After analysis, the system will provide information on:

- the inputs needed for the different production systems;
- the output or production levels;
- the outcomes or income/earnings of the production entities; and
- the impact of the production process on higher development goals, such as food security, poverty reduction and economic developments.

III.4. The guiding principles for collecting, analysing and disseminating fisheries and aquaculture information

The Strategy is guided by the following principles²:

Sustainability: Arrangements for collecting, analysing and disseminating fisheries and aquaculture information should be viable in the long term. As a consequence, adequate funding should be provided at the national level.

Cost Effectiveness: Considering the budget limitations for data collection in Africa, arrangements for collecting, analysing and disseminating fisheries and aquaculture information should be cost effective and concentrate on the essential, core data.

Best Scientific evidence: Arrangements for collecting, analysing and disseminating fisheries and aquaculture information should contribute to the best scientific evidence that can be made available. Protocols for assuring the quality and accuracy of the data collected and disseminated should be applied wherever and whenever practical and appropriate.

Participatory and Cooperative: Arrangements for collecting, analysing and disseminating fisheries and aquaculture information should adopt mechanisms for the inclusion of all relevant participants in the preparation, analysis and presentation of fishery information. Relevant participants may include, *inter alia*, fishers, industry representatives and non-governmental organizations. States should, in accordance with international law, cooperate with other States in developing and maintaining such fishery information, as appropriate, either directly or through appropriate inter-governmental organisations, including regional fishery bodies and arrangements. States should provide feedback on the status and trends of fisheries to all relevant participants.

Comparability: Indicators used should be comparable across countries and regions.

Objectivity and Transparency: Arrangements for collecting, analysing and disseminating fisheries and aquaculture information should contribute to the provision of the best scientific evidence that can be made available, and to transparency, while respecting any confidentiality requirements. Any uncertainty associated with status and trends information should be pointed out.

Timeliness: Arrangements for collecting, analysing and disseminating fisheries and aquaculture information should result in information being provided in a timely manner.

Flexibility: Arrangements for collecting, analysing and disseminating fisheries and aquaculture information should be flexible enough to permit adjustments as necessary to ensure that they effectively support fishery policy making and management through the provision of appropriate information.

Ownership: Arrangements for collecting, analysing and disseminating fisheries and aquaculture information should be part of national priorities.

² The principles were formulated by the Think Tank meeting in Nairobi (2013) and drew upon the principles for FAO STF.

IV. A LIST OF CORE INDICATORS AND THE MASTER SAMPLING FRAME

On the continent, reliable data on total catches, catch composition, fishing effort, size of fleets and catch rates and socio economic information are often lacking for both industrial and small-scale fishery and aquaculture sectors. For example, in West Africa only 15% of the countries have reliable information on the total catch of artisanal fisheries, 31 % of the countries have reliable data on the total catch of industrial fisheries, and 23 % of the countries have reliable data on the income of fishers (de Graaf *et al.*, 2012). There are several constraints related to data collection, of which the key ones are the following:

- Funds for fisheries-independent data collection through scientific surveys are limited and often donor dependent;
- The level of funding and staff allocations provided by national governments are limited or even lacking;
- Knowledge of and capacity available for the design and implementation of sample-based surveys and their statistical requirements are limited; sample-based surveys are essential for small-scale fisheries;
- Weak institutional arrangement at national level, e.g. the fisheries line institutes, responsible for fisheries and aquaculture data collection, are not well linked to national statistics bureaus, and, at the regional level, the institutional arrangements for exchange of information between fisheries and economic organisations are not well established;
- Reported figures often do not include gender-disaggregated data, subsistence or occasional fishers who, during parts of the year, often depend on the fisheries resources as part-time fishers;
- For aquaculture, a major constraint is the limited sampling frame providing information on the number of aquaculture units, culture characteristics, area coverage and geographical positions.

Considering these constraints, obtaining reliable data from the different sectors of fisheries and aquaculture can only be achieved by setting up robust yet cost effective data-collection systems that would provide basic information on the fisheries and aquaculture operations.

The list of core data for fisheries and aquaculture that each country should collect is presented in Table 1. The minimum set covers more or less the essential national and regional information needs (by RFBs and RECs) for fisheries and aquaculture management and policy development.

IV.1. Core Indicators and Variables in fisheries and aquaculture sector

Indicators and variables

A variable is what is collected in the field and an indicator is used to monitor the effectiveness or performance of management- and policy actions implemented. The elaboration of some indicators requires the combination of multiple variables, and certain variables, such as catch, effort and value, are vital to a wide variety of indicators or may in themselves be used as indicators.

Table 1: Core variables to be collected at the national level, indicating the sector covered and the data-collection strategy³

VARIABLE TO BE COLLECTED	SECTOR COVERED	DATA COLLECTION STRATEGY
Fleet structure by fishing units, numbers and characteristics	Semi-industrial/Industrial/Artisanal/Inland	Census, registration
Fishing effort by fishing unit/gear type	Semi-industrial/Industrial/Artisanal/Inland	Sample based, census
CPUE by major species and fishing unit/gear type	Semi-industrial/Industrial/Artisanal/Inland	Sample based, census
Total catch by major species and fishing unit/gear type	Semi-industrial/Industrial	Census, reporting
Fish price by species (vessel/landing site/farm gate/processing)	Semi-industrial/Industrial/Artisanal/Inland/Aquaculture/Processing	Sample based
Annual production cost by sector and unit	Semi-industrial/Industrial/Artisanal/Inland/Aquaculture/Processing	Sample based
Employment by gender and sector	Semi-industrial/Industrial/Artisanal/Inland/Aquaculture/Processing	Sample based
Total quantity of Processed fish produced by type of product and type of processing	Processing/Trade	Sample based
Quantity and value of aquatic products exported by type	Processing/Trade	Census, reporting
Quantity and value of aquatic products imported by type	Trade	Census, reporting
Production rates by aquaculture-production type and species	Aquaculture	Sample based
Number and unit area by aquaculture-production type (e.g. pond and cages)	Aquaculture	Census, registration

To foster informed decision-making on fisheries and aquaculture in Africa, Member States should ensure that they collect these variables in a timely manner.

³ Semi-industrial is included to reflect the use of this term for classification purposes in certain Member States

IV.2. The Master Sampling Frame

African fisheries are dominated by artisanal fisheries and data can only be collected through sample-based surveys. In this respect, the development of a “*master sampling frame*”, as recommended by the Global Strategy to Improve Agricultural and Rural statistics, is of importance:

“More than one governmental organization is often involved in the collection and analyses of agriculture, fisheries and forestry data without coordination. While the National Statistical Office may produce the agriculture census, the annual production data could come from the ministry of agriculture, and the contribution of the fishery and aquaculture sectors may come from another authority and may be ignored or neglected by the National Statistical Office. In some cases different organizations produce statistics for the same items with different results, which confuses the data users and make it difficult to aggregate results across countries. This means that the results then differ also at international level if those organisations use different source to populate their data bases”.

“The integration of Agriculture into the national statistical system will be based on statistical tools that establish a closer link between results from different statistical processes and different statistical units. This can be achieved by the development of a master sampling frame, the adoption of sample designs such as overlapping samples, and the synchronisation of questionnaire designs and surveys”. (World Bank, FAO, and United Nations. 2010)

This integration process is especially important for Aquaculture and Small-Scale fisheries

A. Aquaculture and the master sampling frame

As a farming system, aquaculture can be compared with agriculture and livestock rising, and could be covered in a master sampling frame.

B. Small-scale fisheries and the master sampling frame

The dispersed character of small-scale fisheries implies that they can be covered only through sample-based surveys. The foundation of such a survey is “*the sample frame*” which is used to design the sampling scheme and to estimate the parameters of the target fishery. This sampling frame is often obtained through a frame survey implemented by the department of fisheries. However, frame surveys are often allocated insufficient financial as well as human resources, leading to statistically invalid results. The cost of data collection in small-scale fisheries can be minimized without violating statistical procedures, by changing the approaches to establishing the sampling frame either:

- by making use of external resources, e.g. by including fishery questions in more general activities such as a population or agricultural census; and/or
- by embarking upon full registration, combined with the licensing and numbering of vessels, the latter option that could provide basic structural data on small-scale fisheries as in many countries, the fishery regulations allow for or mandate small-scale fishing vessels to be registered, and boat-owners must have an official license to fish.

V. INSTITUTIONAL SETTING FOR THE EXCHANGE OF INFORMATION

Fisheries and Aquaculture data collection is a national responsibility, but the information collected will be used by a large number of different users and the statistical system should be able to serve all those different users.

V.1. Data Users

In principle, fisheries information is used by different stakeholder groups to:

1. report on status and trends of fisheries and aquaculture sector for management purposes;
2. formulate management plans for resource management (national line agencies and regional fisheries bodies);
3. formulate development plans for aquaculture (national line agencies);
4. support the development of policies related to resource management, food security, employment, etc. (at the national level, different ministries and at the regional level, regional economic bodies).

The above results in a rather complex flow of information, outlined below. The sharing of information from the national data collection systems with different users is vital and requires that national fisheries and aquaculture information systems are in place, including arrangements for the provision and sharing of information.

A. National level

Data on fisheries and aquaculture at the national level are often collected by the department of fisheries or a fisheries research institute. The data are analysed and used to report on fisheries and aquaculture status and trends including processing, MCS and trade, and to formulate national fisheries-management plans. Aggregated data are provided to the national statistical office to be included in the national statistical bulletin and for the use of policy makers. Aggregated data could also be made available to the general public.

B. Regional and continental level

Information will be provided to Regional Fisheries Organisations for the formulation of fisheries management plans of shared stocks. Further, aggregated data can be provided by either the fisheries department or by the National statistical office to regional information systems to support policy development at regional level, most notably the RECs.

C. Global level

AU Member States are requested to report data on capture and aquaculture production, trade of fishery products, employment and fleets. FAO collates the national data into the global fishery databases that are made available to the public and are largely used for trend studies and analysis. Fishery statistics are generally submitted to FAO by national officials in the appropriate ministry or institution but, to increase the completeness of the information, data are also derived from other sources (e.g. the tuna Regional Fishery Bodies). FAO also manages the Fishery Resources Monitoring System (FIRMS) which includes information on the status of stocks as provided by RFBs and some national institutions.

V.2. Sharing of information flow scheme

Provisions will need to be made within the fisheries ministry/department and regional bodies, to establish nodes/fisheries information systems, for the sharing of information as follows:

- at the national level, for the sharing of information with the National statistical office and for the sharing of information with public users;
- at the regional level, for the sharing of information with the Regional Fisheries Bodies and the Regional Economic organisations;
- at the continental level for the sharing of information with the AU, UNECA, and AfDB;
- at the global level for the sharing of information with Development partners including FAO.

The flow chart for the sharing of information is presented in figure 2.



Figure 2 : Flow chart of the exchange of information from the national systems towards users

All AU Member States should ensure that sufficient financial and human resources are provided for the development and maintenance of national fisheries information systems, the cornerstone for sharing information at national, regional and global level.

VI. SPECIAL NEEDS AT NATIONAL AND REGIONAL LEVELS

VI.1. Institutional settings at national level : Fisheries and Aquaculture statistics and its incorporation into National Statistical Systems (NSS) and the National Strategy for the Development of Statistics (NSDS)

A. The National Statistical Systems (NSS)

National fisheries data-collection systems are often not well integrated into the National Statistical Systems and, as a consequence, are not included in the National Strategy for the Development of Statistics (NSDS).

The National Statistics System is generally composed of:

- The National Statistics Office (NSO) at the center of NSS and is usually in charge of coordination of all national statistical matters, mainly development related;
- The statistical units and directorates, the line ministries and other government specialized agencies;
- The training Centers, schools and universities.

The NSS is placed under the authority of the National Council of Statistics Board or Council, to control the entire NSS and monitor the implementation of the NSDS.

The mission of the NSS is to:

1. Ensure the coordination of the national statistical system;
2. Ensure compliance with the fundamental principles of statistical activities;
3. Ensure cooperation between producers and users of statistical information;
4. Prepare Master Plan for statistical development;
5. Prepare annual national statistical program.

The National Statistical System (NSS) must be able to respond in a precise, effective, and sustainable manner to the changes under way in the societies and economies of developing countries and to the new information requirements they generate. This response entails a coordinated national effort aimed at improving the mechanisms and processes needed to produce relevant statistics. This effort is embedded in a strategic planning process known as the "National Strategy for the Development of Statistics" (NSDS).

B. National Strategy for the Development of Statistics

The National Strategy for the Development of Statistics (NSDS) enables developing countries to build a reliable statistical system that produces the data necessary to design, implement, and monitor national development policies and programs. It also helps countries meet their regional and international commitments with respect to statistics (Millennium Development Goals, regional integration processes, etc.).

An NSDS provides a country with a vision of the development of statistics and a detailed, costed action plan over a period of 5 to 10 years that covers the production of all official statistics.

All AU Member States should ensure that fisheries and aquaculture data collection is integrated with the National Statistical System (NSS) and included in the National Statistical Development Strategy, and that it receives adequate financial and human resources for its effective implementation.

VI.2. Institutional settings at regional level

At the regional level, there are several challenges to exchange information. These include inadequate financial and human resources, leadership management and lack of enabling infrastructure for data storage, statistical analysis and IT infrastructure. There are also institutional challenges which relate to policy, legislation, poor coordination and lack of regional fisheries information systems.

For proper exchange of information between national and regional levels and among various actors, there is a need for institutional processes to be pursued by governments and regional bodies. In particular enabling policy and legislation should be put in place through policy reviews and enactment of required pieces of legislation to establish institutional frameworks and coordination arrangements aimed at defining linkages between processes and structures for storage, synthesis and exchange of information.

The strategy indicates that the AU Members States, directly or through their participation in regional fishery bodies and arrangements, should analyze and agree on policies/strategies and legal frameworks that will facilitate the provision and exchange of information on the status and trends of fisheries as appropriate. These arrangements should set the institutional framework for regional bodies to receive, store, synthesize and disseminate information by addressing the roles and entitlements of the partners, as well as information quality, transparency and confidentiality. Regional Economic Communities should develop a regional vision, a detailed and costed action plan for the development of statistics and monitor their systems for data collection, analysis and reporting.

All regional organisations should ensure that sufficient means are provided for a reliable and viable statistical system (human and financial resources as well as equipment) put in place and that it is operational and delivering fisheries and aquaculture information to users.

VII. CAPACITY BUILDING FOR SUSTAINABILITY

Without capacity building, the statistical systems to be put in place will not ensure accuracy, sustainability, relevance, timeliness, comparability, availability and accessibility of fisheries and aquaculture information in Africa. Capacity must be built at national, regional and continental levels. Capacity for regional integration of fisheries and aquaculture statistics has to be developed so that that more and higher-quality fisheries and aquaculture data can be made available, enabling regional institutions, such as RECs and RFBs, to guide the harmonisation of national fisheries and aquaculture policies.

In Africa, capacity development in fisheries and aquaculture data collection has in many instances focused on training and the provision of equipment without a clear strategy behind it. Africa needs a fisheries statistics capacity-development strategy that takes into account Africa's needs, priorities, challenges and context.

The African Union should develop a mechanism for liaisons and the generation of synergies with other institutions and initiatives that are supporting capacity building in data collection, analysis and dissemination on the African continent, such as:

- (i) The African Capacity Building Foundation (ACBF);
- (ii) The African Development Bank (AfDB);
- (iii) The Program for Harmonization of Statistics in Africa (SHaSA);
- (iv) National Statistical Development Strategies (NSDSs); and
- (v) International Comparison Program for Africa (ICP-Africa).

In order to mainstream fisheries and aquaculture statistics, and improve capacity building for this purpose, it is important to:

- (i) Update the statistical legal and regulatory framework;
- (ii) Incorporate national fisheries and aquaculture data collection, analysis and dissemination into the NSS and NSDS;
- (iii) Strengthen the role fisheries and aquaculture extension services for the collection of data;
- (iv) Assess and prioritize information user needs and tailor date to these needs;
- (v) Foster coordination, collaboration, and partnerships among stakeholders;
- (vi) Enhance the statistical infrastructure, including human-capacity development and strengthened institutions in collection, analysis and dissemination;
- (vii) Develop analytical and interpretation capacity along with common methodology and format of outputs (CPUE, MSY, species compositions, MEY, revenue curve, profitability, socio data, gender and youth data, etc.) for decision making;
- (viii) Develop appropriate curriculums on Fisheries and Aquaculture data collection and statistics and establish regional/continental training centers;

- (ix) Develop archiving and disseminating tools which should include reporting channels system from national to regional, continental to international institutions;
- (x) Promote the use of modern technology in data collection, analysis and dissemination - include GIS, Personal Digital Assistants, smartphones, tablets, etc.;
- (xi) Give consideration to the development of capacity for all stakeholders in data collection, analysis and dissemination.

All AU Member States and Regional Bodies should ensure that the statistical capacity component, a vital part of the implementation of this strategy, is taken into account when designing fisheries and aquaculture data-collection systems.

VIII. ACTION PLAN FOR IMPLEMENTATION INCLUDING CONSIDERATIONS FOR FUNDING

Implementing the Pan African Strategy for the Improvement of Fisheries and Aquaculture Data Collection, Analysis and Dissemination requires that:

- Member States ensure that fisheries and aquaculture data collection, analysis and dissemination is fully integrated into the National Strategy for the Development of Statistics (NSDS).
- Member States ensure that sufficient funds are allocated for fisheries and aquaculture data collection, analysis and dissemination.
- Regional bodies ensure that a detailed and costed vision for statistics is developed and that sufficient funds are allocated for storage, processing, analysis and retrieval of fisheries and aquaculture information.
- The AU endeavour to collaborate with other institutions, including the AfDB, in the implementation of the Pan- African Strategy including the establishment of reliable data centres for fisheries and aquaculture statistics on the Continent.

In addition, it should be considered to invest in:

- (a) the creation of an Africa-wide network of National Fisheries and Aquaculture Data Centers/Information systems that are properly equipped and staffed with trained personnel to provide sound information for local, regional and continental economic planning;
- (b) the strengthening of the statistical capacity of regional organisations;
- (c) the implementation of modern electronic communication systems, such as internet connections and data transfer mechanisms, so as to promote effective communication and to make data and information more readily available for the elaboration of fisheries and aquaculture management and development plans.

To operationalize the strategy, actions are proposed at different levels as presented in the following Table 2.

Table 2: Actions proposed to operationalize the Strategy

INSTITUTION	ACTION/ACTIVITY	TIME FRAME
AUC – AU-IBAR/NEPAD	1. Coordinate the overall implementation of the strategy at regional and Member State levels	2014-2019
	2. Strengthen capacity of member States and RECs including the development of a capacity-development strategy	2015
	3. Establish AUC Working Group on data collection and statistics	2014
	4. Internalize the fisheries and aquaculture Data collection, analysis and dissemination strategy	2015
	5. Establish continental Data Centre for Fisheries and Aquaculture statistics	2016
	6. Harmonize the implementation framework of the Strategy with existing initiatives	2014

INSTITUTION	ACTION/ACTIVITY	TIME FRAME
	7. Elaborate a mechanism for reporting on progress made on implementation	2014
	8. Establish Regional training courses for fisheries and aquaculture data collection and statistics	2016
REC	1. Formulate regional policy for coherent data storage, synthesis and dissemination	2014
	2. Mobilize funding to collect information from the national level and for synthesis and dissemination	2015
	3. Strengthen cooperation and human capacity building in member States	2015-2019
	4. Develop a mechanism for storage, analysis and retrieval of fisheries and aquaculture data and information	2015-2016
	5. Establish mechanisms for reporting on progress in implementing the Strategy	2014
RFB/RFMO/BC/BA	1. Establish regional Data Centre for Fisheries and Aquaculture statistics	2015
	2. Facilitate the harmonization of data-collection systems for shared stocks	2014
	3. Supplement resource mobilization efforts for the region	2015
	4. Coordinate the implementation of the strategy at the regional level	2014-2019
	5. Support and strengthen capacity development strategy on data collection, synthesis and dissemination	2015-2019
MEMBER STATES	1. Implement the parts of the Strategy that speaks to efforts at the national level	2014-2015
	2. Allocate sufficient resources for data collection, analysis and dissemination	from 2015
	3. Establish institutional linkages among data-collection bodies/agencies	2014
	4. Establish National Data Centre/Information systems for Fisheries and Aquaculture statistics where these do not already exist	2015
	5. Undertake capacity building actions for collection, analysis and dissemination	2014-2019
	6. Establish National Strategy for fisheries and aquaculture data collection, analysis and dissemination, where these do not already exist	2014

INSTITUTION	ACTION/ACTIVITY	TIME FRAME
	7. Establish reporting mechanisms to facilitate the sharing of data and information with national users and regional and continental bodies	2014
	8. Sensitize stakeholders on the Strategy and its action plan	2014-2016
	9. Monitor the implementation of the Strategy.	from 2015

In order to reflect the fact that some of these actions will need to be taken earlier during the implementation of the strategy, this will need to be incorporated into the operational plan to be designed and implemented by each country or regional body, when each entity should set its own order of priorities regarding the proposed actions.

The time frame for the implementation of the strategy is five (5) years (2014-2019) and it will be evaluated in 2019 with a mid-term review in 2017. Countries, regional bodies and the AUC should monitor the implementation of the strategy and report on progress to CAMFA.

The main sources of funding for the implementation of the strategy should be the national governments and Regional Bodies.

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