

## Contributions of Marine Libraries in ODINAFRICA to Oceanographic Research: IMROP Researchers

**Assane Deda Fall**

Marine Information Manager and Researcher in the Mauritanian Institute of Research and Oceanographic Fisheries. BP. 22 IMROP-Nouadhibou.

[assanefallus@gmail.com](mailto:assanefallus@gmail.com)

### Abstract

In marine information management, THE ODINAFRICA project participated in training librarians, the creation of a pan-African network of National Oceanographic Data Center (NODC), product development and targeted services for national and regional end users. Currently, over 40 marine-related institutions in 25 African countries including Mauritania have tried to address the challenges faced in access to data and information for coastal management. NODC of Mauritania was established in 2001 under the responsibility of the Mauritanian Institute of Oceanographic Research and Fisheries (IMROP). IMROP has developed several products and services such as ODINAFRICA NODC, project websites, newsletters and brochures, ocean data catalogues (metadata), library catalogues, and directories of experts and institutions. IMROP's librarians also participated in several training sessions on the management of marine information. This paper discusses the project's achievements. A questionnaire was administered to 20 IMROP researchers about their use of products and services and to plan for the maintenance of the various services and databases.

**Keywords** : ODINAFRICA, libraries, Mauritania, IMROP, library services, marine information management, west Africa.

### Introduction

The Ocean Data and Information Network for Africa (ODINAFRICA - <http://www.odinafrica.org/>) has been one of the most successful projects of the International Oceanographic Data and Information Exchange Programme (IODE) of the Intergovernmental Oceanographic Commission of UNESCO (IOC). The Ocean Data and Information Network for Africa (ODINAFRICA) brings together more than 40 marine related institutions from 25 countries in Africa (below) to address the challenges faced in accessing data and information for coastal management. With the support of the Intergovernmental Oceanographic Commission of UNESCO and the Government of Flanders (Kingdom of Belgium) the network strives to address the challenges faced in ensuring that ocean and coastal data and information generated in national, regional and global programs are readily available to a wide range of users in an easily understandable format. The focus of the current phase of the project is strengthening the pan-African network of National Oceanographic Data Centre (NODCs), and marine related institutions, as a sustained mechanism for application of data, information and products in marine and coastal management in Africa. This includes the development of linkages with data generators (including ongoing large-scale projects on the African coasts) and the development of targeted products and services for national and regional end users.

### **Ocean Data Collections and Catalogues (Metadatabases)**

National data collections were developed. These consisted of ocean station data (from global and local sources), satellite analyses, ocean climatologies, weather climatologies, geology, base mapping, ecology, fisheries. The institutions participating in ODINAFRICA have been provided with a data CD containing data from the IOCEA and IOCWIO regions obtained from other IODE data centers around the world. In addition, a program to identify, digitize and repatriate other datasets which are available in foreign institutions to the regions was implemented in the framework of GODAR. Several ODINAFRICA NODCs published their National Marine Database collections on CD-ROMs and other media. A catalogue of datasets can also be accessed through a central GeoNetwork server located at: <http://geonetwork.iode.org/geonetworkAMA>.

### **Sea Level Data Collection**

The African network for measurements and monitoring of sea level was expanded and upgraded by installing new tide gauges in Cameroon, Congo, Djibouti, Egypt, Ghana, and Mauritania. The installation of Global Navigations Satellite Systems – GNSS receivers - at the sea level stations in Takoradi (Ghana), and Inhambane and Pemba (Mozambique) provides the connection between the horizontal and the vertical data at these locations. The tidal and GNSS observations together allows one to monitor crustal motions at the tide gauge locations in order to derive absolute or climate related signals in mean sea level from the tide records. Experts from the African countries used the training provided to analyze data from the sea level stations around Africa and prepare tidal predictions. Information on the network (equipment types and location, reports, trainings, etc.) is available on the African Sea Level Network website (<http://sealevel.odinafrica.org/>), while the data from the stations can be accessed near-real time at [www.sealevelstations.net](http://www.sealevelstations.net). Thanks to the combined efforts of GLOSS, IOC/tsunami and ODINAFRICA, Africa now has a network of 40 sea level stations.

### **Coastal and Marine Atlases**

The African Coastal and Marine Atlas ([www.africanmarineatlas.net](http://www.africanmarineatlas.net)) was initiated as a continental-scale online resource of public domain geospatial data. The project was designed to identify, collect and organize datasets into an atlas of biophysical themes, including base maps, geosphere, hydrosphere, atmosphere, biosphere and the human and built environment. A second aim was to provide training to increase the use of Geographic Information Systems (GIS) and spatial data products for the dissemination of appropriate, timely and relevant information. The inventory of data sets in the atlas is also a useful indicator of gaps, either in the knowledge base or the availability of the data in the public domain. The Coastal and Marine Atlases currently have more than 3,500 maps for different features from the coastal areas of 20 countries. Five regional atlases have also been developed for the Large Marine Ecosystem regions as follows: Agulhas and Somali Current, Benguela Current, Canary Current, Guinea Current, and the Mediterranean and Red Sea regions. The national and regional atlases can be accessed at: [www.africanmarineatlas.org](http://www.africanmarineatlas.org).

### **African Register of Marine Species**

The contribution of the African institutions to the Ocean Biogeographic Information System (OBIS) and the World Register of Marine Species (WoRMS) was improved considerably through the organization of focused workshops during which experts from ODINAFRICA institutions in Africa developed databases on marine mollusks, sponges, and decapods. The work formed the basis for creation of the African Register of Marine AfReMaS (<http://www.marinespecies.org/afremas/Species>), which already had more than 24,300 entries as of the end of August 2013. Some of the institutions have made progress in developing national marine biodiversity databases and making them available online or through the AfrOBIS node, which is one of the global nodes of OBIS. A project to digitize marine biodiversity data

collected in the Gulf of Guinea (in particular national waters of Guinea) by ex-Soviet Union research vessels was implemented and the data generated was included in OBIS.

### **Marine Mammal Survey**

Three ship-based visual surveys of the temporal and spatial distribution of marine mammals in the CCLME region were undertaken during the FAO/CCLME fisheries research cruises off the Northwest African in 2012-2013 on board the R/V Fridtjof Nansen using the following methodology: (a) collection of marine mammal sighting data including number of sightings per species, observer data and relative densities using standard data sampling protocols; (b) Recording of the following parameters: species, GPS position, date/time, bearing /radial distance reaction to vessel, group size, behavior, any cutaneous diseases, associated species, habitat data, voucher photos; and (c) Evaluation of the marine mammal biodiversity, distribution, relative density, seasonality aspects, health status in relation to habitat/oceanography and historical insights from the literature. Training and equipment were provided to marine biologists from the region during these surveys. The data collected have been used to enrich the OBIS database.

### **Document Repositories**

The institutions participating in ODINAFRICA have participated in the development of a database of publications about marine and freshwater science in Africa (OceanDocs - Africa). The repository now has more than 2,500 records from Africa. These publications include books, journal articles, technical reports, theses, etc. The African records in the repository can be accessed at [OceanDocs - AFRICA](#).

### **Literature Catalogues**

ODINAFRICA aims at making library materials in the marine science libraries in Africa accessible locally through the creation of a collective catalogue of co-operating institutes' library holdings. The databases were initially developed using the INMAGIC software. This was later converted to AgriOcean/DSpace and ABCD. The national catalogues were merged into a union catalogue and accessed online briefly - [www.afrilib.odinafrica.org](http://www.afrilib.odinafrica.org). ODINAFRICA also supported the development of an African Union list of Journals from information centers. The list, which currently has nearly 800 serial holdings, can be accessed through the IAMSLIC website: <http://www.iamslc.org/unionlist/africa/index.php>. ODINAFRICA also initiated the development of a Catalogue of Aquatic and Fisheries Publications from/about Africa, with more than 6000 records.

### **Ocean Data Collections and Catalogues**

National data collections were developed. These consisted of ocean station data (from global and local sources), satellite analyses, ocean climatologies, weather climatologies, geology, base mapping, ecology, fisheries. The institutions participating in ODINAFRICA have been provided with a data CD containing data from the IOCEA and IOCWIO regions obtained from other IODE data centers around the world. In addition a program to identify, digitize and repatriate other datasets that are available in foreign institutions to the regions was implemented in the framework of GODAR. Several ODINAFRICA NODCs published their National Marine Database collections on CD-ROMs and other media. A catalogue of data sets can also be accessed through a central GeoNetwork server located at: [www.geonetwork.iode.org/geonetworkAMA](http://www.geonetwork.iode.org/geonetworkAMA).

---

### **Sea Level Data Collection**

The African network for measurements and monitoring of sea level was expanded and upgraded by installing new tide gauges in Cameroon, Congo, Djibouti, Egypt, Ghana, and Mauritania. The installation

of Global Navigations Satellite Systems – GNSS receivers - at the sea level stations in Takoradi (Ghana), and Inhambane and Pemba (Mozambique) provides the connection between the horizontal and the vertical data at these locations. The tidal and GNSS observations together allows one to monitor crustal motions at the tide gauge locations in order to derive absolute or climate related signals in mean sea level from the tide records. Experts from the African countries used the training provided to analyze data from the sea level stations around Africa and prepare tidal predictions. Information on the network (equipment types and location, reports, trainings etc. ) is available on the African Sea Level Network website ([www.sealevel.odinafrica.org/](http://www.sealevel.odinafrica.org/)), while the data from the stations can be accessed near-real time at <http://www.sealevelstations.net>. Thanks to the combined efforts of GLOSS, IOC/tsunami and ODINAFRICA, Africa now has a network of 40 sea level stations.

---

### **Coastal and Marine Atlases**

The African Coastal and Marine Atlas ([www.africanmarineatlas.net](http://www.africanmarineatlas.net)) was initiated as a continental-scale online resource of public-domain geospatial data. The project was designed to identify, collect and organize data sets into an atlas of biophysical themes, including: basemaps, geosphere, hydrosphere, atmosphere, biosphere and the human and built environment. A second aim was to provide training to increase the use of Geographic Information Systems (GIS) and spatial data products for the dissemination of appropriate, timely and relevant information. The inventory of data sets in the atlas is also a useful indicator of gaps, either in the knowledge base or the availability of the data in the public domain. The Coastal and Marine Atlases currently have more than 3,500 maps for different features from the coastal areas of 20 countries. Five regional atlases have also been developed for the Large Marine Ecosystem regions as follows: Agulhas and Somali Current, Benguela Current, Canary Current, Guinea Current, and the Mediterranean and Red Sea regions. The national and regional atlases can be accessed at: [www.africanmarineatlas.net](http://www.africanmarineatlas.net) , while the related metadata is available at: [www.geonetwork.iode.org/geonetworkAMA](http://www.geonetwork.iode.org/geonetworkAMA). The initial continental maps and data sets can be accessed at: [omap.africanmarineatlas.org](http://omap.africanmarineatlas.org).

### **Ocean Data Collections and Catalogues (Metadatabases)**

The contribution of the African institutions to the Ocean Biogeographic Information System (OBIS) and the World Register of Marine Species (WoRMS) was improved considerably through the organization of focused workshops during which experts from ODINAFRICA institutions in Africa developed databases on marine molluscs, sponges, and decapods. The work formed the basis for creation of the African Register of Marine AfReMaS ([www.marinespecies.org/afremas/Species](http://www.marinespecies.org/afremas/Species) – AfReMaS), which already had more than 24,300 as at the end of August 2013. Some of the institutions have made progress in developing national marine biodiversity databases and availing them online or through the AfrOBIS node, which is one of the global nodes of OBIS. A project to digitize marine biodiversity data collected in the Gulf of Guinea (in particular national waters of Guinea) by ex-Soviet Union research vessels was implemented and the data generated included in OBIS.

### **Marine Mammal Survey**

Three ship-based visual surveys of the temporal and spatial distribution of marine mammals in the CCLME region were undertaken during the FAO/CCLME fisheries research cruises off the Northwest African in 2012-2013 on board the R/V Fridtjof Nansen using the following methodology:

- collection of marine mammal sighting data including number of sightings per species, observer effort data and relative densities using standard data sampling protocols,

- Recording of the following parameters: species, GPS position, data/time, bearing /radial distance reaction to vessel, group size, behavior, any cutaneous diseases, associated species, habitat data, voucher photos, and
- Evaluation of the marine mammal biodiversity, distribution, relative density, seasonality aspects, health status in relation to habitat/oceanography and historical insights from the literature.
- Training and equipment was provided to marine biologists from the region during these surveys. The data collected have been used to enrich the OBIS database.

### **Services of the IMROP Library**

The IMROP library's main missions are to support the demand of the researchers. It manages the documentary research and contributes to a better knowledge of the scientific and technical results of the Institute through the management and development of the library: enrichment of the collections through the acquisition of new books; modernization of the library to facilitate the work of users; and training in the use of computer software.

The services implement actions to disseminate scientific and technical information in various forms, including the regular publication of newsletters and newsletters, as well as the organization of scientific events (meetings, symposiums) and the training of users in the use of documentary software.

- Treat, store, produce, disseminate and disseminate scientific information in response to the needs of scientists, administrations, professionals and the general public;
- Development and management of collections and document databases;
- Modernization of the archiving and reception structures of the library;
- Reinforcement of the editorial production of the institute (infographic achievements and production of scientific or popularized documents);
- Institutional communication development of IMROP;
- Participation in exhibitions and organization of events (conferences, symposia, gate days).

### **Management and Development of the Library**

Scientific Information Development Management which aims to ensure the management and development of the library in terms of acquisition, organization and dissemination of scientific and technical information; enriching the documentary stock by acquiring new books; modernization of the library to facilitate the work of users;

### **Goal of the Study**

The goal of the study is to measure users' satisfaction with the services offered by the center as part of the Odinafrica project and to analyze the impact of the ODINAFRICA project in the development of oceanographic research and fisheries in Mauritania. The questionnaire was administered at the headquarters of IMROP. All laboratories were visited and the questionnaire was administered from March 10 to May 25, 2017.

### **Population and Size of Study**

Since IMROP is an interdisciplinary institution, researchers specialize in the disciplines of ecology, biology, chemistry-microbiology, oceanography, stock assessment, socio- anthropology. The study population corresponded to all of the institute's researchers and users of the library. The starting sample size was all IMROP researchers representing 110 people. We were able to interview only 63 researchers in Nouadhibou because they travel frequently. Some of them are also in training, internship or seconded in Nouakchott. The researchers are from :

- The Laboratory of Assessment of Living and Aquatic Resources (LERVA);

- The Laboratory Biology and Ecology of Aquatic Organisms (LBEOA);
- The Laboratory of Social and Economic Studies (LESE);
- The Laboratory of Marine and Coastal Studies (LEMMC);
- The Statistical Service (SS);
- The Documentation and Scientific Information Center (CDI).

The average duration of the interview was approximately 15 minutes.

### Research Methodology

We wanted to cover all the research areas of the scientists to have a good representation of the different opinions on the different services offered by the institute's documentation center thanks to the ODINAFRICA project. To measure user satisfaction with the services offered by the center as part of the Odinafrica project we use a survey to analyze user behavior, their motivations for use and practices, their attitude towards the services offered, their expectations and knowledge of the constraints of the services offered.

### Results

The survey shows that IMROP researchers use more Marine Info Products & Services (Bibliographic Search Services), the Literature Catalogs, which represents 30% of the terms of use of services, offered under the Odinafrica project. The repositories and oceandocs that represent the scanned documents respectively occupy 12 and 13% of the answers. Other services such as the Document Request, the ODINAFRICA Projects Database and the Ocean Data Collection & Services (Ocean Data Collections and Catalogs), the Sea Level Data Collection, the Coastal and Marine Atlases, the African Register of Marine Species, Marine Mammal Survey) .. That represents very low utilization rates between 8 and 3%.

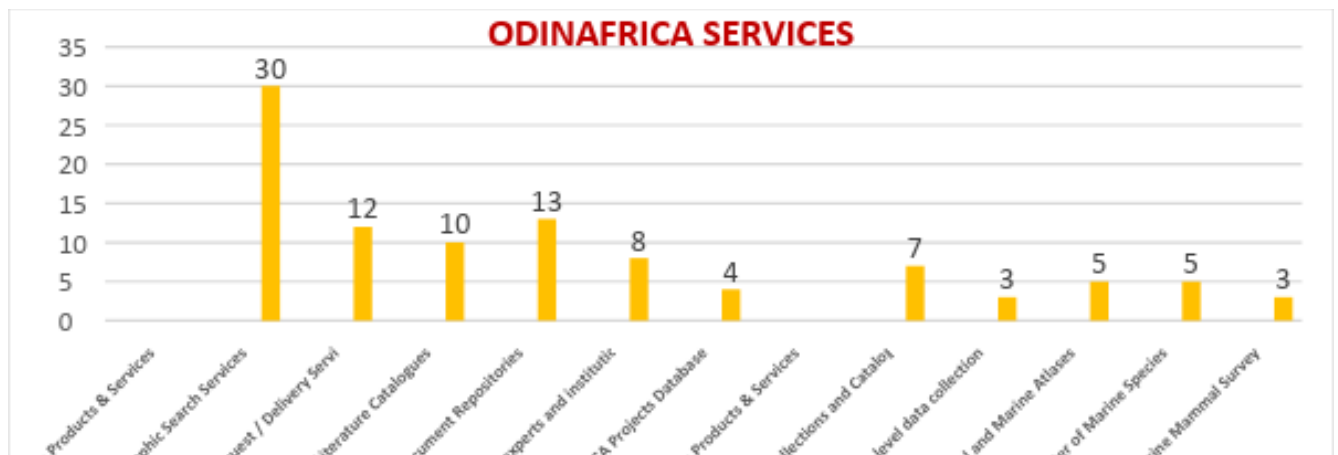


Figure 1. Odinafrica services.

### Contribution to Research Improvement in IMROP

By looking at the use of services by research area, we see that the Laboratory Biology and Ecology of Aquatic Organisms (LBEOA) makes much more use of the services offered by the Odinafrica project with 27% use, followed by the Laboratory of Assessment of Living and Aquatic Resources (LERVA) with 18% use and Laboratory of Marine and Coastal Studies (LEMMC) with 16% use. The (LESE) uses 13% and the Statistical Service (SS) 7% the laboratories seem less to take advantage of the information available and developed in its fields in the Odinafrica project.

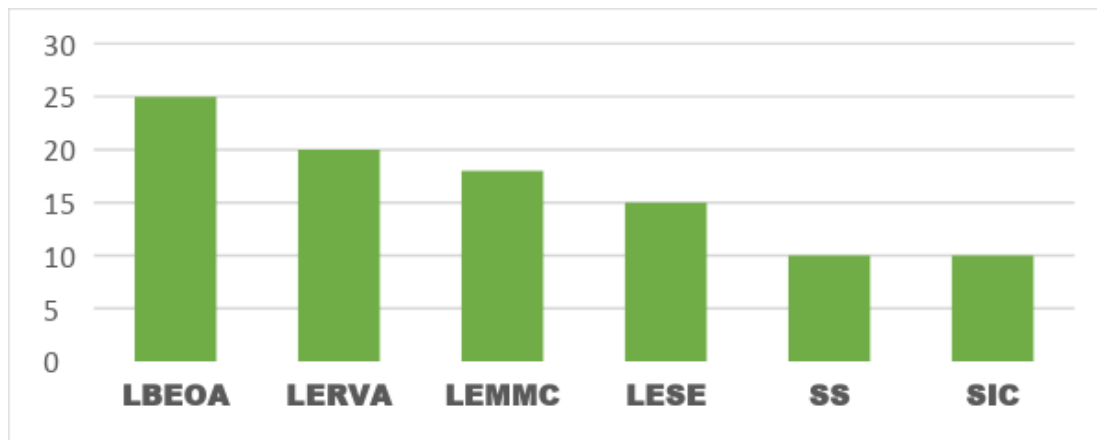


Figure 2. Contribution to the training and improvements of researchers by institutions.

The services enabled several IMROP scientists to finish their training courses. 18% of respondents say they used the services to do their doctoral training. 39% claim to have used the services they have been able to do their masters training, 23 to use the services as part of their degree-level training and 5% used the services to train in DEUG. IMROP scientists to complete their training as part of self-study also used the services.

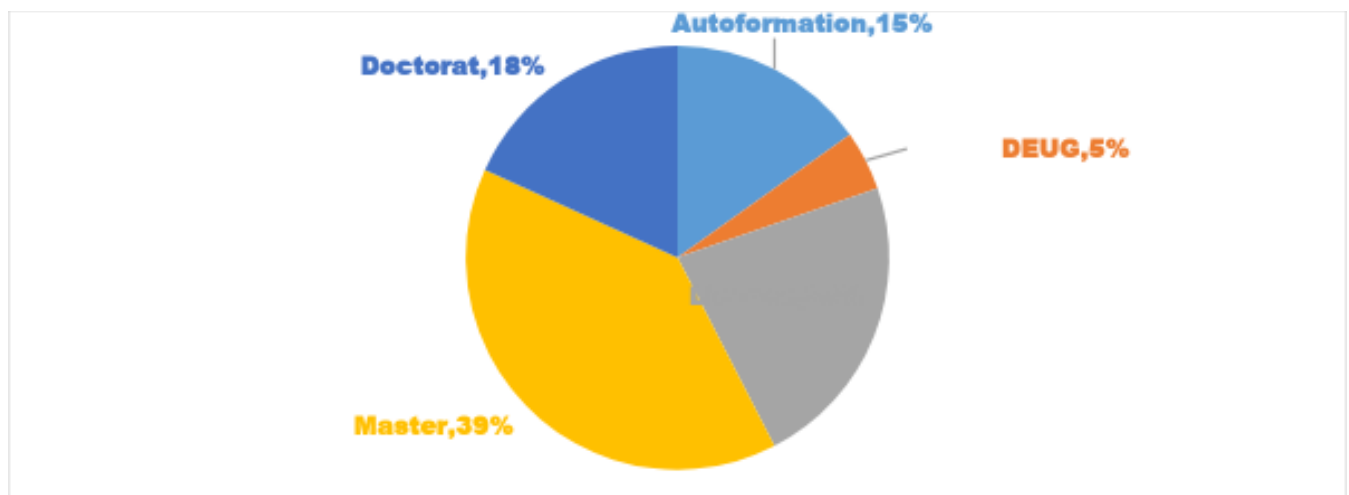


Figure 3. Contribution to the training and improvements of researchers.

### Contribution to Scientific Production

The questionnaire also revealed that IMROP researchers are using the services developed under the Odinafrica project. 30% of the services provided provided technical advice on fisheries management and fisheries management, 25% of them claim to use available resource materials to repair technical reports, to prepare technical reports. 15% of researchers say they have used documentary resources in the writing of scientific articles, 20% of researchers say they have produced scientific posters using data

from the Odinafrica project and 10% for conference papers. 34% of them said they were satisfied with the services developed under the Odinafrica project, 20% are moderately satisfied and 9% seem not to be satisfied with the services developed or have never used the services. Overall, the Odinafrica project is recognized by most of the interviewees as a project that has provided researchers with important information in oceanographers, marine scientists and fisheries. His information was very much involved in carrying out research action at IMROP.

However, the analysis also shows that many researchers seem to be unaware of the diversity of sources of information available in the project. Some also for technical reasons including access to broadband internet could not take advantage of these sources of information.

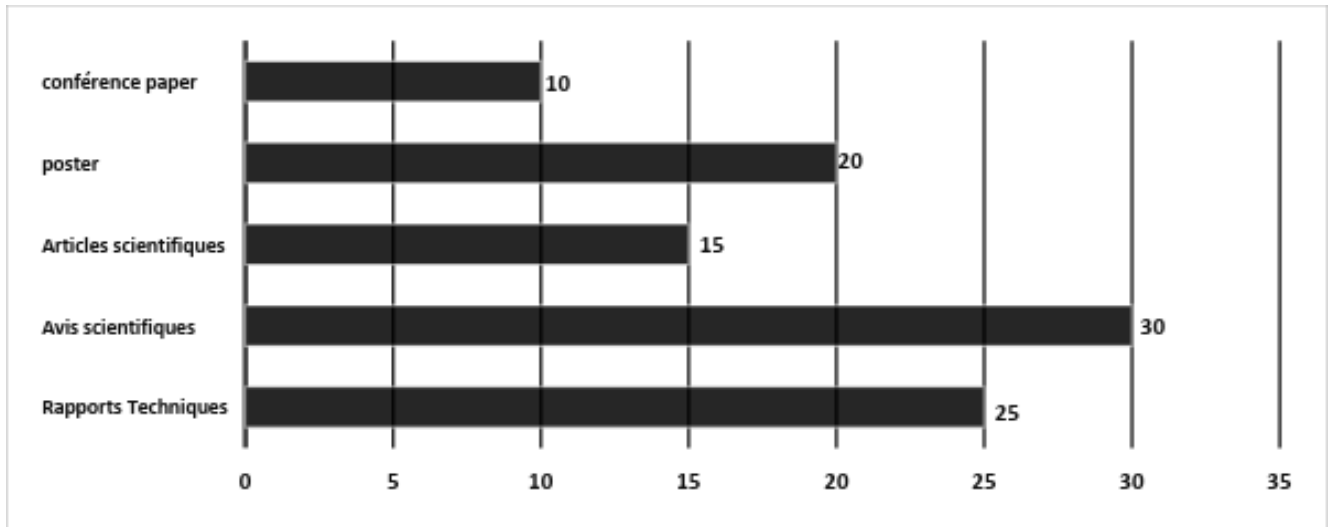


Figure 4. Contribution to scientific production.

### Conclusion

The ODINAFRICA project has participated extensively in the development of oceanographic research and fisheries in West Africa and mainly in Mauritania by setting up a library, provision of scientific information, giving grant of scientific equipment (computers, tide gauges, etc.), training of scientists and the development of oceanographic research in West Africa.

Some obstacles have been identified which constitute obstacles to the use of the documentary resources produced by the Odinafrica project. We can notice some obstacles for researchers to take advantage of the various services offered by the project through IODE. Many researchers also do not know very well the services offered. The Data and information managers involve in the Odinafrica project have a lot of outreach work to do to inform them of the possibilities offered and the available documentary resources to enable researchers to benefit from them in the course of their research.