



**TOGETHER**  
*for a sustainable future*

## OCCASION

This publication has been made available to the public on the occasion of the 50<sup>th</sup> anniversary of the United Nations Industrial Development Organisation.



**TOGETHER**  
*for a sustainable future*

## DISCLAIMER

This document has been produced without formal United Nations editing. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as “developed”, “industrialized” and “developing” are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO.

## FAIR USE POLICY

Any part of this publication may be quoted and referenced for educational and research purposes without additional permission from UNIDO. However, those who make use of quoting and referencing this publication are requested to follow the Fair Use Policy of giving due credit to UNIDO.

## CONTACT

Please contact [publications@unido.org](mailto:publications@unido.org) for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at [www.unido.org](http://www.unido.org)

16670

UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION

Distr.  
LIMITED  
IO.12 (SPEC.)  
5 February 1988  
ENGLISH

---

**WORKSHOP ON SMALL-SCALE BOATBUILDING  
AND BOATREPAIR TECHNOLOGY FOR THE SELECTED  
WEST AFRICAN COUNTRIES**

**ACCRA, GHANA  
30 November - 5 December 1987\***

Final report\*\*

Prepared by the  
Engineering Industries Branch  
Department of Industrial Operations

279

---

\*Organized by the United Nations Industrial Development Organization in  
co-operation with the Government of Ghana

\*\*This document has been reproduced without formal editing.

## PREFACE

The Second General Conference of the United Nations Industrial Development Organization (UNIDO), held at Lima, Peru in March 1975 called for the creation of national, regional and interregional enterprises in maritime transport, an activity based on the shipbuilding and shiprepair industry. Accordingly, the technical assistance of UNIDO to the developing countries includes this engineering activity.

In carrying out the Lima mandate UNIDO has convened 5 experts group meetings for Mediterranean, Latin American and Caribbean, Asian and Pacific, East African and West African countries. Participants of the above-mentioned meetings came from developing as well as developed countries, shipyards, port authorities, technical universities, maritime research institutes and representatives of the Government.

Twenty-seven technical assistance projects in the field of maritime transport equipment have been rendered by UNIDO.

CONTENTS

<u>Chapter</u>	<u>Paragraphs</u>	<u>Page</u>
INTRODUCTION.....	1	4
I. RECOMMENDATIONS.....	2-3	5
II. ORGANIZATION OF THE WORKSHOP.....	4-9	6
III. TECHNICAL SESSIONS.....	10-20	7
IV. SUMMARY OF COUNTRY PAPERS.....	21-28	8
V. LIST OF PARTICIPANTS.....	29-33	11

### INTRODUCTION

1. The Workshop on small-scale boatbuilding and boatrepair technology for the selected West African countries was held at Accra, Ghana from 30 November to 5 December 1987 under the auspices of the United Nations Industrial Development Organization (UNIDO) in co-operation with the Government of Ghana and the Ghana Industrial Holding Corporation (GIHOC). The aims of the Workshop were:

- to exchange know-how and experience in the boatbuilding and boatrepair technology;
- to review boatbuilding and boatrepair facilities in the region;
- to discuss problems of maintenance and repair of boats;
- to consider up-to-date techniques and specific methods for the design and construction of fishing and passenger boats;
- to develop a regional mechanism for promoting co-operation among developing countries in the region.

The Workshop was attended by 17 participants from 8 countries. Two plenary and five technical sessions were held during the Workshops, and visits were made to traditional boatyard and modern shipyard at Tema, Ghana.

## I. RECOMMENDATIONS

### 2. The Meeting adopted the following recommendations:

#### a) Manpower development

To request UNIDO to conduct a manpower survey in all countries of the sub-region to ascertain manpower needs, availability of training facilities and training requirements with a view to drafting an action plan including the possible need of a regional UNIDO Training Centre.

#### b) Regional Co-operation

- 1) To form a Regional Association of shipbuilders and shiprepairers encompassing the small and large scale sectors of the maritime engineering industry with the assistance of UNIDO. This Association would meet annually in the first instance and once in two years thereafter.
- 2) In pursuance of the above each country to form a National Association from which delegates would be nominated to the Regional Association.
- 3) The date and place of the venue for the inaugural meeting of the Regional Association under UNIDO sponsorship were decided by the participants: Douala, Cameroon, November 1988.
- 4) The Interim Secretariat of the Association of shipbuilders and shiprepairers of the West and Central African countries is situated at Douala, Cameroon, under the Interim Secretary General, Mr. Zacchaeus Mungwe Forjindam, N.A.

#### c) Marketing and facility survey in the region

To be included in the UNIDO sponsored manpower survey mentioned in recommendation (a).

#### d) The Application of Computer

UNIDO assistance to introduce computer application in boatyards and shipyards of the region is needed.

#### e) The dug-out canoe

Giving particular attention to the request of the PNDC Secretary for Industry Science and Technology of the Government of Ghana, the session discussed this issue at length and recommends the following:

- 1) Due to the uneconomical use of wooden resources to manufacture a dug-out canoe with outboard motor, it is recommended to replace it by a planked boat with an in board diesel engine.

- 2) In order to encourage traditional users to adopt the new type, the Governments in the region should take necessary measures which may include subsidies to users buying the boats or boatbuilders building them.
3. The meeting requested UNIDO to sponsor follow up meeting in this field in co-operation with the newly established Association of Shipbuilders and Shiprepairers of West and Central African Countries. It also requested UNIDO to reproduce and distribute the final report of the Workshop to all participants and all countries in the region.

## II. ORGANIZATION OF THE WORKSHOP

### 4. Statement by the Technical Director of GIHOC

The meeting was welcomed by Dr. Blukoo Allotey, the National Co-ordinator, who is the Technical Director of Ghana Industrial Holding Corporation. In his statement he expressed his appreciation to UNIDO for organizing this important workshop in Africa. Different meetings, seminars and workshops have been convened in the developed countries, away from the real problems faced by the developing countries. Boatbuilding and boatrepair industry in this region should be upgraded and strengthened since goods and food supply depend on this sector. However, in view of the limited technology, infrastructural facilities and financial resources, he signaled that co-operation among participating countries in the sub-region with assistance from the industrialized countries and UNIDO was essential.

### 5. Statement of UNIDO Representative

A representative of UNIDO thanked the Government of Ghana for hosting the meeting and welcomed the participants. The United Nations Convention on the Law of the Sea, he noted, had played an important role in focusing the interest of many developing countries in exploiting marine resources. He made a short analysis of the tendencies of world shipbuilding development and drew the participants attention to restructuring processes which influence existing shipbuilding potential.

### 6. Inaugural address of the Minister of Industry, Science and Technology

The Workshop was officially opened by Dr. Francis Acquah, PNDC Secretary for Industry, Science and Technology of the Government of Ghana. The Minister, in his inaugural address stressed the importance of boatbuilding and boatrepair activity in connection with the efforts to overcome hunger, to improve transportation of goods and services and to develop national economics. Improved technology in boatbuilding and boatrepair, cost reduction, foreign exchange savings in building and repairing boats locally, creation of additional job opportunities and utilization of available local materials are major areas of concern to African developing countries. Another problem area is with standardization of specifications for boatbuilding to ensure their safety, and the standardization of the marine engines used in the region to minimize spare parts problems, foreign exchange outflow and to reduce demands on training of skills for various marine engines. He pointed

out that the development in this sector should be less capital intensive and should not be depending solely on imported machinery. Local universities and technical institutions should be drawn into a programme for training the manpower resources for the boatbuilding and boatrepair industry. Since boatbuilding depends largely on timber, the Minister requested the meeting to recommend the way to economize the use of wood resource in order not to create ecological problems. In conclusion he thanked UNIDO for organizing the workshop and Ghana Industrial Holding corporation which was serving as the national coordinator.

7. The workshop was steered by the following officers:

Dr. J.A. Blukoo Allotey (Ghana)	Plenary Chairman
Mr. S.D. Abayah (Ghana)	Chairman of Technical Session I + V
Mr. Z. Mungwe Forjindam (Cameroon)	Chairman of Technical Session II
Mr. E.B. Davis (Liberia)	Chairman of Technical Session III
Mr. Jonas Gamba (Gabon)	Chairman of Technical Session IV
Mr. A. Ragunathan (UK)	Rapporteur

8. The following Agenda was adopted:

- a) Opening ceremony of the workshop
- b) Appointment of officers
- c) Approval of agenda
- d) Presentation of issues on the following:
  - Present position, major trends and specific problems of boatbuilding and boatrepair in West African countries
  - Production technology and utilization of locally available construction materials
  - Ways of co-operation at regional level and manpower training.
- e) Visits to GIHOC wooden boatyard and Tema shipyard
- f) Briefing talk on technical co-operation
- g) Conclusions and recommendations
- h) Adoption of the report of the workshop
- i) Closing ceremony

9. Adoption of the workshop report. The final report of the Workshop, including the recommendations, was unanimously adopted at the last plenary session on 4 December 1987.

### III. TECHNICAL SESSIONS

10. Technical papers, oral and written statements were presented and discussed during the technical sessions by the participants and observers on the following subjects:



- a) The present position, major trends and specific problems of boatbuilding and boatrepair in the West African countries
- b) Production technology and utilization of locally available construction materials
- c) Manpower training and ways of co-operation at regional level.

11. The technical discussions focused on the common difficulties encountered by participating countries in boatbuilding and boatrepair industry. The degree of problems vary from country to country.

12. West African countries faced similar problems in boatbuilding and boatrepair industry, due to lack of qualified technicians, managerial skills, upgraded know-how, appropriate equipment, financial resources, adequate business base and its infrastructure.

13. The meeting touched upon the need to reverse the trend of West African countries repairing their ships in Europe and to use facilities available in the region, to help realizing ECDC and TCDC activities.

14. Regional co-operation in the field of boatbuilding and boatrepair industry was initiated by establishing an Association of Shipbuilders and Repairers of West African countries with a view to strengthening their self-reliance in maritime transport.

15. Training and upgrading of technical skill on boatbuilding and boatrepair in this region should be increased with assistance from UNIDO, UN Agencies and developed countries

16. The Government of each country of the region should be made aware of the need to facilitate the development of this crucial industry with appropriate policies and direct involvement in such enterprises.

17. The ancillary industry should be developed in West African countries.

18. Initiative should be made on the standardization of design and equipment for boats/ships, since it would help economic production and thus assist in the development programmes.

19. UNIDO and UN agencies assistance in this field is most required.

20. The meeting requested UNIDO to organize another meeting in this field.

#### IV. COUNTRY PAPERS

##### 21. Benin

A brief presentation of the population, economy and domestic products of the country. Apart from various fishing boats, Benin possesses one cargo ship, which is used to transport agricultural products for export to Europe and capital goods from Europe to Africa. This ship is under the authority of Compagnie Benenoise de Navigation Maritime (COBENAM), which is a joint venture of Benin 51% and Algeria 49%. The company is also running a drydock which needs rehabilitation. The operation of this drydock depends on spare parts supply from Europe.

Co-operation among West African countries is highly needed. UNIDO technical assistance in drydock rehabilitation and upgrading of technical staff is required.

## 22. Cameroon

The paper gives an account of the country profile, historical ship repair industry, existing facilities, problems facing this industry caused by a.o. heavy organization, low productivity, lack of adequately trained staff, capital investment and rationalization.

Perspectives for the future shows that a joint venture project "Cameroon Shipyard and Heavy Industries" is currently under construction in the Douala Port Complex. The objectives of the project are construction and repair of ships, offshore equipment and containers.

The paper concluded with recommendations to establish co-operation between African yards encompassing:

- exchange of design information
- exchange of technical know-how
- specialization of shipyards to meet specific market
- exchange of information on availability and utilization of local materials
- exchange of market information
- promotion of sound competition
- standardization of vessels.

## 23. Gabon

Gabonese boatbuilding and boatrepair is in its initial stage. There are two boatyards serving for the construction, maintenance and repair of steel and plastic boats. Aware of the prominent position of maritime transport industry the Government is undertaking various policy measures to upgrade this field of activity. Close co-operation with Ivory Coast, Morocco and Senegal is being initiated.

Due to low activities in boat construction and repair the boatyards have started products diversification e.g. by producing steel construction, tanks and boilers.

## 24. Ghana

The paper gives a brief historic review of the traditional boatbuilding using available local timber Iroko/Odum and Opepe/Kusia. Since the introduction of planked vessels with inboard marine engines, there has been a phenomenal increase in fish landings made by the fishermen in the country to help meeting the dietary requirements of the people; the neighbouring countries and abroad. Worldwide economic crisis has not spared the boatbuilding industry. Escalation in price of raw materials and marine engines has discouraged new investors and as a result orders for new boats are slow in coming.

Diversification exercise has been introduced. It encompasses furniture construction and construction of yachts. The GIHOC boatyard has the potential of being a good foreign exchange earner and the company has indeed done a lot of export business to Nigeria, U.K., U.S., Canada, Ireland, etc.

#### 25. Liberia

Liberia possesses 5 major ports, but no repair facilities are available in this country, because the only shiprepair yard in Liberia has collapsed 7 years ago. Repair has to be carried out in Ivory Coast. Plan is being elaborated to rehabilitate the dockyard; mode of financing has still to be sought. UNIDO technical assistance utilizing Ghana experience is highly needed.

#### 26. Sierra Leone

Traditional boat used in this country is dug-out canoe made of cotton tree, which is easily to be dug-out and is quicker to give out moisture. Plank construction was introduced afterwards. There are three types of plank boats build in Sierra Leone: round bilge, hard chine and flat bottom. In 1966 a government boatyard started its operation, in 1984 EEC and FAO came into the country to help improve the standard of boatbuilding. Improved Ghana wooden boat design for inboard engines is being introduced. The boats are mainly used for fish catching.

#### 27. Togo

The Societe Togolaise de Navigation Maritime (SOTONAM) is operating two ships of 12,000 dwt each. The ships were built in Germany in 1977. Maintenance and repair are carried out both in Germany or in Lome depending on the grade of damage.

SONOTAM is also managing two ports and one drydock.

UNIDO assistance is required to train technical staff.

#### 28. United Kingdom

The paper outlines a manpower development for shipyards in developing countries. Training strategy should be tailored to the need of the endusers, i.e. shipyards, dockyards and repairshops. Short term strategy is usually adopted for quick mobilization of the shipyard while long term one is for development of substantial skill resources to permit career development of staff.

**V. LIST OF PARTICIPANTS**

**29. Participants**

<b>Mr. Camille Medegan Benin</b>	<b>Chef Service, Direction Armement et Technique (DAT)</b>	<b>COBENAM B.P. 2032, Cotonou Benin Telex: 5225, 5230 Tel: 31 33 30; 31 32 87 31 24 86</b>
<b>Mr. Zacchaeus Mungwe Forjindam Cameroon</b>	<b>Manager Equipment and Shipyard Division</b>	<b>Cameroon National Port Authority P.O. Box 4020 Douala, Cameroon Telex: 5270 KN Tel: 42 01 33; 42 15 60</b>
<b>Mr. Jonas Gamba Gabon</b>	<b>Chef Service et Armement a la SONATRAM</b>	<b>Societe National de Transport Maritime B.P. 3841 Libreville Gabon Tel: 74 06 31; 74 06 32</b>
<b>Mr. S.D. Abayah Ghana</b>	<b>Technical Manager</b>	<b>GIHOC Boatyard Co. Ltd. P.O. Box 235 Tema Ghana Telex: 2109 Tel: 2961</b>
<b>Mr. Charles K. Erzuah Ghana</b>	<b>General Manager</b>	<b>- do -</b>
<b>Mr. Francis Ohene Nyarko Ghana</b>	<b>Engineering Superin- tendent Marine Installations</b>	<b>- do -</b>
<b>Mr. David A. Larteh Ghana</b>	<b>Promotion Manager</b>	<b>- do -</b>
<b>Mr. Timothy K. Agbemasu Ghana</b>	<b>Managing Director</b>	<b>Voltage Boatbuilding P.O. Box B/314 Tema Ghana</b>
<b>Mr. Frank Agyekusa Ghana</b>	<b>Managing Director</b>	<b>Wooden Boats and Yachts P.O. Box 4198 Accra, Ghana Telex: AFDATA 2346 Tel: 71 23 62</b>

Mr. Samuel Donkor Ghana	Marine Engineer	Ranson Boatbuilding Co. P.O. Box 0973 Osu-Accra Ghana
Mr. Eric W. Tonks Ghana	Chairman	Winneba Shipyards Ltd. P.O. Box 8499 Accra, Ghana Telex: 2084 GH Tel: 22 96 39
Mrs. Hannah G. Woanyah Ghana	Deputy Chief Industrial Promotion	Ministry of Industry, Science and Technology P.O. Box M.39 Accra, Ghana
Mr. A.A. Akanteyam Ghana	Ship Surveyor Division of Shipping and Navigation	Ministry of Transport and Communications P.O. Box M.38 Accra, Ghana
Mr. E.B. Davis Liberia	Chief Liberia National Coast Guard	Ministry of National Defense Monrovia Liberia, WCA
Mr. Christian Quinn Sierra Leone	Boatbuilder M.A.N.R., Fisheries Division	5c, Peterson Street Freetown Sierra Leone
Mr. Kpandja Oukpane Togo	Mechanical Engineer	SOTONAM B.P. 4086 Lome, Togo
Mr. A. Ragunathan UK	Naval Architect	A + P Appledore Northumbrian Way Killingwoth New Castle Upon Tyne NE 12 0BH England Telex: 537 33 6 Apatec G. Tel: 26 82 149

**30. Government of Ghana**

<b>Dr. Francis Acquah</b>	<b>Minister PNDC Secretary</b>	<b>Ministry of Industry Science and Technology P.O. Box M. 39 Accra, Ghana</b>
<b>Dr. Ikba Ata</b>	<b>Technical Director</b>	<b>- do -</b>
<b>Ms. Rebecca Amoah</b>	<b>Assistant Secretary</b>	<b>- do -</b>
<b>Mr. A.K. Amega</b>	<b>Assistance Secretary</b>	<b>- do -</b>
<b>Mrs. Alice Attuah</b>	<b>Principal Industrial Promotion Officer</b>	<b>- do -</b>
<b>Mr. S.Y. Bortsi</b>	<b>Principal Industrial Promotion Officer</b>	<b>- do -</b>
<b>Mr. James K. Appiah</b>	<b>Principal Industrial Promotion Officer</b>	<b>- do -</b>
<b>Mrs. H.G. Woanyah</b>	<b>Deputy Chief Industrial Promotion Officer</b>	<b>- do -</b>
<b>Mr. Koti Prah</b>	<b>Principal Executive Officer</b>	<b>- do -</b>
<b>Mr. Adu Frimpong</b>	<b>Senior Industrial Promotion Officer</b>	<b>- do -</b>
<b>Mr. J. Adasi</b>	<b>Industrial Promotion Officer</b>	<b>- do -</b>
<b>Mr. A. Agbodbo</b>	<b>Industrial Promotion Officer</b>	<b>- do -</b>
<b>Mr. Kwame Fosu</b>	<b>Assistant Industrial Promotion Officer</b>	<b>- do -</b>
<b>Mr. S.N.D. Nartey</b>	<b>Assistant Industrial Promotion Officer</b>	<b>- do -</b>
<b>Mr. D.A. Aggrey</b>	<b>Assistant Industrial Promotion Officer</b>	<b>- do -</b>
<b>Mr. K.A.I. Nuhu</b>	<b>Assistant Industrial Promotion Officer</b>	<b>- do -</b>

31. UN Agencies

Ms. A. Forrester	UNDP Resident Representative	UNDP P.O. Box 1423 Accra, Ghana
Mr. E. Ossinga	FAO Regional Fisheries Officer	FAO Regional Office P.O. Box 1628 Accra, Ghana
Mr. E. Sharapov	Industrial Officer	UNIDO P.O. Box 300 A-1400 Vienna Austria
Mr. P. Prijapratama	Programme Officer	UNIDO P.O. Box 300 A-1400 Vienna Austria
Mr. E. Taylor	UNIDO Chief Technical Adviser	MIST P.O. Box M.39 Accra, Ghana
Mr. S.E. Joseph	UNIDO Expert	MIST P.O. Box M.39 Accra, Ghana
32. <u>Observers</u>		
Mr. A.A. Melomey	Deputy Production Manager	Tema Shipyard and Drydock P.O. Box 454 Tema, Ghana
Mr. Alíred Howusu	Union Chairman	GIHOC Boatyard P.O. Box 235 Tema, Ghana
Mr. R.A. Taylor	Union Secretary	GIHOC Boatyard P.O. Box 235 Tema, Ghana
Mr. Kwasi Abeasi	Executive Secretary Development and Application of Intermediate Technology	DAPIT Secretariat P.O. Box M402 Accra, Ghana
Mr. G. Angyandah	Information Officer	Information Service Department P.O. Box 245 Accra, Ghana

**33. Organizers**

<b>Mr. J.E. Kwamina Moses</b>	<b>Executive Chairman</b>	<b>GIHOC Head Office P.O. Box 2784 Accra, Ghana Telex: 2109 Tel: 66 52 74</b>
<b>Dr. J.A. Blukoo-Allotey</b>	<b>Technical Director</b>	<b>- do -</b>
<b>Mr. K. Osei Bimpong</b>	<b>Public Relations Manager</b>	<b>-do -</b>
<b>Mr. Alex Anderson</b>	<b>Transport Officer</b>	<b>Ministry of Industry, Science and Technology P.O. Box M.39 Accra, Ghana</b>
<b>Mr. Damier Odamtteh</b>	<b>Assistant Transport Officer</b>	<b>- do -</b>