

## Appendices

## Appendices

### Appendix 1. Member list of the Study Team

#### (1) On the Basic Design Study

Name	Position	Affiliation
Mr. Shin MARUO	Sub-leader / Coordinator	Rural Development Team, Project Management Group III, Grant Aid Management Department, JICA
Mr. Masami TSUCHIYA	Project Manager / Fisheries Products Distribution Survey	Overseas Agro-Fisheries Consultants Co., Ltd.
Mr. Wataru IWASAKI	Architectural and Facilities Planning / Natural Condition Survey	
Mr. Toru TACHIKI	Construction Planning / Cost Estimation	
Mr. Nobuo ITOI	Equipment and Procurement Planning / Cost Estimation	
Mr. Ryo ISHIMOTO	Operation and Management Planning / Environmental and Social Consideration	

#### (2) On the Explanation of the Draft Basic Design Study

Name	Position	Affiliation
Mr. Shin MARUO	Leader / Coordinator	Senior Program Officer Rural Development Team, Project Management Group III, Grant Aid Management Department, JICA
Mr. Masami TSUCHIYA	Project Manager / Fisheries Products Distribution Survey	Overseas Agro-Fisheries Consultants Co., Ltd.
Mr. Wataru IWASAKI	Architectural and Facilities Planning / Natural Condition Survey	

## Appendix2 Study Schedule

### 2-1 Basic Design Study

Day no.	M/D	day	Content of the Study		
			JICA	Consultants ①, ②, ⑤	Consultants③, ④
1	7/30	Mon.	Departure from Narita to Paris→Arrival in Paris.		
2	7/31	Tus.	Departure from Paris→Arrival in Dakar.		
3	8/1	Wed.	Departure from Dakar→Arrival in Banjul.		
4	8/2	Thr.	Courtesy call to FD, explanation of IC/R. ⑤Departure from Narita to Paris→Arrival in Paris		
5	8/3	Fri.	Discussion with FD, Preparation of boring and topographic survey. ⑤Departure from Paris→Arrival in Dakar.		
6	8/4	Str.	Fish distribution survey, ⑤Departure from Dakar→Arrival in Banjul.		
7	8/5	Sun.	Project site survey and visit to fish landing place.		
8	8/6	Mon.	Discussion with FD for filed survey, arrangement of boring and topographic survey.		Departure from Narita → Arrival in Paris.
9	8/7	Tus.	Courtesy call to BAC and WR. Discussion with Market operation committee.		Departure from Paris → Arrival in Dakar.
10	8/8	Wed.	Discussion with FD about social environment consideration, Courtesy call to NEA and GAMWORKS.		Procurement survey in Dakar.
11	8/9	Thr.	Discussion with FD about project components. Commencement of boring and topographic survey.		Departure from Dakar → Arrival in Banjul.
12	8/10	Fri.	Discussion with FD about dimension of the project components. Commencement of fish distribution survey. Water and electricity supply survey.		
13	8/11	Str.	Confirmation of project site boarder line with BAC. Ice supply and fish delivery survey.		
14	8/12	Sun.	Team meeting, hearing from ice making plant.		
15	8/13	Mon.	Courtesy call to permanent secretary of DSFD. Preparation for stakeholder meeting, hearing from ice making plant.		
16	8/14	Tus.	Stakeholder meeting at WR.		
17	8/15	Wed.	Fish distribution survey in Gunjur and western region area.		
18	8/16	Thr.	Fish distribution survey in Tanji and western region area.		
19	8/17	Fri.	Departure from Narita Paris, Departure from Paris to Dakar.	Discussion with BAC about operation and alternative land.	
20	8/18	Str.	Departure from Dakar to Banjul, team meeting.	Team meeting	
21	8/19	Sun.	Confirmation of the project site and fish landing place, project progress meeting.	Fisheries distribution survey (project site, fish landing site).	
22	8/20	Mon.	Courtesy call to FD, DSFW, MOFA, DSTE.	①②Ditto、③Construction survey, ④Mechanical facility survey ⑤ Discussion with NEA.	
23	8/21	Tus.	Courtesy call to BAC.	①②⑤Ditto、③Construction survey, ④Mechanical facility survey.	
24	8/22	Wed.	Team meeting and preparation of minutes of discussion.	①②⑤Ditto、③Construction survey, ④Mechanical facility survey.	
25	8/23	Thr.	Discussion about minutes of meeting with FD and BAC.	①②⑤Ditto、③④procurement and construction survey.	
26	8/24	Fri.	Sign of minutes of discussion.	①Ditto、②③④⑤Stakeholder meeting at WR.	

			Stakeholder meeting at WR. Stakeholder meeting at WR.	
27	8/25	Str.	Team meeting	Team meeting
28	8/26	Sun.	Departure from Banjul→Arrival in Dakar.	① Ditto, sorting out of documents.      ③ ④ Departure from Banjul → Arrival in Dakar.
29	8/27	Mon.	Reporting to JICA Senegal office and Embassy of Japan. Departure to Paris→	① Ditto、② ⑤ Discussion with FD.      ③④ Procurement survey in Dakar. Departure from Dakar→
30	8/28	Tus.	Arrival in Paris, Departure to Narita→	① Procurement survey in Dakar, ②⑤ Discussion with FD      Arrival in Paris, Departure to Narita →
31	8/29	Wed.	Arrival in Narita.	① Procurement survey in Dakar, ② ⑤ Departure from Banjul→Arrival in Dakar.      Arrival in Narita.
32	8/30	Thr.		①②⑤ Procurement survey in Dakar. Departure from Dakar→
33	8/31	Fri.		Arrival in Paris, Departure to Narita→
34	9/1	Str.		Arrival in Narita.

① Project Manager / Fisheries Products Distribution Survey, ② Architectural and Facilities Planning / Natural Condition Survey, ③ Construction Planning / Cost Estimation, ④ Equipment and Procurement Planning / Cost Estimation, ⑤ Operation and Management Planning / Environmental and Social Consideration.

FD: Fisheries Department, WR: Western Region, DSFD: Department of States for Fisheries, DSFW: Department of States for Fisheries and Water Resources, EFAD: External and Foreign Affairs Department, DSTE: Department of State for Trade, Industry and Employment

## 2-2 Explanation of the Draft Basic Design Study

Day no.	M/D	day	Content of the Study	
			JICA	Consultants ①, ②,
1	2/22	Fri		Narita→Paris, Paris→Dakar
2	2/23	Str.		Dakar→Banjul
3	2/24	Sun	Narita→Paris	Survey of Brikama Market.
4	2/25	Mon.	Paris→Dakar, Dakar→Banjul	Explain of Draft Basic Design report.
5	2/26	Tus.	Discussion with BAC (Explain to Draft Basic Design report) . Discussion about M/M with FD and BAC.	Ditto
6	2/27	Wed.	Discussion about M/M with FD. Courtesy call to Department of State for Fisheries. Discussion with NEA. Signing of Minutes of Discussion.	Ditto
7	2/28	Thr	Banjul→Dakar	①Ditto, ②Explain to Physical planning section BAC,
8	2/29	Fri	Reporting to JICA Senegal and Embassy of Japan. Departure from Dakar→	①Ditto, ②Banjul→Dakar. Departure from Dakar→
9	3/1	Str	Arrival in Paris, Departure to Narita→	
10	3/2	Sun	Arrival in Narita.	

### **Appendix3 List of Parties Concerned in the Recipient Country**

#### Department of State for Fisheries and Water Resources

Mr. Laminw Nyabally	Permanent Secretary(DBD stage)
Mr. Mamodou A. Cham	Permanent Secretary(BD stage)

#### Fisheries Department

Mr. Adiatou Njai	Director
Mr. Nfamara J. Dampha	Assistant Director
Mr. Osuman Mass Jobe	Head of Fisheries Extension
Mr. Peter J. Ndow	Project Coordinator

#### Brikama Area Council

Mr. Sunkary Badjie	Mayor (DBD stage)
Mr. Ousman Gaye	Mayor(BD stage)
Mr. Mamadou Jallow	C. E. O. (DBD stage)
Mr. B. M. Cham	C. E. O. (BD stage)
Mr. Momodou Cham	Director of Finance
Mr. Masanneh Badjie	Development Office
Mr. Sering Modou Joof	Public Translation Office

#### Development & Planning Department

Ms. Adama Bojang	Acting Director,
Mr. Massanneh Badjie	Development & Planning Officer
Mr. Mamudou Manjang	Physical Planning Officer
Mr. Fasallcoy Janneh	Technician

#### Cleaning Service Department

Mr. Abdoulie M. C. Touray	Manager
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#### Western Region

Mr. Abdou F.M. Badjie	Governor of the Western Region
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#### Brikama Market

Mr. Bunjering Jadama	Market Manager
Mr. Essa Chum	Market deputy Manager
Mr. Momodou Saine	Vice President (Brikama Retailers Association)

National Environment Agency (N.E.A.)

Mr. Momodou B. Sarr	Executive Director
Mr. Mustapha Jallon	Senior Programme officer
Ms. Nancy Njie	Senior Programme Officer
Mr. Momodou Jama Suwareh	Senior Programme Officer
Mr. Malic Bah	Programme officer

Department of State for Health and Social Welfare

Mr. Omar B Njie	Assistant Director
Mr. Awa Sanyang	Programme officer

Department of State for Local Government and Land

Mr. Gitteh Kalilu	Principal Physical Planning Officer
Mr. Senghore Camara	
Mr. Ansumana	

Department of State for Trade, Industry & Employment

Mrs. Fatima Mabury Njie	Principal Economist
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Brikama Health Centre / Public Health Inspector's office

Mr. Abdou Jalta	Public Health officer
Ms. Ausa Sanyang	Public Health officer

NAWEC(National Water & Electricity Company)

Mr. Ebrima C. Sanyang	Electric Engineer
Mr. Mustapha Sillah	Water supply Engineer

Gambia Port Authority

Mr. Moustapher L Marong	Director
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GAMWORKS

Mr. Ebrima Cham	Director General
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Tanji Fisheries Centre

Mr. Baboucarr Sarr	Manager
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Mr. Yusfa Assistant Fisheries Officer

Gunjur Fisheries Centre

Mr. Ebima Kunta Manager

Mr. Janko Ceesay Principal Fishery Assistant

Embassy of Japan in Senegal

Seiichi Higuchi First Secretary

Hiroki Sugiyama Second Secretary

Japan International Cooperation Agency Senegal Office

Eizen Irei Resident Representative

Takemichi Shirai Representative

Motoharu Wakabayashi Assistant Resident Representative

Koich Kato Assistant Resident Representative

## Appendix 4 Minutes of Discussion (M/D)

### 4-1 Basic design study (M/D)

MINUTES OF DISCUSSIONS  
ON THE BASIC DESIGN STUDY  
ON THE PROJECT FOR CONSTRUCTION OF BRIKAMA FISH MARKET  
IN THE REPUBLIC OF THE GAMBIA

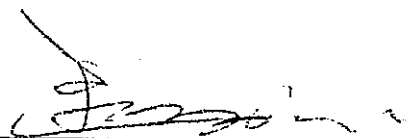
Based on the results of the Preliminary Study, the Government of Japan decided to conduct a Basic Design Study on the Project for Construction of Brikama Fish Market (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").


JICA sent to the Republic of the Gambia (hereinafter referred to as "the Gambia") the Basic Design Study Team (hereinafter referred to as "the Team"), which is managed by Mr. Satoru Hagiwara, Group Director, Project Management Group III, Grant Aid Management Department, JICA, and headed by Mr. Shin Maruo, and is scheduled to stay in the Gambia from 1<sup>st</sup> August 2007 to 29<sup>th</sup> August 2007.

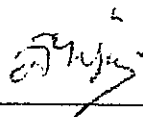
The Team held discussions with the officials concerned of the Gambia and conducted a field survey at the study area.

As a result of discussions and field survey, both parties confirmed the main items described on the attached sheets.

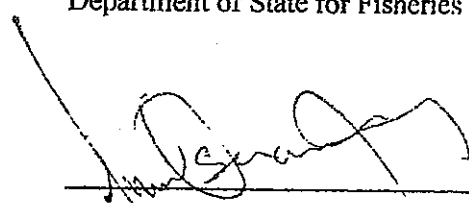
Banjul, 24<sup>th</sup> August, 2007



 Satoru Hagiwara  
Leader  
Basic Design Study Team  
Japan International Cooperation Agency



Adiatou Njai  
Director of Fisheries  
Department of State for Fisheries and Water Resources



Osumar Gaye  
Mayor  
Brikama Area Council, Western Region



## ATTACHMENT

### 1. Title of the Project

The title of the Project is "the Project for Construction of Brikama Fish Market".

### 2. Objective of the Project

The objectives of the Project is to establish the effective distribution network of fresh fish in Brikama area through improving hygienic and sanitary condition of fish market to reduce post harvest losses, satisfying the demand of consumers for fresh fish, and increasing and stabilizing the income of retailers, wholesalers and fishfolks.

### 3. Project Site

The site of the Project is located in Brikama Area, Kombo Central District and specific Project site is finally determined as shown in ANNEX-I.

### 4. Responsible and Implementing Agency

4-1. The Responsible Agency is the Department of State for Fisheries and Water Resources.

4-2. The Implementing Agency is the Fisheries Department, the Department of State for Fisheries and Water Resources in cooperation with Brikama Area Council.

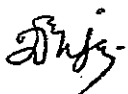
### 5. Items requested by the Government of the Gambia

Based on the priority confirmed between the Government of the Gambia and the Preliminary Study Team, both sides made discussions and the items listed in ANNEX-II were finally requested by the Gambian side. The Gambian side insisted on the necessity to have a double cabin pickup to facilitate fish distribution. The Team explained that only the items indispensable for the Project were included as the Project components.

The Team explained that JICA will assess the appropriateness of the request after further study and analysis, and will recommend to the Government of Japan for approval.

### 6. Japan's Grant Aid Scheme

The Gambian side understood the Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of the Gambia as explained by the Team and described on the Minutes of Discussions signed by the Preliminary Study Team and the Government of the Gambia on 9<sup>th</sup> February, 2007.



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## 7. Schedule of the Study

7-1. The consultant members will proceed to further works in the Gambia till 29<sup>th</sup> August, 2007.

7-2. JICA will prepare the draft report in English and dispatch a mission in order to explain its contents in January, 2008.

7-3. In case that the contents of the report is accepted in principle by the Government of the Gambia, JICA will complete the final report and send it to the Government of the Gambia by the end of March, 2008.

## 8. Other relevant issues

### 8-1. Operation and Management of Brikama Fish Market

The Gambian side presented the organization chart for operation and management of Brikama Fish Market attached as ANNEX-III. The Gambian side explained that the organization for operation and management of Brikama Fish Market would be established prior to the completion of the Project based on a schedule attached as ANNEX-IV.

The Gambian side confirmed that Fisheries Department and Brikama Area Council would jointly take responsibility for the operation and management of Brikama Fish Market, including financial support for the initial stage of operation and in cases of current-account deficit.

### 8-2. Procedure for Relocation of Existing Retailers

A certain number of canteen owner and vendors (hereinafter referred to as "the retailers") in Brikama Market are required to relocate to the areas as described in ANNEX-V for the implementation of the Project. The Team explained that appropriate measures should be taken for the relocation such as arrangement of meetings to gain understanding of the retailers.

The Gambian side held explanation session for the retailers and other related stakeholders on outline of the Project and procedures for the relocation on 14<sup>th</sup> August, 2007 in collaboration with the Team. Besides, a follow-up stakeholder meeting is planned to be held on 24<sup>th</sup> August, 2007. The Gambian side promised to have further explanation session(s) for gaining better understanding and agreement on the relocation and to send the result(s) attached with the agreement of the retailers in the Project site to JICA Senegal Office by the end of October, 2007.

### 8-3. Removal of Existing Facilities

The Gambian side agreed to remove the existing facilities and clear the land with its own expenses prior to the announcement of tender on the Project and inform the result to JICA Senegal Office promptly.

#### 8-4. Basic Infrastructure Preparation

The Gambian side agreed to provide basic infrastructure such as electricity, water supply, etc. to the Project site with its own expense before the completion of construction works of the Project, while those infrastructure inside the Project site would be provided by the grant aid.

#### 8-5. Permissions Necessary for the Project

The Gambian side agreed to get permissions necessary for the Project from the organizations concerned prior to the construction works. The Gambian side explained that they would be applied based on detailed design of the Project.

#### 8-6. Environmental Impact Assessment (EIA)

The Gambian side explained specific procedure for EIA in accordance with laws and regulations of the Gambia. The Gambian side explained schedule for getting permission of EIA as ANNEX-VI, and promised to get the permission and inform the result to JICA Senegal Office by the end of March, 2008.

END

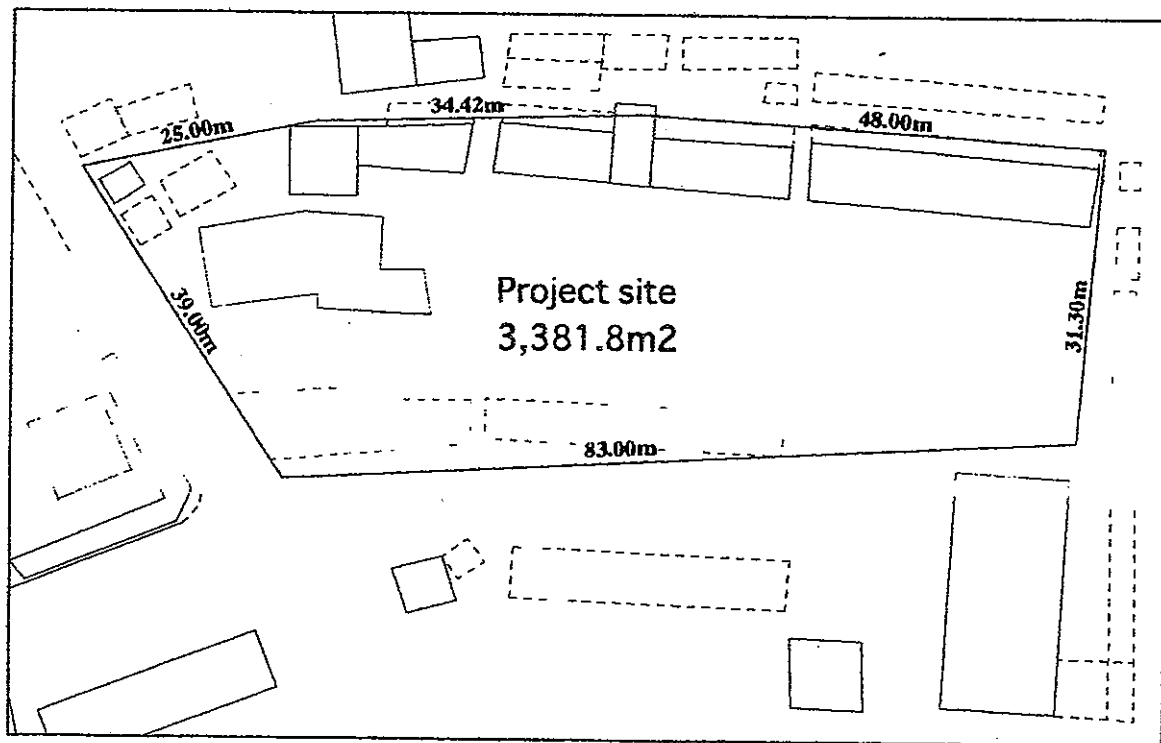
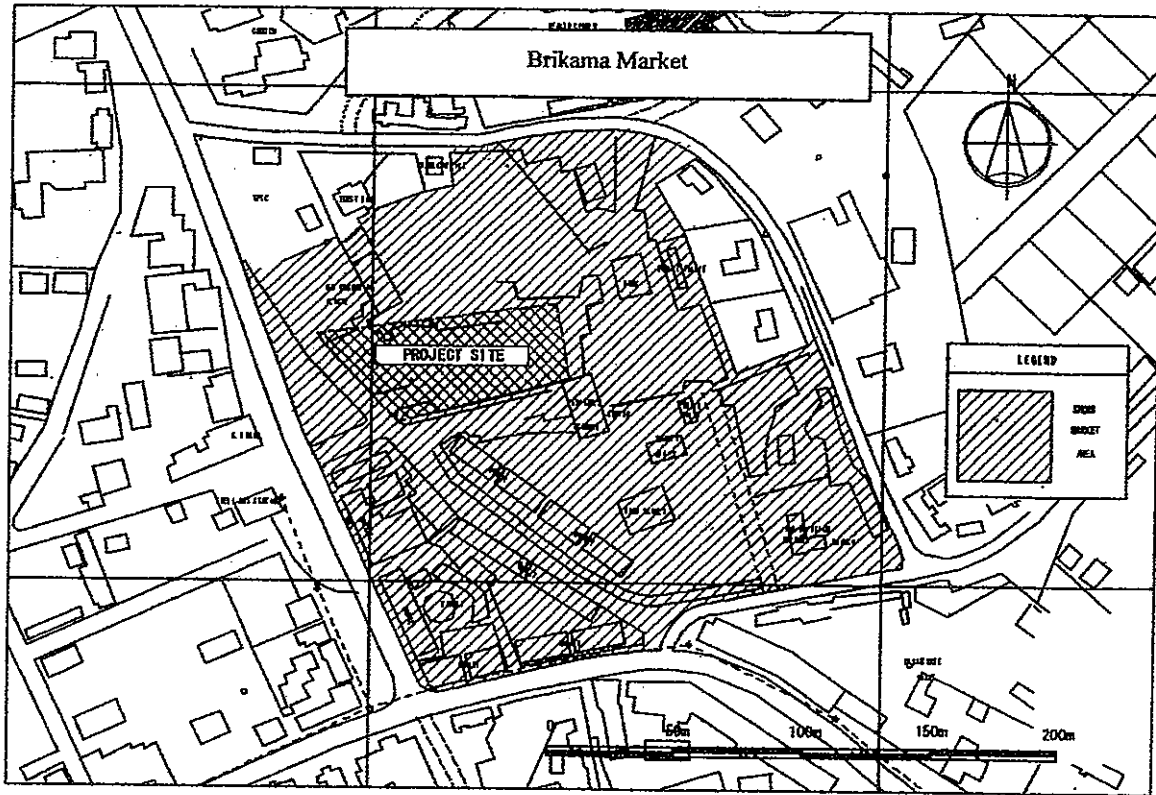
- ANNEX-I Location of the Project Site
- II Items Requested by the Gambian Side
- III Planned Organization Chart for Operation and Management
- IV Establishment Schedule of Operation and Management Organization
- V Planned Relocation Site for Retailers in the Project Site
- VI Schedule for Getting Permissions of EIA

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Location of the Project Site

ANNEX-I



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Items Requested by the Gambian Side are as follows;

Market Hall Building with Office Space  
Fish Handling Yard  
Ice Making Machine / Ice Storage  
Fish Storage: Cold Room / Cooler Boxes  
Generator / Gas Oil Tank  
Septic Tank  
Water Supplying System  
Toilet and Shower  
Handling Equipment: Fish Trays, Balances  
Consulting Services for Operation and Management of Facilities  
Double Cabin Pickup

Items excluded from the requests are as follows;

Office Equipment: PC, Printer  
Handling Equipment: Trolley

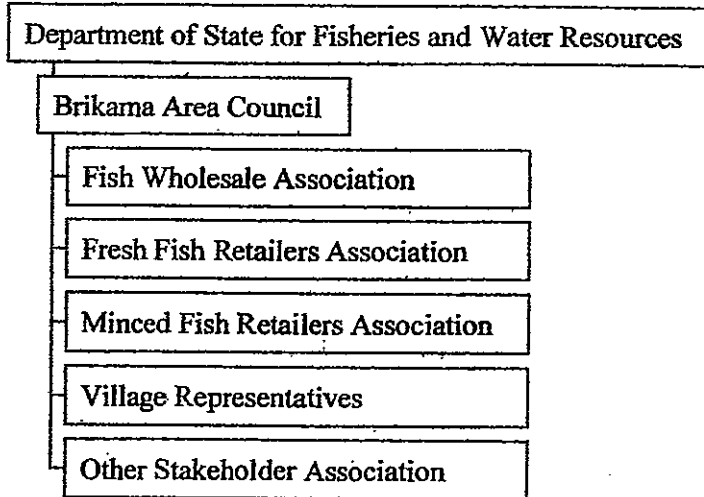


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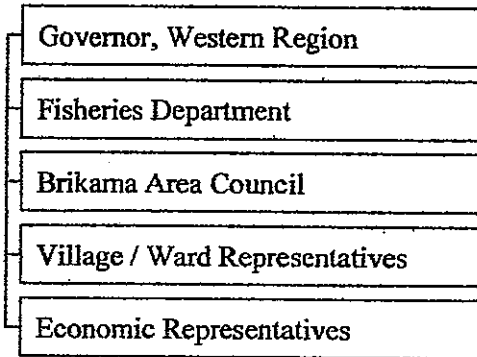


Planned Organization Chart for Operation and Management

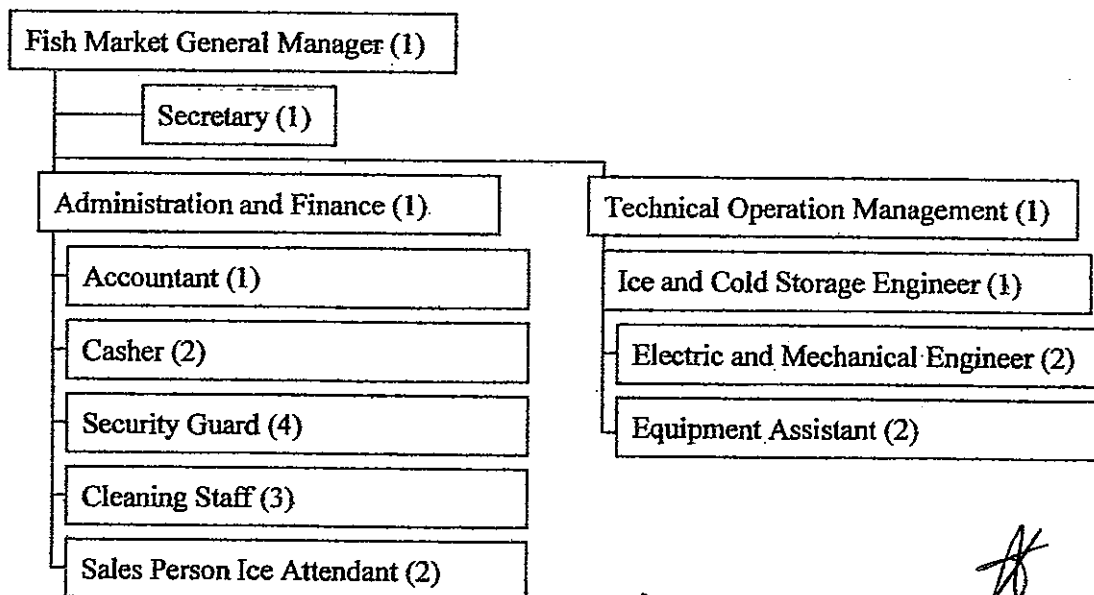
Fish Market Organization Diagram



Sub-management Committee



Fish Market Management Committee



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Establishment Schedule of Operation and Management Organization

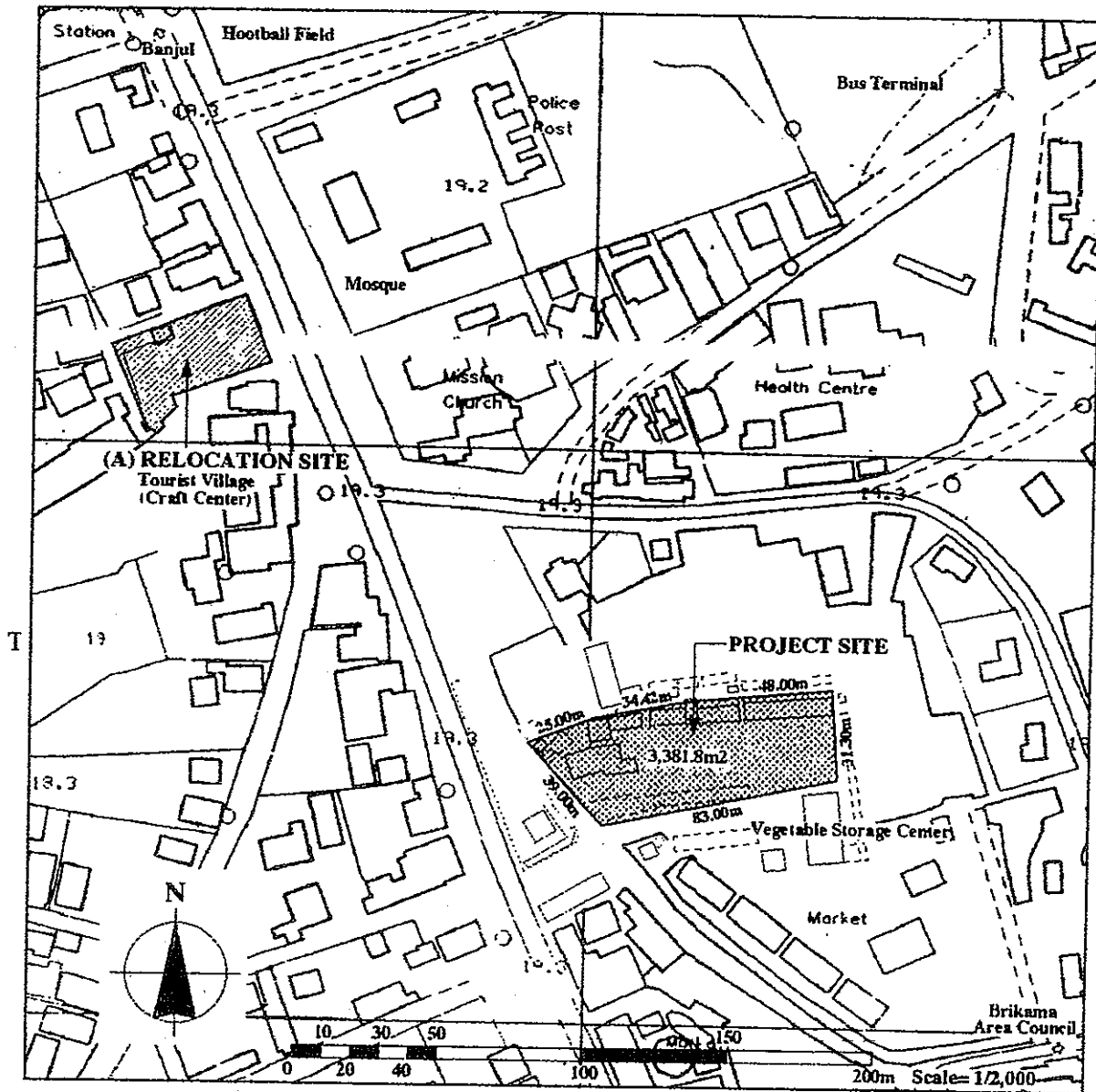
Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
<b>Works</b>																						
Approval by the Cabinet of Japan		▲																				
E/N			▲																			
Detailed Design & Tender Documents				□																		
Preparation for Tender					▬																	
Tendering & Evaluation								▬														
Construction										▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬	▬
Completion																						▲
<b>Organization Establishment Schedule</b>																						
Organization of Central Management Committee and Sub-Management Committee								▬														
Employment of Fish Market General Manager, Administration & Finance Manager, and Technical Operation Manager								▬														
Employment of Ice and Cold Storage Attendants, Electrical and Mechanical Attendants														▬								
Recruitment/Employment of Accountant, Cashiers, Security Guards, Cleaning Staffs, Sales Person / Ice Attendants, Equipment Assistants, Secretary																						▬

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Planned Relocation Site for Retailers in the Project Site



The areas for relocation are (A) and other spaces within the existing market area.

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Schedule for Getting Permissions of EIA

Schedule	Study Process	EIA Process	Fisheries Department
2007	August	Consultant field survey in the Gambia Inception Report	Preparation and submission of Environmental Assessment form to NEA
	September	Analysis and preparation of Draft report in Japan	Submission of EIA Screening Form
	October		Full EIA Require (Class A)
	November		Environmental Approval Granted Class B and C
	December		Inform the result of "Screening" to JICA Senegal Office
2008	January	Explanation of Draft report in the Gambia	Inform the result of "Environmental Approval Granted" to JICA Senegal Office.
	February		
	March	Submission of Final Report	Environmental Approval Granted

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4-2 Basic design study explanation study

MINUTES OF DISCUSSIONS  
ON BASIC DESIGN STUDY  
ON THE PROJECT FOR CONSTRUCTION OF BRIKAMA FISH MARKET  
IN THE REPUBLIC OF THE GAMBIA  
(EXPLANATION ON DRAFT REPORT)

In August 2007, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a Basic Design Study Team on the Project for Construction of Brikama Fish Market (hereinafter referred to as "the Project") to the Republic of the Gambia (hereinafter referred to as "the Gambia"), and through discussion, field survey, and technical examination of its results in Japan, JICA prepared a draft report of the study.

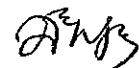
In order to explain and to consult the Government of the Gambia on the components of the draft report, JICA sent to the Gambia the Draft Report Explanation Team (hereinafter referred to as "the Team"), which is headed by Mr. Shin Maruo, Senior Program Officer, Rural Development Team, Project Management Group III, Grant Aid Management Department, JICA and is scheduled to stay in the Gambia from 23<sup>rd</sup> February 2008 to 29<sup>th</sup> February 2008.

As a result of discussions, both parties confirmed the main items described on the attached sheets.

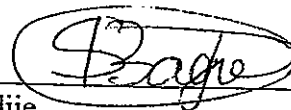
Banjul, 27<sup>th</sup> February 2008



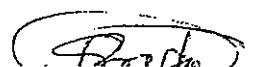
Shin Maruo  
Leader  
Draft Report Explanation Team  
Japan International Cooperation Agency



Adiatou Njai  
**DIRECTOR OF FISHERIES**  
Director of Fisheries  
Department of State for Fisheries, Water Resources  
and National Assembly Matters



Sunkary Badjie  
Mayor  
Brikama Area Council, Western Region



## ATTACHMENT

### 1. Components of the Draft Report

The Gambian side agreed and accepted in principle the components of the draft report explained by the Team including obligations of the recipient country, which are mentioned in Chapter 3 of the draft report.

### 2. Japan's Grant Aid scheme

The Gambian side understood the Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of the Gambia as explained by the Preliminary Study Team on the Project.

### 3. Schedule of the Study

JICA will complete the final report in accordance with the confirmed items and send it to the Government of the Gambia by April 2008.


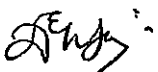
### 4. Confidentiality of the Project

#### 4.1. Detailed specifications of the Facilities and Equipment

Both sides confirmed that all information related to the Project including detailed drawings and specification of the facilities and equipment and other technical information shall not be released to any outside parties before the signing of all the Contracts for the Project.

#### 4.2. Confidentiality of the Project Cost Estimation

The Team explained the cost estimation of the Project as described in ANNEX-I. Both sides agreed that the Project Cost Estimation should never be duplicated or released to any outside parties before signing of all the Contracts for the Project. The Gambian side understood that the Project Cost Estimation attached as ANNEX-I was not final and was subject to change.



## 5. Other relevant issues

### 5.1. Agreement of the Retailers in the Project Site on Relocation

The Gambian side explained that explanation sessions on relocation had been held on 26<sup>th</sup> and 27<sup>th</sup> November 2007 after the follow-up stakeholder meeting held on 24<sup>th</sup> August, 2007 in collaboration with the Basic Design Study Team. As a result of the sessions, the retailers in the Project site agreed on the relocation and signed on the Agreement Letter as ANNEX-II. The Gambian side explained that three month notice would be given to the retailers in the Project site on relocation to the alternative site.

### 5.2. Removal of Existing Facilities

The Gambian side promised to remove the existing facilities in the Project site and clear the land of the site at its own expenses prior to the announcement of tender of the Project and report the result to JICA Senegal Office promptly.

The Team explained that delay of the removal works could result in delay of the Project implementation and the Gambian side understood the explanation by the Team.

The Gambian side explained that the budget for removal of existing facilities and clearing of the land would be secured by Fisheries Department.

### 5.3. Basic Infrastructure Preparation

The Gambian side promised to provide basic infrastructure to the Project site at its own expenses before the completion of construction works of the Project. The Gambian side explained that budget for provision of basic infrastructure would be secured by Fisheries Department.

### 5.4. Operational Cost of Brikama Fish Market

The Gambian side promised to bear operational cost of the initial stage and to make up a deficit. The Gambian side explained that budget would be secured by Fisheries Department.

### 5.5. Renewal of Ice Making Machine and Ice Storage

The Team strongly requested to accumulate minimum 10% of income from monthly ice sales to separate account for the replacement of ice making machine and ice storage after their service life. The Gambian side understood and promised to follow the request from the Team.

## 5.6. Environmental Impact Assessment (EIA)

The Gambian side promised to obtain permission of EIA and inform the result to JICA Senegal Office by the end of March, 2008.

The Team explained that delay of obtaining permission of EIA could result in delay of the Project implementation and the Gambian side understood the explanation by the Team.

## 5.7. Permissions Necessary for the Project

The Gambian side agreed to obtain permissions necessary for the Project from the organization concerned prior to the initiation of construction works and inform to JICA Senegal Office promptly.

## 6. Recommendations

The Team recommended to the Gambian side following items for making the condition of the whole Brikama Market better.

### 6.1. Pavement of the Road in front of the Market

The Team recommended to pave the road on the west and the south line of the Project site for easy access to and improvement of hygienic condition of the Market.

### 6.2. Periodical Cleaning of Drain

Both sides recognized that the existing drainage system around Brikama Market wasn't functioned fully. For improvement of the market condition, the Team recommended to clean the drainage around the market regularly.

### 6.3. Separate Collection of Wastes

The Team recommended to collect fisheries products waste separately to keep the market clean and to utilize wastes. The fish waste can be recycled to fertilizer, feedstuff and so on.

END

ANNEX-I Project Cost Estimation

ANNEX-II Agreement of Retailers in the Project Site on Relocation

THE REPUBLIC



OF THE GAMBIA

Fisheries Department  
6 Marina Parade  
Banjul.

Ref: Ref: FD\69\77\Vol.VIII (4)

26<sup>th</sup> November 2007

**AGREEMENT FOR RELOCATION OF RETAILERS FROM PROPOSED  
BRIKAMA FISH MARKET TO AN ALTERNATIVE SITE**

Reference to minutes of discussions signed between the Fisheries Department, Brikama Area Council and JICA on the 24<sup>th</sup> August 2007 in connection to relocation of the retailers at the proposed fish market by the Brikama Area Council.

We the retailers (vendors and canteen owners) hereby agreed that we would voluntarily move to the site allocated to us by Brikama Area Council without reservations.

We also agreed that the place we are presently occupying is property of the Gambia Government and the Brikama Area Council gave it to us temporarily.

That we will be given three months notice to enable us start-erecting structures to the alternative site if there is any structure to be erected.

1	Abdoulie Mbe	Center	Li
2	Mamad Mbe	Center	For [Signature]
3	Hadiy Jorja	Center	[Signature]
4	Muhammad Toul	Center	For [Signature]
5	Sunee, Sanyoga	Center	[Signature]
6	Muhammad Sadi Mbe	Center	For [Signature]
7	Muhammad Jello	Center	
8	Abdoulie Mbe	Center	For [Signature]
9	Ebrulime Sobi	Center	[Signature]
10	Sankou Bitchilly	Center	[Signature]
11	Sheriff Abd. Jello	Center	[Signature]
12	Yusuf Mbe	Center	For [Signature]
13	Enli Mbe	Center	[Signature]
14	Nyaga Mbe	Center	
15	Subagallo, Jus Mbe	Center	For [Signature]
16	Sakaria Reh	Center	For [Signature]
17	Rube Sobe	Center	[Signature]
18	Mamad Sany Jorja	Center	[Signature]
19	Lamin Jorja	Center	[Signature]
20	Jorja Jorja	Center	[Signature]
21	Mamad Sany Jorja	Center	For [Signature]
22	Mamad Sany Jorja	Center	[Signature]

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23	Mariahou Senghore	Canteen	For <del>SP</del>
24	Lamin Conteh	Canteen	For <del>SP</del>
25	Sheiff Sarge	Canteen	<del>SP</del>
26	kebbe Manned	Canteen	<del>SP</del>
27	Mets Bayer	Canteen	<del>SP</del>
28	Sarjo Camara	Canteen	<del>SP</del>
29	Tubango Jabang Abdou Sampe	Canteen	<del>SP</del>
30	Boima Beh	Canteen	<del>SP</del>
31	Mariam Bayang	Canteen	For <del>SP</del>
32	Sulayman Jarin	Canteen	<del>SP</del>
33	Morro Sannel	Canteen	<del>SP</del>
34	Damba	Canteen	<del>SP</del>
35	Abassay Jarin	Canteen	<del>SP</del>
36	Abdoulie Jarbi	Canteen	<del>SP</del>
37	Sanneben Chen	Table	<del>SP</del>
38	Lamin Camara	Canteen	<del>SP</del>
39	Cherno Sowe	Canteen	<del>SP</del>
40	Kutubo Conteh Ibra Njie	Canteen	For <del>SP</del>
41	Yussepha Jallow	Canteen	<del>SP</del>
42	Moussa Lo Moussa Ceedy	Canteen	For M Sijie
43	Lamin Ceedy	Canteen	<del>SP</del>
44	Hassan barboe	Canteen	<del>SP</del>

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45	Buba Mannel	Canteen	De
46	Sanda Mbye	Canteen	Fr
48	Dembe Chen	Canteen	
49	Ameday S. Bannal	Canteen	
50	Almagie Bel	Canteen	
50	Baba Jobe	Canteen	R Jobe
51	Kebea Barrow	Canteen	Fr
52	Moday Mannel	Canteen	
53	Santa Njie Contal	Canteen	
54	Mamuday Jaturka	Canteen	
55	Foku Fofors	Canteen	
56	Abdullie Jery	Canteen	
57	Katim Beh	Canteen	
58	Amie Bojang	Table	
59	Binta Fari	Canteen	Fr
60	Fatimata Famba	Table	
61	Chime Cassay	Table	
62	Jaba Mboob	Table	Fr
63	Alien Jellow	Table	
64	Amie Gai	Table	
65	Lany Camar	Table	Fr
66	Assan Jellow	Table	

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No	Name	Position	Signature
67	Ebrima Bah	Canteen	for [Signature]
68	Jamou Kefera	Canteen	[Signature]
69	Abdoulie Dukereh	Canteen	[Signature]
70	Sheikh Karbo	Canteen	[Signature]
71	Sheriff Barry	Canteen	[Signature]
72	NJagga Jammeh	Canteen	for [Signature]
73	Mahmoud Bah	Canteen	for [Signature]
74	Yankuba manka	Canteen	[Signature]
75	Yorro Jallow	Canteen	[Signature]
76	Mamina Jeng	Canteen	[Signature]
77	Juenda Sallah	Canteen	for [Signature]
78	LAWRENCE H.	Table	[Signature]
79	Abou Keita	Canteen	[Signature]
80	Nyarra Sanneh	Canteen	[Signature]
81	Munirou Samateh	Canteen	for [Signature]
82	Abdoul Jallow	Canteen	[Signature]
83	momodou yorro Jalloh	Canteen	[Signature]
84	Abdoulie Jallow	Canteen	[Signature]
85	Muhammed Gassama	Canteen	[Signature]
86	Yankuba Kanteh	Canteen	for [Signature]
87			

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131	Ebrima Bumbuya	Canteen	for <del>24</del>
132	pap. Jagne	Canteen	Joo
133	ASSAN FaaI	Canteen	<del>for</del>
134	modou Loum	Canteen	<del>for</del>
135	TiJan Jallow	Canteen	<del>for</del>
136	Naba manneh	Canteen	
137	Salayman Gicis	Canteen	<del>for</del>
138	Abdoulie Ben	Table	<del>for</del>
139	Abou Nyang		<del>for</del>
140	Yussepha Brommel	Canteen	<del>for</del>
141	mariana kankallou	Canteen	<del>for</del>
142	Essa Touray	Canteen	<del>for</del>
143	Aliou Jallow	Canteen	<del>for</del>
144	Binta Sanneh	Table	<del>for</del>
142	nomodou oustas Jallow	Canteen	<del>for</del>
143	Seedy Kyfabi	Canteen	<del>for</del>
144	Abdoulie Saing	Canteen	<del>for</del>
145	Abdou Joof	Canteen	<del>for</del>
146	Kalidou Jobe	Canteen	<del>for</del>
147	Sata mbye	Canteen	<del>for</del>
148	Kaba Jaitah	Canteen	<del>for</del>
149	Ali mbye	Canteen	<del>for</del>

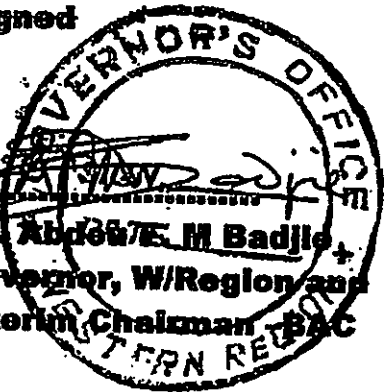
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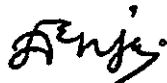
150	Bella boun	Canteen	<del>for</del>
151	Madou Daphy	Canteen	<del>for</del>
152	Hana Sillah	Canteen	<del>for</del>
153	Kenneth okay	Canteen	okay
154	Mba Njie Feyai	Canteen	<del>for</del>
155	Harwa Jatta	Canteen	<del>for</del>
156	<del>Mariam</del> Harwa Ceesay	Canteen	<del>for</del>
157	Faton Suwaneh	Canteen	<del>for</del>
158	Nganda Khan	Canteen	<del>for</del>
159	Haruna churgan	Canteen	<del>for</del>
160	Ebrima Sameh	Canteen	<del>for</del>
161	Awa Jahateh	Canteen	<del>for</del>
162	Momodou Boye Jallow	Canteen	<del>for</del>
163	Njasaay Sarr	Canteen	<del>for</del>
164	Faton Ceesay	Canteen	<del>for</del>
165	Nyima Jarjusey	Canteen	<del>for</del>
166	Momodou Ebo Jallow	Canteen	<del>for</del>
167	Cherno Hydara	Canteen	<del>for</del>
168	Satang Dumbuya	Canteen	for detail
169	Amadou Jallow	Canteen	<del>for</del>
170	Momodou Salieu Jallow	Canteen	<del>for</del>
171	Mustapha Joof	Canteen	<del>for</del>

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Signed

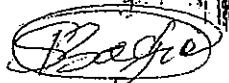

  
 .....
   
 Mr. Abdou M Badjie
   
 Governor, W/Region and
   
 Interim Chairman BAC

Signed


  
 .....
   
 Adiatou Njal
   
 Director of Fisheries
   
 DIRECTOR OF FISHERIES

*Adiatou Njal*

*AB*



## 5. Soft Component (Technical Assistance) Plan

### 1. Background

The Gambia is located in the west end of the African Continent and one of the smallest countries in Africa. The country is basically a river valley and estuary cutting into Senegal over a distance of 324 km and total area of 10,689 km<sup>2</sup>. Gambia river flow into the ocean, supplying nutrient salts from inland to the coastal zone which dominate by 3,800 km<sup>2</sup> of continental shelves. Such favourable natural conditions enhance the productivity of the ocean and sea animals and pelagic fish. It is estimated that 75% of the population and 20% in GDP ratio is engaged in primary industries such as artisanal fisheries, subsistence farming, livestock rearing and the production of groundnuts and cereals.

The artisanal fisheries sector employs a working population of approximately 6,000 which are vital sector providing employment opportunities in regional area and supplies an animal protein to the nation mainly by “Bonga” fish. This artisanal fishery mainly exploits pelagic fish using gillnets to catch Bonga and sardinella. The artisanal fishery is mainly directed at the coastal pelagic species and the demersal resources represent only 30% of landings from the artisanal sector. However, in the artisanal fisheries sector, there are shortages of infrastructure such as fishing equipments, supply (distribution) systems, storages and sales facilities which resulting to increase of Post-Harvest Losses (PHL: estimated to 25-30% of marketed fresh fish). This post-harvest loss is causing deduction of their income and nutrient source for the people. Fish products are a highly perishable food, requiring proper handling, processing and distribution, if it is not to utilize in a cost effective and efficient manner.

The most of market in the Gambia has originally started from spontaneous assembly of a small type of shops. The Brikama Fish Market, which will construct by the Project, would be the first modernized market in this region. In the past decade, Fisheries Department had been gaining knowledge on management and implementation of three Fisheries Centres (Gunjur, Tanji and Bakau), which situate on major fish landing sites in the artisanal coastal to improve reduction of PHL with collaboration of the Japan’s Grant aid.

Brikama district (population: 390,000) is located to access point to inland economy of the Gambia. High demand of fresh fish is exist from consumers in Brikama district. However fresh fish sold in the market is unpredictable with unreliable conditions causing from lack of practical distributions and capacities in the market. This unacceptable environment causes increase of PHL. The object of the project is to construct fish market and install equipment including ice-making machine to achieve PHL improvement in the Brikama market to stabilize quantity and improve quality of a fresh fish as reliable protein source.

#### Operation and Management

The Brikama Area Council (BAC) manages operation of current Brikama market. BAC collects a space utilization charges from an each retailer and spending those collected finance are pended to only simple maintenance for the market (such as cleaning). The project site is situated

inside of current market and will be constructs as a part of the Brikama Market, though the operation of the fish market is planned to manage separately from current management system. In the project, BAC and Fisheries Department collaborates as partner to establish co-management system called “Central management committee” and “Sub-central management committee” to operate fish market. Members of sub-central management committee are composing with Fisheries Department, BAC, Governor, village representative and the economic representatives who will have responsibility to audit management status.

Operation and management system of fish market facilities (including equipments) will be totally new to the current market system. It is highly required to support in soft component activities for sustainable operation and management. As part of the soft component activity, implementation to support organizing the administrative structure will be made during the initiation stage. In addition, preparation of internal rules of market management and problem solving (trouble shooting) will be studied. And for the maintenance, the soft component activity will support the preparation of “Short term maintenance plan” and “Long-term maintenance plan” to prevent from operation failure. In addition, case study from neighbouring countries (Senegal, Mauritania, Guinea) is planning to be introduced to archive the knowledge of effectiveness or non-effectiveness of the among each management structure. Furthermore, conducting basic training of the account book management will be performing to the accountant of the new fish market to establish secure and transparent fund management. Regarding to the market operation plan, "the market utilization rule" will be prepared with collaboration with the counterpart, which comprehending of the convenience of the retailer. This temporary rules will be tested and modifies by OJT at new market. The fish market is basically planned to be devise with an easy access from outside, and arranged the retailer’s booth with accessible layout. Therefore it is vital to conduct OJT to conduct the filing of the adequate retailer’s booth which corresponding with the planned design.

Equipment maintenance and operation are also important factors for sustainable management. From this reason, preparation of a long-term maintenance plan and training are essential to carry and will be planed to implement by soft component activities. As a result of those activities, reliable and sustainable market managements having transparent accounting system would be expect as outcome.

#### Capacity building of retailer (Market user)

To utilize a founded fish market for more effective with high efficiency manners, capacity building of market users (retailers) are important key factors for success of the project. Most of the fresh fish retailers in the current market understand the necessity of hygienic handling and importance of modern market usage for the fresh fish. However, until now, opportunities of those educations have not been provided. Collaboration with retailer and implementation of following capacity building are indispensable for adequate market operation.

1) Fresh fish handling and Preservation 2) Reduction of PHL 3) Sanitation management Improvement 4) Environmental Issues 5) Business Planning 6) Waste management

Those activities will be conduct by local NGOs, as workshop, under the direction of soft component staffs. Having advantage of communication skill, knowledge of local culture and custom, utilization of local NGO has been preferred for organizing workshops. The selection of local NGO will be based on the service experience with an international donor and acquainted with

for region circumstances. As outcome of those activities, sustainable market managements with practical market utilization manner would be highly expected.

#### Ice making facilities operation and management

Ice plant in Fisheries Centre (Bakau, Tanji and Gunjur) is operated by Fisheries Department. Those facilities are constructed by Japan Grant aid in last decade and produce plate type of ice for fish distribution purpose. Fisheries department has been operating those facilities and accumulated the knowledge of management. In the project, as to store fish, an ice vital for fish market is not plate type, it is planned to install flake type of ice for better heat consumption for products.

The new refrigerant, which abides by treaty of Montreal Protocol are recommended by the NEA. The Protocol banned refrigerants such as R-22, to be phased out of operation in near future. As the international project, even there is limited experience on new refrigerants (R-404a), it is recommended to install to ice plant for this project from environmental reasons.

In spite of above, the management and operation training, handling knowledge are essential for better perception of flake type ice plant for the new fish market. As mentioned above, technician from Fisheries department own knowledge of maintenance and handling on plate type ice plant, but not flake type. For sustainable operation, the training is necessary and long-term operation planning is desirable.

There is limited circumscription to implement necessary training by the engineer from the ice manufacturer during installation.

It is necessary to conduct following contents by the soft component activities for the sustainable ice facilities management after completion of the project.

- A) Operation and training of ice making machine
- B) Ice making machine management plan (a long term & short term)
- C) Maintenance operation of ice making machine
- D) New refrigerant handling training

## 2. Object of soft-component service

Soft-component activities are aiming the facilities and equipment which is provided with in this project to utilize effectively and efficiently maintains as to achieve the following objective.

“Management and Operation of the Brikama fish market is to perform relevantly by market operators”

An operation of the fish market is planned to establish self-support accounting system with management of joint control system, together with BAC, Fisheries Department, and the local community. For sustainable and sufficient management of the fish market, following measure should be achieved and implemented after commence by the Gambia authorities.

- 1) Establish central and sub- committee as a core management organization and clarifies the role of the committee to the market management.
- 2) Equipments and facilities are relevantly and properly operated.
- 3) Retailers comprehend the environment condition that are suitable for handling of the fresh fish, and market are properly utilizes according to the Market rule.

In addition, it is required to prepare the systems, to reflect the opinion or feed back from



retailer to the management authorities of the Fish Market. In this project, comprehensive input to achieve above-mentioned objectives would be prepared in the soft component activities with collaboration of counter parts personnel.

### 3. Output

Following four outputs are expected as output by implementation of Soft-components activities.

Output 1: Establishment of Committee management plan for Central committee and Sub- central committee

Output 2: Facilities and equipments of the fish market are adequately utilized

Output 3: Ice making facilities are adequately managed and properly utilized.

Output 4: Improve of sanitation and environmental condition of the fish market

### 4. Activities

Following activities will be implement to establish output 1 "Establishment of Committee management plan for Central and sub- committee"

Activity 1-1: Clarify the role and responsibilities of central and sub-central committee

Activity 1-2: Prepare the draft of "Committee management plan" with Fisheries Department.

Activity 1-4: Hold stakeholders meeting to hear and discuss the draft of "Committee management plan"

Activity 1-5: Finalize "the committee management plan" based on the result obtained from Actives 1-1 to 1-4.

Following activities will be implement to establish output 2 "Facilities and equipments of the fish market is adequately utilized"

Activity 2-1: Prepare draft plan for "Fish market facilities operation plan" and "Fish market utilization rules"

Activity 2-2: Fact finding of Fish Market operation with the fish market staffs.

Activity 2-3: Confirm the prices setting of retailer's sections and the charge collection method.

Activity 2-4: Determine the methods of balance sheet for fish market and modify if necessary.

Activity 2-5: Implement fee collection methods (Activity 2-3) on the site.

Following activities will be implement to establish output 3 "Ice making facilities are adequately managed and properly utilized."

Activity 3-1: Implement the lecture of the proper refrigeration technique based on installed ice facilities.

Activity 3-2: Implement OJT of refrigeration maintenance methods

Activity 3-3: OJT on the economical operation of ice making facilities

Activity 3-4: Estimation and calculation of annual operation plans and maintenance plans for the ice making facilities.

Activity 3-5: Prepare the manuals for “troubleshooting”, for the case of system breakdown of ice making facilities

Following activities will be implement to establish output 4” Improve of sanitation and environmental condition of the fish market, as the result post-harvest loss would reduce”

Activity 4-1: Organize five workshops for retailer’s capacity building.

Activity 4-2: Prepare the collection and/or disposal of waste rule

Activity 4-3: OJT on fresh fish storage and handling

Activity 4-4: Organize studies for marketing survey

Table below summarize activities of Soft-Component

Support	Current condition	Input	Output
Establishment of Operation and Management systems <i>Organization structures</i>	<ul style="list-style-type: none"> <li>In the market, BAC organizes collection of utilization fee from Retailer.</li> <li>Accountability is not clear for the Market</li> </ul>	<u>Japan:</u> <ul style="list-style-type: none"> <li>Japanese consultant to support organization, management system</li> </ul> <u>The Gambia:</u> <ul style="list-style-type: none"> <li>C/P</li> </ul>	<ul style="list-style-type: none"> <li>Establishment of Co-management system</li> <li>Establishment of proper facilities management system</li> <li>Accountability</li> <li>Proper management will implemented after handling over the facilities</li> <li>The independent accounting system of the fish market will be established.</li> </ul>
<i>Operation managements</i> (Equipments /Facilities)	<ul style="list-style-type: none"> <li>Fresh fish retailer are spread around the market</li> <li>No particular equipments are use</li> </ul>	<u>Japan :</u> <ul style="list-style-type: none"> <li>Japanese consultant to support in the fields of an equipment management, facility management and accounting system</li> </ul> <u>The Gambia :</u> <ul style="list-style-type: none"> <li>C/P</li> </ul>	<ul style="list-style-type: none"> <li>Establish accounting system</li> <li>Equipments (Ice box, fish box, scale) will be properly utilize by retailers</li> <li>Equipments are properly managed</li> <li>Facility utilization fee and an equipment renting charge will be properly collected.</li> <li>Improvement of accessibility</li> <li>Consumer demand will be review by the survey, and to feedback the trend.</li> </ul>
Capacity building of Retailer	<ul style="list-style-type: none"> <li>Most of the retailer have no experience on using the modern type of market.</li> </ul>	<u>Japan:</u> <ul style="list-style-type: none"> <li>Participatory workshop organize by local NGO</li> <li>Utilization rule of Fish market</li> <li>OJT on the study of fresh fish handling</li> </ul> <u>The Gambia:</u> <ul style="list-style-type: none"> <li>C/P</li> </ul>	<ul style="list-style-type: none"> <li>Reducing post harvest loss</li> <li>Improvement of business structure</li> <li>Smooth implementation, soon after the handling over the facility</li> </ul>
Establishment of Ice making facility operations and maintenances	<ul style="list-style-type: none"> <li>Fisheries Department has experience on operation of Plate type of ice machine</li> <li>BAC has lack of abilities to conduct operation of ice machine</li> </ul>	<u>Japan:</u> <ul style="list-style-type: none"> <li>Operation and management training by Japanese consultant. Economical methods of operation will be also implemented at same training.</li> </ul> <u>Gambia:</u> <ul style="list-style-type: none"> <li>C/P (Ice facility staffs)</li> </ul>	<ul style="list-style-type: none"> <li>Sustainable facility management system will be establish</li> <li>Long and mid-term operation plan will be establish.</li> <li>Economical running operation will be established.</li> </ul>

## Input for activities

### *Japan:*

	<u>Input</u>	<u>Duration</u>	<u>Contents of Activity</u>
1)	Fish Market Operation and Management (Japanese consultant)	2.0 M/M	Preparation of textbook, Market Operation training, Bookkeeping, Selection of NGO, Management training, etc.
2)	Ice Making Facilities Operation and Management (Japanese consultant)	1.0 M/M	Operation training Management training and Guidance
3)	Workshop For Fish Retailer (Local NGO)	5 seminar (Workshop style)	Fresh fish handling, Sanitation, Business-planning, etc
4)	Local Interpreter	1 M/M	(Local – English)

### *The Gambia*

1)	Fisheries Department	Counterpart(s)
2)	Fish Market employee	Counterpart(s)

## 6. Implementation Resources

The Capacity building workshop for retailer had been planed to consign to the local NGO from following reasons. 1) Knowledge of local custom, culture 2) Spoken local language 3) Limited time schedule for the project

The consultants and implementing authorities will have discussion for the selection of contractor based on the technical and financial proposal.

Below table shows conditions of the workshop to be carried by the NGO.

<b>Workshop</b>	<b>Participa nts (No.)</b>	<b>Training Duration</b>	<b>TOR</b>	<b>Target Participants</b>	<b>Sign-board for notice</b>
Fish Handling And Preservation	80(40x2)	4 days (2x2)	Post Harvest Operations for Fresh Fish Ice Selection (flake compared to ice blocks)	Fresh fish Retailers	2
Sanitation Management Environmental Issues	40	3 days	Sanitation Program (Harked hygiene), Environmental Issues	Fresh fish Retailers Market Operators	4
Business Planning	20	4 days	Basic business Skill Financial Sustainable Plan	Fresh fish Retailers	2
Waste Management	50	3 days	Waste Reduction	Fresh fish Retailers Market Operators	4
Market Utilization/man agement	60	2 days	Utilization rule on market operations	Fresh fish Retailers Market Operators	4

## 7. Time Schedule of the Soft Component

Below figure summarizes an estimate time schedule for soft-components activities.

Month	0	1	2	3	4	5	6	7	8	9	10	11	
<b>Detailed Design study</b>		←-----▶ (7.0 month)											
Field study		■											
Detailed Design			▬										
Tendering and Contract						▬							
<b>Construction and Procurement</b>		←-----▶ (11.0 month)											
Preparation		▬											
Construction		▬											
Equipment procurement/Shipping/etc.					▬								
Inspection/ Installation											■		
Equipment Test												■	
Delivery												▲	
Completion												*	
<b>Soft-Component</b>			NGO selection, Market management							Market management			
Market operation & management			▬							▬			
Refrigeration techniques											▬		
Workshop				①	②		③	④		⑤			
Interpreter				■							■		

## 8. Obligations of Recipient Country

In the Gambia, the Brikama fish market will be the first Fish-Market that consists with modernizes services. In other words, executing agency, Fisheries Department and Brikama Area Council (BAC), having a little experience of operation and management as regards to this type of market. It would be essential to possess Fisheries Department and BAC to attempt in the implementation of soft-component activities to achieve the following objective.

- Establishment of central committee and sub-central committee.
- To implement market managements according to prepared "Market management plan"
- Preparation of a long-term operation plan.
- Management of market equipments
- Maintenance and a data collection of refrigeration facilities
- A capacity-building of market retailers

However, before the implementation of soft-components activities, the Gambia authorities are strongly required to achieve the market management system and prepare organization staffs and a financial structure for this project. In addition, as a duty of the Gambian authorities, preparation and appoint of the counterpart personal is essential. This counterpart personal must work together with the Japanese staffs to support their activities. And it is necessary to strive his/her best to achieve an above-mentioning objective. In addition, involvements of staff members who will be employed for the Brikama fish market are highly requested to participate all the activities.

## 6. References

### 6-1. Electrical Design documents

Table A-1 Illuminance standard and Design illuminance of each space (unit: lux)

Space	Japanese illuminance design standard by code JIS Z 9110	Illuminance design standard concerning situation of the site facilities	Lighting fixture	Qty	Design illuminance
Market hall A	300~150	150	Water resistant type FL-40W , direct-mounted on raceway	55	144
Market hall B	300~150	150	Water resistant type FL-40W, direct-mounted on raceway	80	145
Market hall C	300~150	150	Water resistant type FL-40W, direct-mounted on raceway	37	131
Fish handling yard	300~150	100	Water resistant type FL-40W, direct-mounted on raceway	24	99
Ice sales cashier booth	750~300	350	Louver type FL-2-40W, direct-mounted (embedded type)	4	332
Fish boxes crew both	750~300	250	Louver type FL-2-40W, direct-mounted (embedded type)	3	249
Space for storing fish boxes	150~75	50	Water resistant type FL-40W, direct-mounted	1	73
Corridor	200~100	50	Water resistant type FL-40W, direct-mounted on raceway	2	59
Staircase	200~100	100	Lower part open end type FL-40W, hanger type	4	116
Manager room	750~300	350	Louver type FL-2-40W, direct-mounted (embedded type)	4	371
Secretary room	750~300	350	Louver type FL-2-40W, direct-mounted (embedded type)	2	294
Drawing room	500~200	250	Louver type FL-2-40W, direct-mounted (embedded type)	2	181
Administration crew room	750~300	350	Louver type FL-2-40W, direct-mounted (embedded type)	4	351
Technical crew room	750~300	350	Louver type FL-2-40W, direct-mounted (embedded type)	4	351
Reference room	300~150	100	Lower part open end type FL-40W, direct-mounted	1	110
Meeting room	500~200	250	Louver type FL-2-40W, direct-mounted (embedded type)	9	237
Toilet (Man) (Female)	150~75	75	Water resistant type FL-40W, direct-mounted	2	99
Shower room	150~75	75	Water resistant type FL-40W, direct-mounted	1	82
Kitchenette	200~100	150	Water resistant type FL-40W, direct-mounted	2	146
Corridor	200~100	50	Lower part open end type FL-40W, hanger type	5	88
Security guard room	300~150	200	Water resistant type FL-2-40W, direct-mounted	4	229
Cleaning crew room	300~150	200	Water resistant type FL-2-40W, direct-mounted	3	215
Pump room	150~75	75	Water resistant type FL-2-40W, direct-mounted	1	65
Emergency generator room	150~75	75	Lower part open end type FL-40W, direct-mounted	1	98
Toilet (Man)	150~75	75	Water resistant type FL-40W, direct-mounted	6	78
Toilet (Female)	150~75	75	Water resistant type FL-40W, direct-mounted	11	74

Table A-2 Receiving Capacity Requirement

Item	Phase	Total power consumption	Power factor conversion rate	Approximate load input	Demand rate	Receiving capacity requirement
Light fixture	Single-phase	12.92KW	1.250	16.15KVA	0.50	8.08 KVA
Outdoor light, floodlight	Single-phase	1.08 KW	1.500	1.62 KVA	0.80	1.30 KVA
General socket facilities	Single-phase	8.40 KW	1.000	8.40 KVA	0.33	2.77 KVA
Hot-water supply system	3-phase	12.00 KW	1.250	15.00 KVA	0.33	4.95 KVA
Air conditioner	3-phase	2.07 KW	1.500	2.58 KVA	0.80	2.07 KVA
Ventilation facilities	Single-phase	1.00 KW	1.333	1.33 KVA	0.90	1.06 KVA
Ice making machines	3-phase	55.00 KW	1.250	62.50 KVA	0.90	56.25 KVA
Chilled room	3-phase	6.00 KW	1.250	3.75 KVA	0.40	2.48 KVA
Pressure pump	3-phase	1.50 KW	1.176	1.76 KVA	0.33	0.58 KVA
Drain pump	3-phase	0.75 KW	1.176	0.88 KVA	0.50	0.44 KVA
Aeration pump	3-phase	3.00 KW	1.176	3.53 KVA	0.95	3.35 KVA
Total		103.33 KW		126.91 KVA		83.32 KVA
Calculation of receiving		Calculated on the diversity factor of 1.0, $83.32 \times 1.0 = 83.32$				90.00 KVA

Table A-3 Emergency Generator Capacity Requirement

Item	Phase	Total power consumption	Power factor conversion rate	Approximate load input	Demand rate	Receiving capacity requirement
Light fixture	Single-phase	12.92KW	1.250	16.15KVA	0.80	12.92 KVA
Outdoor light, floodlight	Single-phase	1.08 KW	1.500	1.62 KVA	1.00	1.62 KVA
General socket facilities	Single-phase	8.40 KW	1.000	8.40 KVA	0.20	0.68 KVA
Single-phase item total						16.22KVA
Pressure pump	3-phase	1.50 KW	1.176	1.76 KVA	1.00	1.76 KVA
Drain pump	3-phase	0.75 KW	1.176	0.88 KVA	1.00	0.88 KVA
Aeration pump	3-phase	3.00 KW	1.176	3.53 KVA	1.00	3.53 KVA
3-phase item total						6.17KVA
Calculation for emergency generator	PG1 method	23.94KVA	PG2 method	8.1KVA	PG3 method	27.12KVA
	Comparing by PG1、PG2、PG3 27.12KVA capacity necessary and decided generator company catalogue 37KVA,					37 KVA

Remark: calculated during the evening time condition.

Table A-4 List for Power facilities

Installed place	Main power facilities
Ice making machines	Ice making machine 4ton/day: 27.5kw, 2 sets
Chilled room	Freezer unit: 3.0kw, 2 sets
Kitchenette, security guard room	Electric cooking utensils: 3.0kw, 2 sets
	Storage type electric hot water supply device: Hot water tank 50liter, 3.0kw, 2 sets
Pump room	Pressure pump : 1.5kw, 2 sets(automatic alternation driving method, 1 system)
Swear treatment system	Drain pump : 0.75kw, 2 sets(automatic alternation driving method, 1 system)
	Aeration pump : 1.5kw, 2 sets

Remark: Air conditioner not including

Table A-5 List for Air Conditioning and Ventilator

Insulated place	Air conditioner	Ceiling fun	Ventilator	Remark
Manager room	○		○	Split type air conditioner: 2.2kw Class “3” ventilator: 23w
Secretary room	○		○	Ditto
Drawing room	○		○	Ditto
Administration crew room	○		○	Split type air conditioner: 2.8kw Class “3” ventilator: 23w×2
Technical crew room	○		○	Ditto
Reference room			○	Class “3” ventilator: 23w
Meeting room		○	○	Ceiling fun: 48w×5 Class “3” ventilator: 19.5w×2
Toilet (Man) (Female)			○	Class “3” ventilator: 23w×2
Shower room			○	Class “3” ventilator: 23w
Kitchenette			○	Class “3” ventilator: 25.5w
Corridor			○	Class “3” ventilator: 23w×2
Ice sales casher booth		○	○	Ceiling fun: 48w Class “3” ventilator: 23w
Fish boxes crew both		○	○	Ditto
Chilled room machine area			○	Class “3” ventilator: 550w×2
Security guard room		○	○	Ceiling fun: 48w Class “3” ventilator: 23w、25.5w
Cleaning crew room		○	○	Ceiling fun: 48w Class “3” ventilator: 23w
Emergency generator room			○	Class “2” ventilator: 25.5w
Pump room			○	Class “3” ventilator: 19.5w
Toilet (Man) (Female)			○	Class “3” ventilator: 19.5w×2

## 6-2 Study for the ratio of ice volume for fish storage

a. The amount of ice required for decreasing the body temperature of fish

Most popular pelagic fish such as Bonga and Sardine, body length is 25 to 30cm, and other demersal fish, maximum body length is around 50cm, are commonly sold in Brikama market. These fish meat contains 73% water and 27% solids. The ratio of specific heat coefficient is 0.82 [kcal/kg°C] and the ratio of ice volume against fish weight, which is required for reducing a temperature of 30°C (the average outside temperature) to 1°C, is as following calculation.

Latent heat of fusion for ice = 79.6 kcal/kg

Fish weight: W, Coefficient Ratio of specific for fish: S,

Initial temperature: t<sub>1</sub>, Reduced temperature: t<sub>2</sub>

Reducing heat  $Q = W \cdot S (t_1 - t_2)$

Ratio of specific for fish (Fresh fish) = 0.82 [kcal/kg°C]

Temperature difference : t<sub>1</sub> = 30°C, t<sub>2</sub> = 1°C

Cooling of quantity  $Q = 100\text{kg} \times 0.82 \times (30^\circ\text{C} - 1^\circ\text{C}) = 2,378 \text{ kcal}$

Necessary ice quantity = 2,378 kcal ÷ 79.6 kcal/kg = 29.9 kg ⇒ Fish : Ice = 1 : 0.3

b. The amount of an ice required for keeping fish at a low temperature in the cooler box

Ready-made type of cooler boxes shall be procured, following insulation capability is estimated from the catalogue data.

Case : Company [A] , capacity of 120liters insulation data (catalogue)

Board material : Surface (polyethylene t=3mm×2layers) + Insulating material (foam urethane t=40mm) :

Outer dimension : L(910mm)×W(525mm)×H(470mm) : Outer surface area 2.31m<sup>2</sup>

Inner dimension : L(793mm)×W(398mm)×H(385mm) : Inner surface area 1.55m<sup>2</sup>

Thickness            117mm        127mm        85mm

Case : Company [A] , capacity of 90 litres insulation data (no data for performance)

Board material : Surface and insulation are same as the 120 litre type, but size are not shown. :

Outer dimension : L(836mm)×W(449mm)×H(442mm) : Outer surface area 1.88m<sup>2</sup>

Inner dimension : L(730mm)×W(330mm)×H(357mm) : Inner surface area 1.24m<sup>2</sup>

Thickness            106mm        119mm        85mm

Hence, Performance data of 90 litre cooler box are not indicated in the catalogue, and for the convenience, data from 120 litre type of cooler box were applied. According to the 90 litres cooler box outside surface dimension is around 80% of 120 litre type, heat intrusion will be smaller than the



120 litre type. However, thickness of heat insulation material is larger than the 90liter type, as consequence, total performance is almost similar,

Company "A" publicize following experimental data for 120-litre type as performance;

Company "A" showing the "ice reducing ratio 45%" and 17kg of ice reducing rate data according to laboratory test is as below;

Company "A" 120 litre cooler boxes company performance regulation = Ice reducing ratio is less than 45%.

Test result

Background condition : laboratory temperature :  $30 \pm 3^{\circ}\text{C}$

Size of Ice: 270mm x 480mm x 150mm (17kg), Kept in the cooler box for 24 hours

Sample (1): Initial ice weight 17.19kg, final ice weight 10.94kg

Sample (2): Initial ice weight 16.39kg, final ice weight 10.23kg

Result of ice reducing rate

Sample (1): reducing weight 6.25kg, reducing rate  $36.4\% < 45\%$

Sample (2): reducing weight 6.16kg, reducing rate  $37.6\% < 45\%$

(Heat intrusion =  $(17.19 - 10.94)\text{kg} \times 79.6 \text{ [kcal/kg]} = 497.5 \text{ [kcal/24h]}$ )

As the result of test, ice reducing rate is estimated to be less than 45%.

Rather than introducing specification of ice box as "reduction rate is less than 45%", it is essential to calculate and estimate the ice reduction volumes when storing fresh fish in the cooler box.

Ice reducing ratio =  $17 \text{ kg} \times 45\% = 7.65 \text{ kg}$  (24hours)

Fresh fish storing length (hours) is from 18:00 to 8:00. (Total 14 hours)

Reduction of ice weight:  $7.65\text{kg} \times 14\text{hours}/24\text{hours} = 4.5\text{kg}$

Volume and ratio of the ice required for both types of cooler boxes is calculated as follows;

120 litre type: fresh fish weight 60kg - ice reducing weight 4.5kg = 1:0.08

90 litre type: fresh fish weight 45kg - ice reducing weight 4.5kg = 1:0.10

c. Required volume of ice for storing fish in the fish boxes kept in the chilled room

The chilled room is covered with heat-resistant insulated material to retain storage temperature inside the chilled room at  $1^{\circ}\text{C}$  with small cooling unit. If the doors are not opened at all, but this is not good enough to reduce the actual body temperature of stored fish.

It is assumed that the temperature in the storage rose to 15 degrees Celsius in average during the daytime business hours (when frequently utilize the chilled room) from the following reasons

- Air intrusion by opening fish box,
- Heats generated from the lightning
- Heats from the worker

In the case of Tanji landing site, designed temperature for the cold storage for storing fresh fish

is -5 degrees Celsius, However, actual temperature rose up to 15 degrees Celsius by the same reasons.

From above reasons mentioned, further estimation was calculated for the required amount of ice from the below setting conditions.

- Radiant heat to the temperature value of the chilled room, fish box kept in the low-temperature
- Calculate amount of ice to match the balance with necessary heating value

The ice quantity that is necessary for temperature value holding in the fish box by the relationship of the temperature radiation can be calculated.

Following calculation shows the ice quantity that is necessary for temperature value holding in the fish box by the correlation of the temperature radiation

Heat radiation  $Q_H = e \sigma S T^4$

$Q_H$  : Amount of heat radiation (per 1 second : unit J, 1cal=4.186J)

$e$  : Heat radiation ratio (Fish box material is resign : General 0.6~0.9, hence 0.7)

$\sigma$  : Stefan-Boltzmann coefficient :  $5.67 \times 10^{-8} \text{ W/m}^2 \cdot \text{K}^4$

$S$  : Fish box surface area (1.46m<sup>2</sup> : dimension (L)0.9m, (W)0.5m, (H)0.2m)

$$A = (0.9 \times 0.5) \times 2 + (0.9 + 0.5) \times 2 \times 0.2 = 1.46 \text{ m}^2$$

$T_1$  : Absolute temperature in chilled room (288K, 15°C)

$T_2$  : Absolute temperature in fish box (274K, 1°C)

Heat radiation (per 1 second)

$$Q_H = e \sigma S T_1^4 = 0.7 \times 5.67 \times 10^{-8} \text{ W/m}^2 \cdot \text{K}^4 \times 1.46 \text{ m}^2 \times (274 \text{ K})^4 = 326.6 \text{ J}$$

Heat absorption (per 1 second)

$$Q_H = e \sigma S T_2^4 = 0.7 \times 5.67 \times 10^{-8} \text{ W/m}^2 \cdot \text{K}^4 \times 1.46 \text{ m}^2 \times (288 \text{ K})^4 = 398.7 \text{ J}$$

Hence, fish box receive heat absorption amount per second is  $398.7 - 326.6 = 72.1 \text{ J}$

One hour heat absorption amount is  $72.1 \text{ J} \times 3600 / \text{sec} \div 4,186 \text{ J/kcal} = 62.0 \text{ kcal/hour}$

Heat amount convert to the necessary latent heat of fusion of ice for fish box (35kg fresh fish) per one hour.

$$62.0 \text{ kcal/h} \div 79.6 \text{ kcal /kg} = 0.78 \text{ kg/h shall be needed.}$$

Actually chilled room temperature rise 15°C is around 8 hours per day, hence necessary ice is  $0.78 \text{ kg/h} \times 8 \text{ hours} = 6.2 \text{ kg/box}$

Required ice weigh for per fresh fish weight is calculated to  $6.2 \text{ kg/box} \div 35 \text{ kg}$  (fresh fish weight) = 0.18

**THE REPUBLIC**



**OF THE GAMBIA**

**Fisheries Department  
6. Marina Parade  
Banjul**

**Ref: FD\267\50\Vol.VI (61)**

**16<sup>th</sup> January 2008**

Mr. Shin MARUO  
Rural Development Team  
Grant Aid Management Department  
JICA

**Subject: The Project for construction of Brikama Fish Market  
Accessibility of market hall and the alleys**

Thank you for your advice for the captioned matter for the project. We have received the advice to exclude the grills fixed on the surrounding the market hall for respect the equality for the each vendors and easily market maintenance through the consultant. We discussed with retailers representatives and other staff to exclude the grill, and the following faults are assumed:

1. Extra security guards will be needed during night time when the market closes.
2. Life span of cooler boxes will be shortened by damages of fixing metal chain and metal stoppers for them. According to our roughly calculation, average cooler boxes life span will be reduced from 6 year to 4 years to excludes the grill.
3. These two items affects negative impacts for the market operation for long term. Concretely, an expense increase in the following amounts of money is assumed.

Security person 2 person x 700dls x 12 = 16,800dls/year

Yearly cooler boxes saving cost rise to 243,000dls from 162,000dls.

Total yearly increasing cost will be 98,000dls per year. So original plan yearly profit is around 600,000, if we exclude the grill profit will be reduced to 500,000dls.

On the other side we confirmed the type of the grill proposed by the consultant, is very popular and easy to see the in side of the market hall from the out side alleys. And market hall outside pass has enough width and will never hamper the consumers walking in the market hall even though grills are remaining. So we think it is necessary to retain the grill rather than to exclude them.

I also was informed by the consultant that JICA staff are worried about the irregular use of the market hall pass by installing the grill. As for proposed grill mesh interval is big, so that irregular user can not leave own belongings on the pass and especially opposite side vendor claims for irregular users to reduce own sales activity. Please be assured that the Market Manager will control the market operation smoothly.

These are our views and comments, however, if the Japanese side does not accept suggestions, please be assured that we can manage the Brikama fish market facilities with out the grill. But because of effective and profitable operation for the project we opt to install the grill which is better for us.

Best Regards,



.....  
Nfamara J. Dampha  
For: Director of Fisheries

## 6-4 Study for the roof material and roof truss of the Fish Retail Market.

### 6-4-1 Study for use large-size shape roof

#### 1. Necessary outside-facing openings area in 2<sup>nd</sup> floor office space from local building code

In case to use large shape roof for Fish Retail Market as shown as figure 6-1, 2<sup>nd</sup> floor office space needs necessary out-side facing openings area at the red-circle positions. To select the large shape roof that covers 1<sup>st</sup> and 2<sup>nd</sup> floor, installing skylight windows for gain the daylight under the dark large shape roof. Also it is necessary to install the skylight windows on the roof part of the necessary rooms.

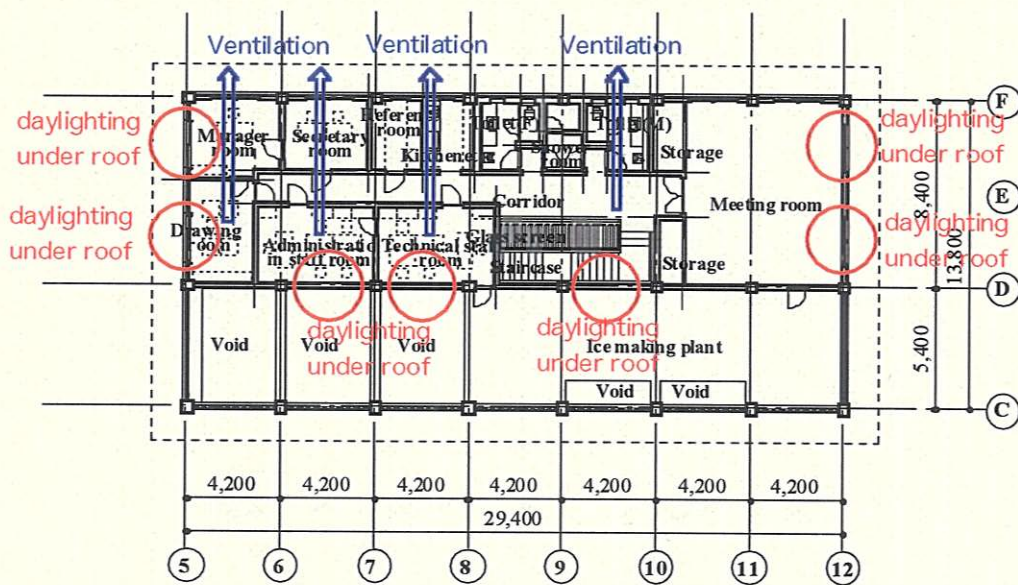


Figure 6-1 Necessary open areas on the 2<sup>nd</sup> floor office

For planning of the 2<sup>nd</sup> floor escape route, basically to install the two staircases on the both tip on the office space, but it is very hard to plan the staircase between 1<sup>st</sup> floor lay out plan, finally to plan the office space and machine room for escape route and down to 1<sup>st</sup> floor by emergency ladder from the machine room.

#### 2. Fish Retail Market roof shape for the large-size shape roof

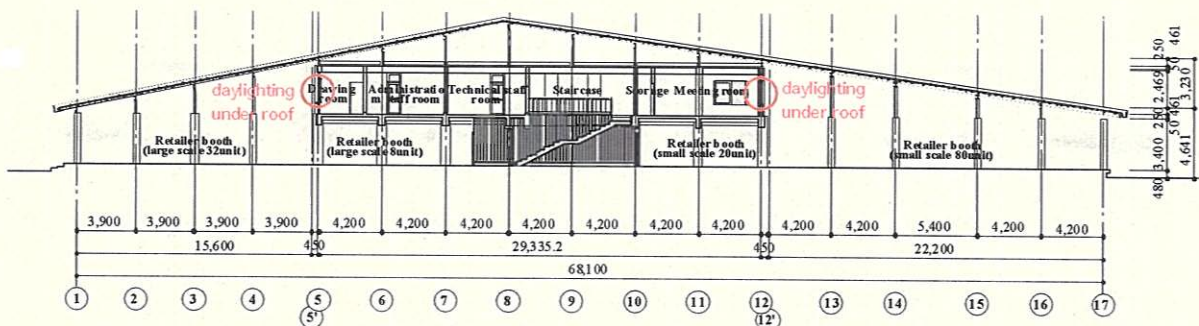


Figure 6-2 Section plan of the large-size shape roof case

In case to select the large shape roof, as shown as figure 6-2, whole Fish Retail Market roof height is very high and column and roof truss will be very large, hence this type is disadvantage for construction cost and method from other roof truss

### 6-4-2 Examination details for roof material and roof truss

#### 1. Relation of the roof gradient and roof truss

Roof truss gradient and roof truss shape designed by selected roof material. Fish Retail Market plan is almost square, hence if choose the large gradient roof material, roof ridge height will be higher and roof truss system is large as shown as the figure 6-3 and 6-4.

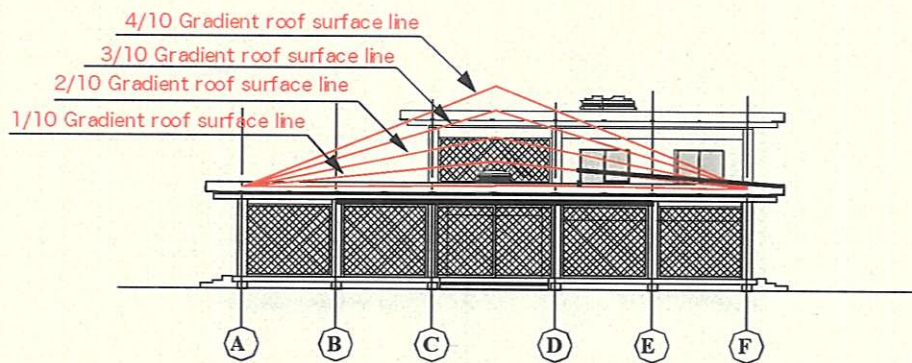


Figure 6-3 In case of roof gradient South to North

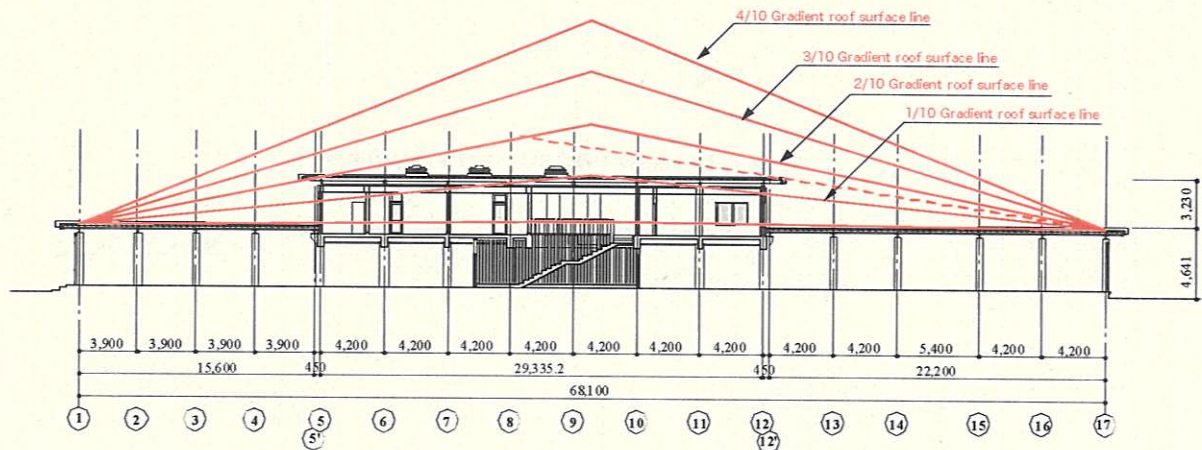


Figure 6-4 In case of roof gradient East to West

General used roof materials are classified by normal necessary roof gradient as shown as table 6-6. Less than 2/10 gradient roofs categories are selected for Fish Retail Market roof, hence small gradient roof materials are advantage for construction cost for comparing the normal roof material.

Table 6-6 Roof material gradients for general used roof material

Standard roof gradient	Roof material name
4/10	Roof tile (Western tile, Spanish tile), Corrugated cement sheet, Slate roofing
3/10	Asphalt shingle roofing, Thick cement tile
2/10	Metal sheet batten seam roofing
1/10~1/100	Metal sheet standing seam roofing (minimum gradient 1/10), Metal folded plate roofing (minimum gradient 3/100), Asphalt sheet roofing (minimum gradient 1/100)

\*Asphalt sheet roofing use for the flat roof floor for the ordinary buildings and topcoat surface shall be covered by topcoat layer with mineral grain or slate sand

### 3. Selection of the roof truss for Fish Retail Market

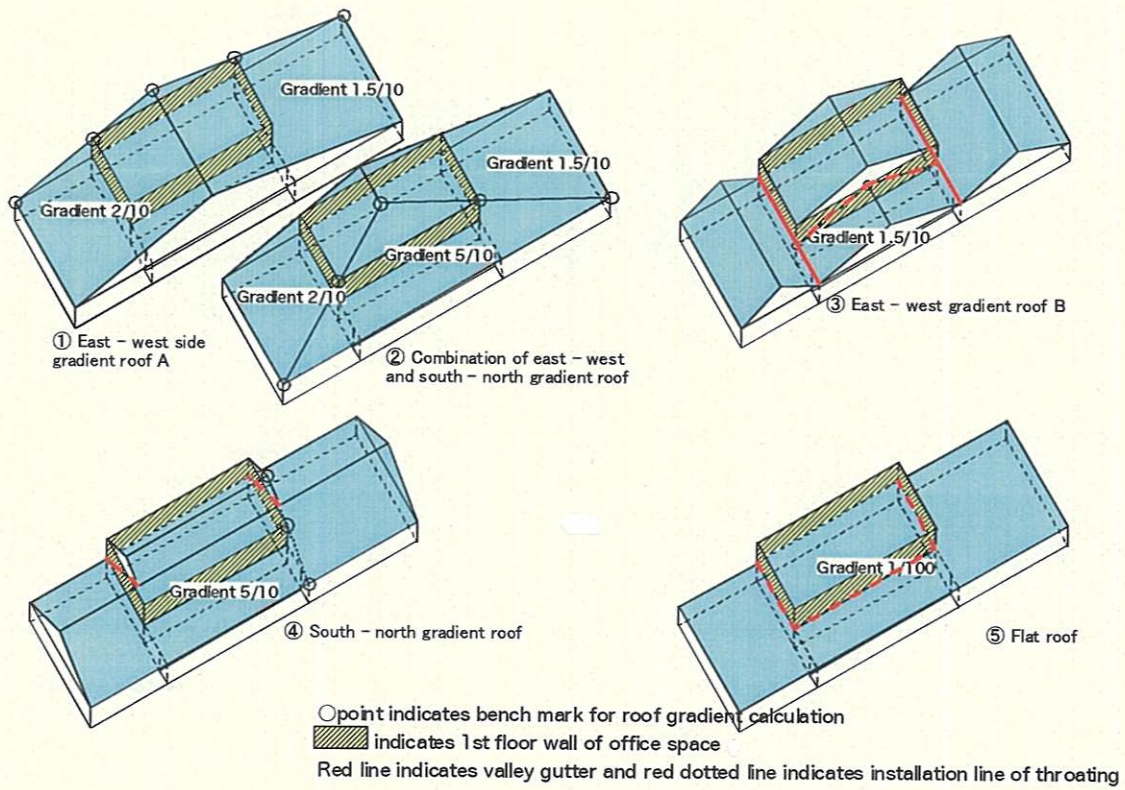
Selection for roof shape for Fish Retail Market roof truss are assumed various type roof styles as shown as figure 6-5.

Case ① and ② are, planed by large shape roof covered the 2<sup>nd</sup> floor office space by small gradient roof material, even though use small gradient roof needs many skylight windows to in take daylight, it is disadvantage from the construction cost from other roof style, then large shape not selected these types.

Case ③ and ④ are planed by normal gable roof style separated 1<sup>st</sup> floor and 2<sup>nd</sup> floor. Case ③ needs large size valley gutter and it needs waterproof construction ability on wall for 2<sup>nd</sup> floor. Case ④ needs many skylight windows for drawing room and other rooms for daylight, and also it needs appropriate measure to protect for rain water blows in to inside of Fish Retail Market from gable side.

Case ⑤ flat roof is easy to take daylight for 2<sup>nd</sup> floor office space by roof surface is flat, less rain water blow to the market and lower construction cost from other roof style, then flat roof is style selected for Fish Retail Market roof.

For adaptable roof material for flat roof are metal folded plate roofing and asphalt sheet roofing. In case of metal folded plate roofing installation, it needs crane to lift up the metal roof material to the roof, but north side temporary access road width keep only 3 to 5m from boarder line of the project site to building wall outer surface line. From such background, metal folded plate roof material shall be lifted up from south side temporary access road by large size crane, but domestic procurable crane is only 20t class capacity, and it not enough to lift up to from south side. Hence expensive large class crane necessary procured from third countries. Like this background asphalt sheet roof is selected from construction cost. Asphalt sheet roof has many type, so modified bituminous waterproofing membrane sheet double adhesive method is selected view from the high dependable and durability



**Figure 6-5 Comparison roof shape for Fish Retail Market**



## 6-5 Post Harvest Loss study

The study for the post harvest loss of fisheries product in West Africa Country including Gambia was carried by FAO for five years of term from November 1999 by the grant of the British international development ministry.

In the report, the post harvest losses during the distribution period from fish harvest to consumer are estimate to 20 - 25% in general, and up to 50%. Post harvest loss is categories to “Physical losses” and “Economic loss”. Physical loss is causing damage during fish handling or transporting system. “Economic losses” is caused by loss of the fish quality by reducing the freshness by temperature increase of fish body. According to the report, the economic losses possess large ratio of the post harvest losses and Physical losses are estimated to 10% of the post harvest losses from the field survey.

Field survey conducted by Fisheries Department of the Gambia suggest in the case of the Gambia Combo district (Gunjur and Tanji; where fish landing site for Brikama fish market), the post harvest losses is estimated to 30% and of these, 10-15% were lost during sales.

### 1. Verification of the post harvest losses in retailing stage.

Post harvest losses start from the moment of the fish unloading at the site through retailing stage.

Currently, following distribution process is taken by local distributor.

Vessel returning to site/Fish unloading→ (Price Negotiation) →Loading to mini bus→Transfer→ Unloading (market)→Fish handling→Selection→Preservation→Transportation to market→Retail sales. According to the Gambia Fisheries Department survey, post harvest losses is estimated to 10 - 15%, and from this output, the base line for post harvest losses is set to 10% for the Brikama Fish market.

### 2. Presumption to improve the post harvest losses

In this project, the post harvest losses will be reduced 5% by installation of the market hall with roof and storage condition, which will improve from current condition.

### 3. Output indicator

Post harvest losses including physical and economic losses are estimated to be 5% as described before. Total post harvest volume is calculated as follows;

Total fish handling of Brikama Fish Market:

$$10\text{ton/day} \times 350\text{day} + 4\text{ton} \times 115\text{day} = 3,960\text{ton/year}$$

$$\text{Post harvest losses(before): } 3,960\text{ton} \times 10\% = 396\text{ton/year}$$

$$\text{Post harvest losses(after): } 3,960\text{ton} \times 5\% = 198\text{ton/year}$$

The ratio of waste produced from a physical post harvest loss is estimate to 10% of the total post harvest losses as follows.

Waste(before):  $396\text{ton/year} \times 10\% = 39\text{ton/year}$ , 111kg/day

Waste(after):  $198\text{ton/year} \times 10\% = 19\text{ton/year}$ , 55kg/day

For measurement of weight of the waste is available to confirm by monitoring the garbage depot in the Market. However it is critical to separate the debris from the mince process for accurate statistic.

Measurement of the economic losses can be monitor by interview to the fish retailers. On the others hand, conducting field survey to the market is also reliable.

## 6-6 Soil investigation result

### Boring survey point No.1 Soil boring log

PROJECT:		LOCATION:							
B.H.No		Brikama Fish Market			Brikama			Date Started: 10.08.07	
1		PERCUSSION			150mm			Date Completed: 11.08.07	
DATE	STRATA DESCRIPTION	Depth (m)	Legend	Reduced Level (m)	Water Level	Casing Depth	SAMPLE		-N- TEST
							No.	TYPE	VALUE TYPE
10.08.07	Laterite gravel FILL	0.50		19.02					
		0.60		18.42			1	B1	
							2	J1	10 (62%) S1
		1.50					3	B2	
		2.00					4	J2	13 (100%) S2
		2.50					5	B3	
11.08.07	Medium brown firm to stiff sandy CLAY. Becoming mottled brown/medium red at 2.00m and mottled light grey/light red at 3.00m	3.00					6	J3	8 (71%) S3
		3.50					7	B4	
		4.00					8	J4	7 (73%) S4
		4.50					9	B5	
		4.70				14.32			
	Mottled medium olive/light grey stiff CLAY with pebbles (6mm)	5.00			14.02			10	J5
									(End of borehole)

#### SYMBOLS - KEY

U(100) indicates 100mm (4in) undisturbed sample  
 U(38) indicates 38mm (1 1/2in) undisturbed sample  
 B- indicates disturbed bag sample  
 J- indicates jar sample  
 S- indicates Standard Penetration Test  
 N- indicates no. of blows / 12in(300mm). penetration  
 V- indicates vane test

#### REMARKS





**Notes:**  
 1: No ground water struck in borehole  
 2: Figure shown (73%) indicates percentage sample recovery

FIG. 1 SHEET 1 OF B.H. 1

## Boring survey point No.2 Soil boring log

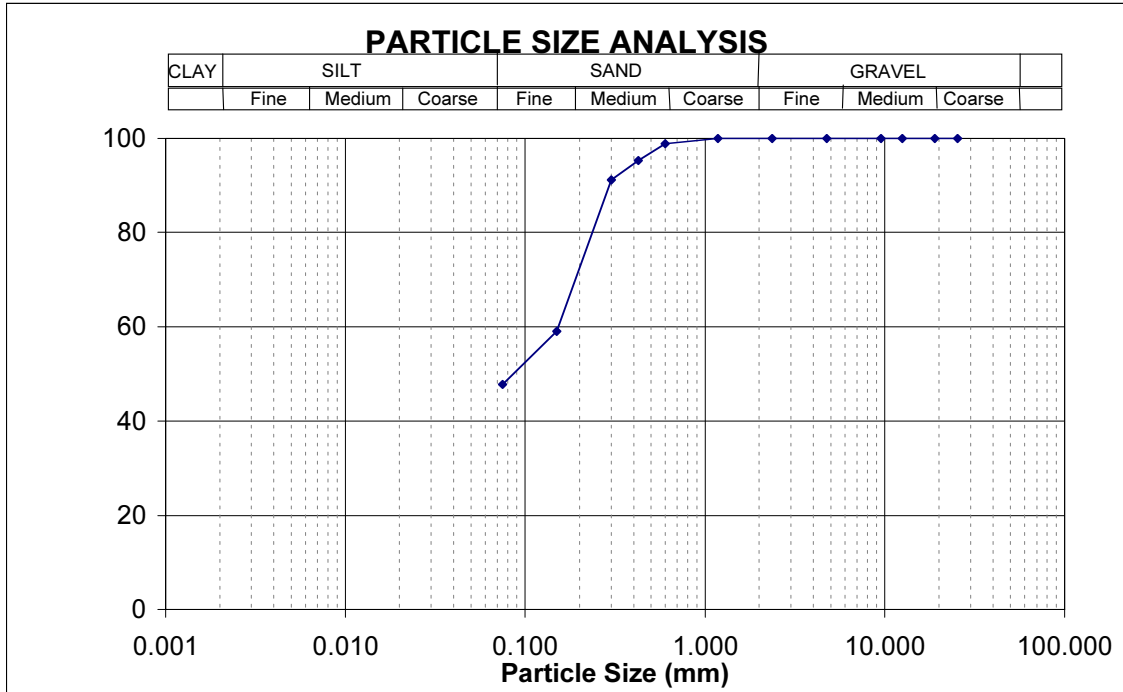
PROJECT: Brikama Fish Market				LOCATION: Brikama						
B.H.No	TYPE OF BORING:			Dia.of Boring:	Date Started:					
2	PERCUSSION			150mm	10.08.07					
DATE	STRATA DESCRIPTION	Depth (m)	Legend	Reduced Level (m)	Water Level	Casing Depth	SAMPLE		-N- VALUE	TEST TYPE
							No.	TYPE		
10.08.07	Laterite gravel FILL	0.50		19.07			1	B1		
		0.65		18.42						
		1.00					2	J1	13 (84%)	S1
		1.50					3	B2		
	Dark brown stiff sandy CLAY. Becoming mottled medium brown/medium red at 2.00m	2.00					4	J2	15 (100%)	S2
		2.50					5	B3		
		3.00		16.07			6	J3	17 (91%)	S3
		3.50					7	B4		
	Mottled medium olive/medium red very stiff sandy CLAY with occasional pebble	4.00					8	J4	26 (82%)	S4
		4.16		14.91						
	Mottled medium olive/light grey very stiff sandy CLAY	4.50					9	B5		
		5.00		14.07			10	J5	26 (67%)	S5
				(End of borehole)						
<b>SYMBOLS - KEY</b> U(100) indicates 100mm (4in) undisturbed sample U(38) indicates 38mm (1 1/2in) undisturbed sample B- indicates disturbed bag sample J- indicates jar sample S- indicates Standard Penetration Test N- indicates no. of blows / 12in(300mm). penetration V- indicates vane test				<b>REMARKS</b>  <b>Notes:</b> 1: No ground water struck in borehole 2: Figure shown (84%) indicates percentage sample recovery						
				FIG. 2	SHEETÉ 1	OF B.H. Í 2				

## Boring survey point No.3 Soil boring log

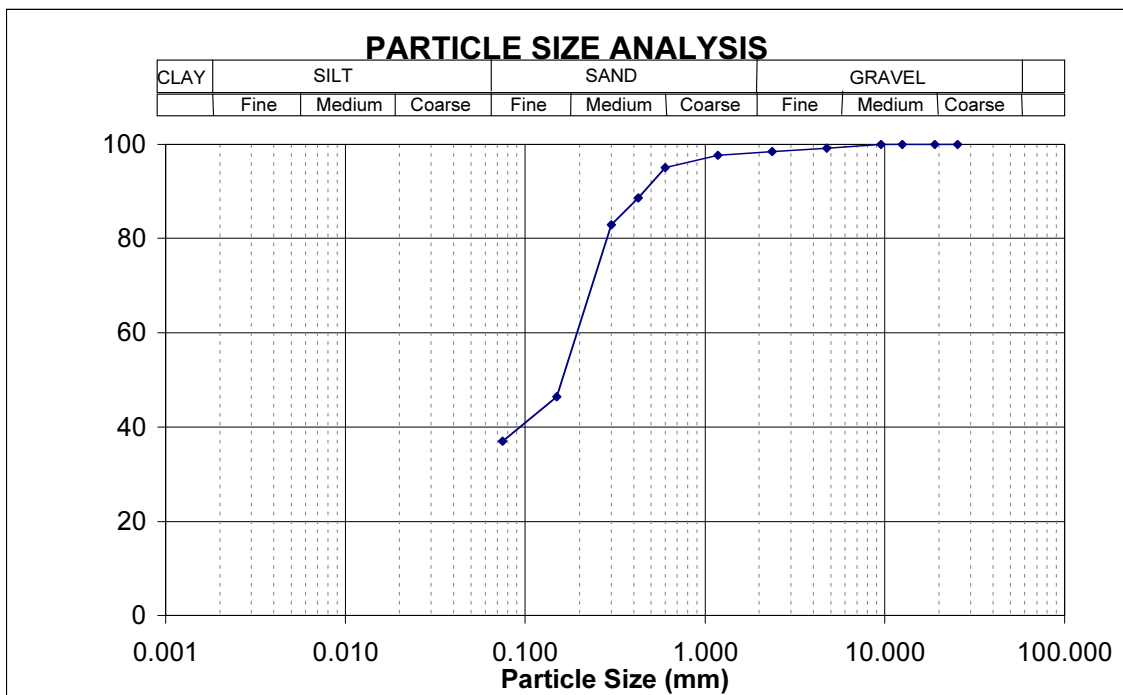
PROJECT: Brikama Fish Market		LOCATION: Brikama								
B.H.No	TYPE OF BORING: PERCUSSION	Dia.of Boring: 150mm				Date Started: 13.08.07				
DATE	STRATA DESCRIPTION	Depth (m)	Legend Level (m)	Reduced Level	Water Level	Casing Depth	SAMPLE		-N- VALUE	TEST TYPE
							No.	TYPE		
13.08.06	Laterite gravel FILL			19.24						
	Dark brown stiff sandy silty CLAY with some stones	0.86 1.00		18.38 18.24			1 2	B1 J1	9 (84%)	S1
	Medium brown stiff sandy CLAY	1.50 2.00					3 4	B2 J2		
	Mottled medium brown/medium red stiff sandy CLAY with some stones (12mm)	2.50 3.00 3.50 4.00 4.50 5.00		17.24  15.24 14.24			5 6 7 8 9 10	B3 J3 B4 J4 B5 J5	10 (91%) 10 (78%)	S2 S3  S4 S5
				(End of borehole)						
<b>SYMBOLS - KEY</b>			<b>REMARKS</b>							
U(100) indicates 100mm (4in) undisturbed sample U(38) indicates 38mm (1 1/2in) undisturbed sample B- indicates disturbed bag sample J- indicates jar sample S- indicates Standard Penetration Test N- indicates no. of blows / 12in(300mm), penetration V- indicates vane test			<b>Notes:</b> 1: No ground water struck in borehole 2: Figure shown (91%) indicates percentage sample recovery							
			FIG. 3 SHEETÉ 1 OF B.H. I3							

**Result of Particle size distribution analysis of soil layer**

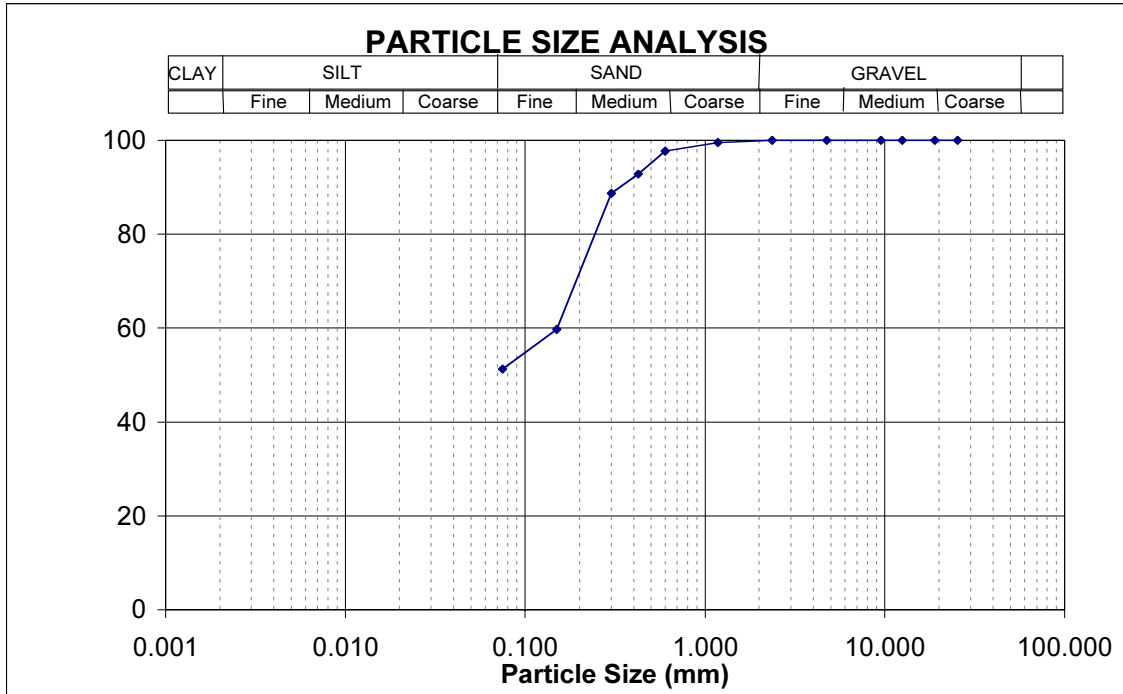
Bore Hole No.1 –2.5m from ground level



Bore Hole No.2 –4.5m from ground level



Bore Hole No.3 –1.5m from ground level



Bore Hole No.3 –4.5m from ground level

