

BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR
RE-MODELING OF
NEW KINGSTOWN FISH MARKET
IN
ST. VINCENT AND THE GRENADINES

AUGUST 2003

JAPAN INTERNATIONAL COOPERATION AGENCY
CRC OVERSEAS COOPERATION INC.

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PREFACE

In response to a request from the Government of St. Vincent and the Grenadines, the Government of Japan decided to conduct a basic design study on the Project for Re-modeling of New Kingstown Fish Market and entrusted the study to the Japan International Cooperation Agency (JICA).

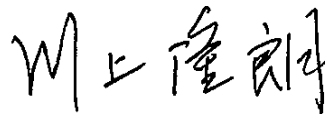
JICA sent to St. Vincent a study team from February 8 to March 4, 2003.

The team held discussions with the officials concerned of the Government of St. Vincent, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to St. Vincent from May 20 to May 26, 2003 in order to discuss a draft basic design, and as this result, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of St. Vincent and the Grenadines for their close cooperation extended to the teams.

August, 2003

A handwritten signature in black ink, consisting of stylized Japanese characters, positioned above a horizontal line.

Takao Kawakami

President

Japan International Cooperation Agency

August, 2003

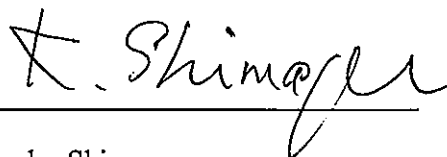
Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Re-modeling of New Kingstown Fish Market in St. Vincent and the Grenadines.

This study was conducted by CRC Overseas Cooperation Inc., under a contract to JICA, during the period from February, 2003 to August, 2003. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of St. Vincent and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,

A handwritten signature in black ink, appearing to read "K. Shimazu", written over a horizontal line.

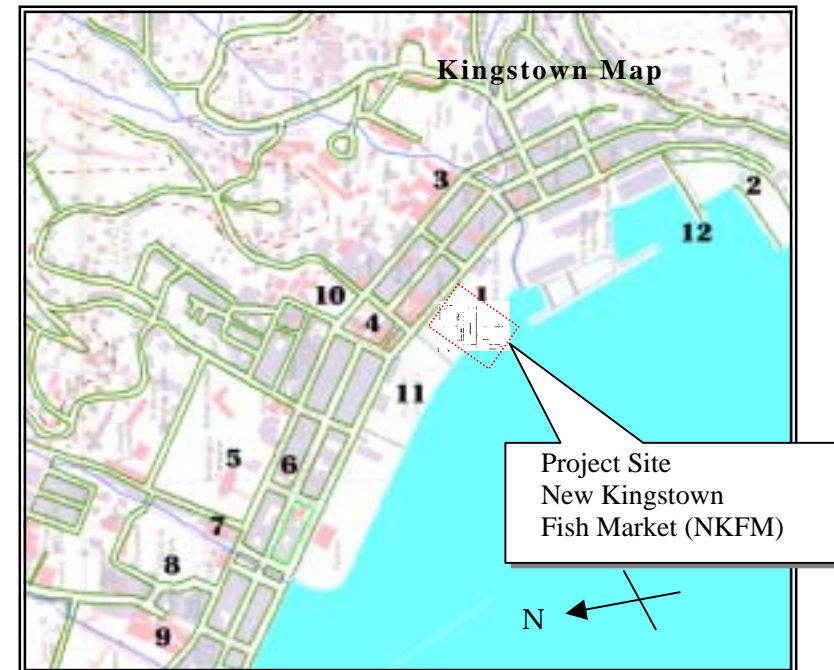
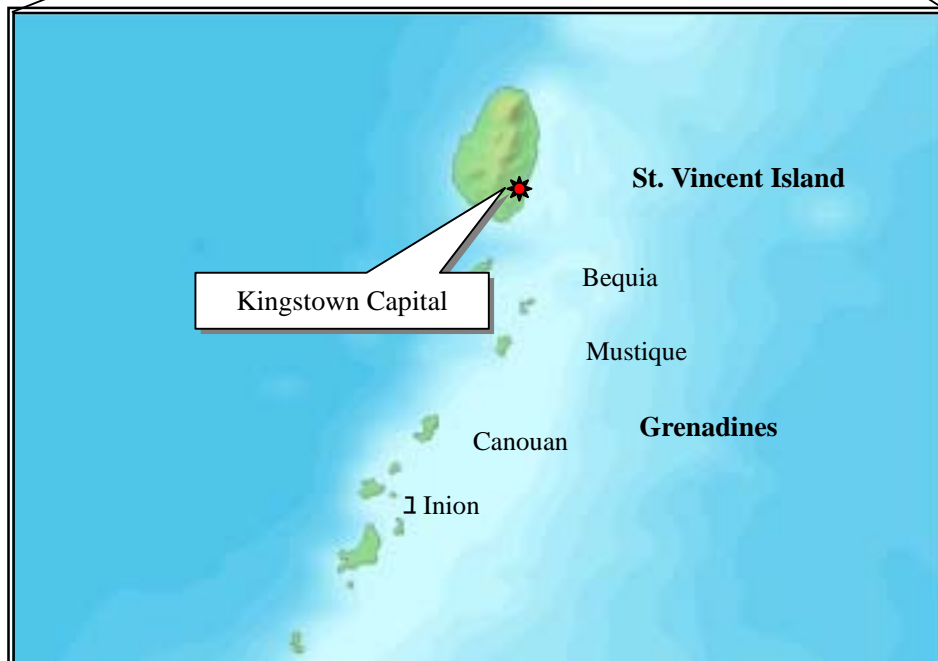
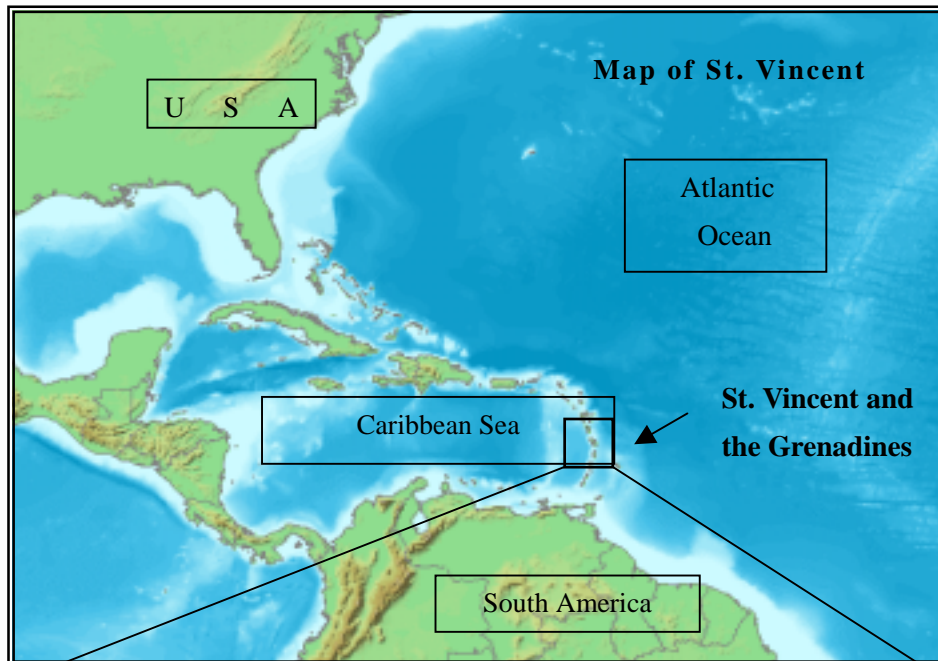
Kohsuke Shimazu

Project manager,

Basic design study team on

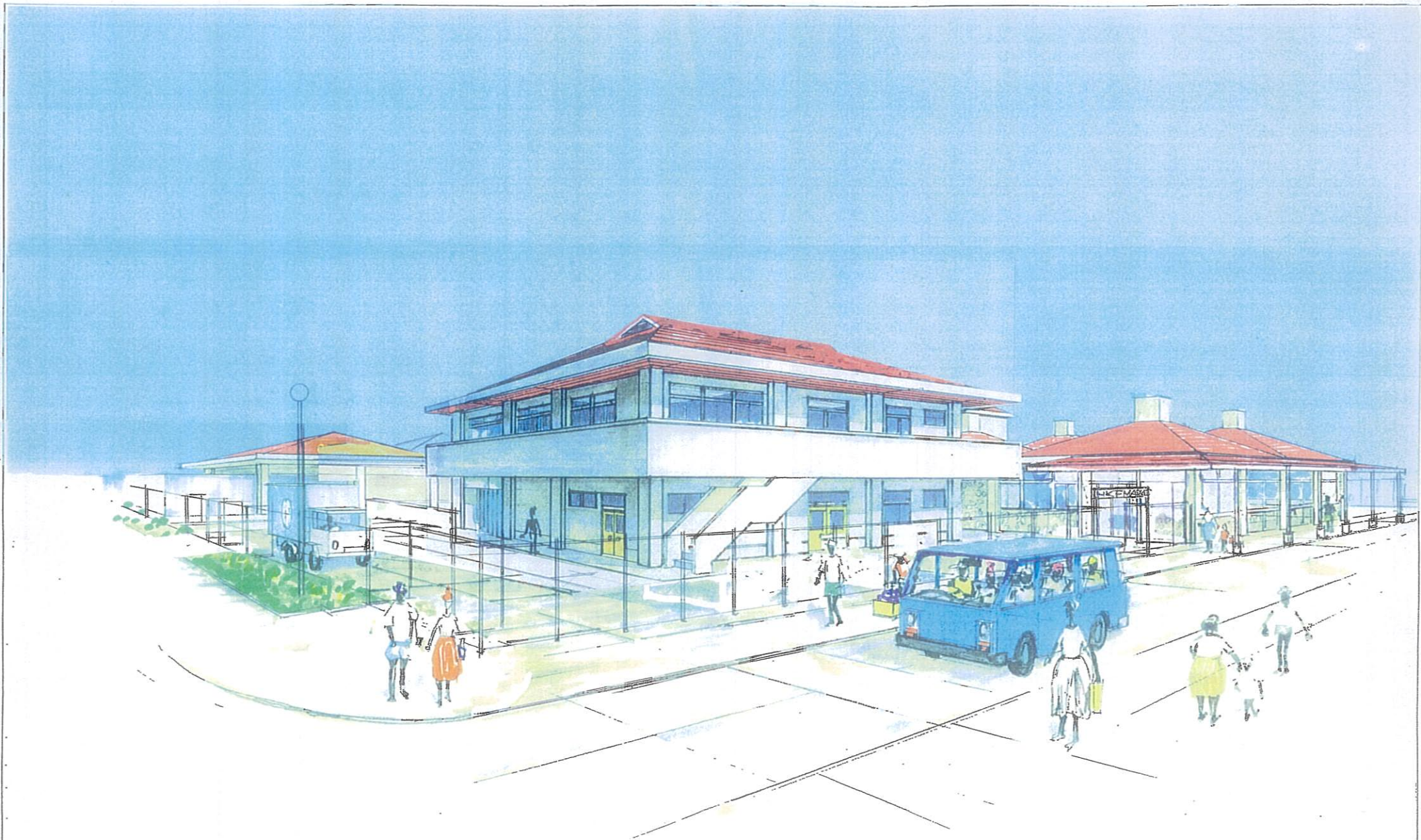
the Project for Re-modeling of New Kingstown Fish Market

CRC Overseas Cooperation Inc.



- 1 . Government Offices
- 2 . Tourist Office / Cruse Doc
- 3 . Post office
- 4 . Market
- 5 . Africans Church
- 6 . Methodist Church
- 7 . Catholic Church
- 8 . Victoria Park
- 9 . Hospital
- 10 . Court
- 11 . Bus Terminal
- 12 . Ferry Doc

St. Vincent and the Grenadines Map



THE PROJECT FOR RE-MODELING OF NEW KINGSTOWN FISH MARKET

PERSPECTIVE

SCALE

DRAWING NO.

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ABBREVIATIONS

ASTM	American Society for Testing and Material
BOD	Biochemical Oxygen Demand
BS	British Standard
CARICOM	The Caribbean Community
CCP	Critical Control Points
CFRAMP	CARICOM Fisheries Resources Assessment Management Program
CIDA	Canadian International Development Agency
CIF	Cost, Insurance and Freight
COD	Chemical Oxygen Demand
CUBC	Caribbean Uniform Building Code
DANIDA	Danish International Development Assistance
DO	Dissolved Oxygen
ELISA	Enzyme-Linked Immunosorbent Assay
EU	European Union
FAO	Food and Agriculture Organization of the United Nation
FOB	Free on Board
FRP	Fiber-Reinforced Plastics
GDP	Gross Domestic Product
HACCP	Hazard Analysis and Critical Control Point
HCFC	Hydro Chloral Flour Carbon
HPLC	High Performance Liquid Chromatography
JICA	Japan International Cooperation Agency
JIS	Japanese Industrial Standard
LCD	Liquid Crystal Display
NKFM	New Kingstown Fish Market
OS	Operating System
PA	Public Addressing System
PID	PID Control(Proportional, Integral, Differentiate)
RC	Reinforced Concrete
SS	Suspended Solids
TFT	Thin Film Transistor
VINREC	St. Vincent Electricity Services Ltd.
VTR	Video Tape Recorder

Summary

SUMMARY

St. Vincent and the Grenadines (SVG) is an island state, consisting of 32 small islands stretching north and south in the Windward Islands of the Lesser Antilles in the Eastern Caribbean Sea. The total land area is 389km². The largest, most important island is St. Vincent Island on which the capital, the city of Kingstown, is located, and to the south of the Island, the Grenadines containing Bequia Island, Canouan Island, Union Island and other small islands run on a line. The population is 113 thousand (2002) of which more than 70% are African-blacks.

All of the islands are of volcanic origin, mountainous and rugged. Nearly half of the gross area of St. Vincent Island is occupied by slopes with a gradient of more than thirty (30) degrees, and gradual descents less than five (5) degrees cover only 5% of the island. SVG belongs to the marine tropical climate, and the NE trade winds prevail throughout the year. Less fluctuation in temperature are observed throughout the year, with an annual average temperature of 27 °C. The annual rainfall is at its highest between June and December, averaging 3,700mm/year in the mountain region and 1,500mm in the flat region. Usually hurricanes pass through the north of the country, attacking the main land once in two (2) or three (3) years.

The 2000 GDP of SVG was \$340 million, \$2,520 per capita. The national economy depends heavily upon agriculture, mainly banana and arrowroot production, but the arable land covers only less than 10% of the whole land area due to its mountainous topography. Besides, Coastal fisheries and the Grenadines tourism for hibernating visitors from Europe and America between November and February are prevalent. The SVG economy will be unavoidable to depend upon the banana industry for some time to come, but the development of tourism, service sector and fisheries in place of agriculture has become a major subject of the SVG Government for the near future because the most-favored-nation provisions of banana between SVG and UK are to be terminated in a few years. The recent growth rate of GDP (1997 to 2000) is 4.5% annually, and contributions to GDP for each sector are Wholesale/Trade – 17.7%, Transportation – 13.7%, Agriculture/Fisheries – 12.0%, Manufacturing – 6.2%, and Hotel/Restaurant – 2.5% and the breakdown of 12.0% of Agriculture/Fisheries is 8.5% of agricultural products, 2.1% of fisheries, 0.9% of livestock, and 0.6% of forestry. The total labor force of SVG is 67 thousand people, of which 26% are engaged in Agriculture/Fisheries, 17% in Manufacturing, and 57% in service sector. The fishing industry employs 6% of the total labor force, about 4,000 people. The unemployment rate is estimated at 22%.

The 2000 national budget consisted of EC\$ 260 million of revenue and EC\$ 240 million of expenditure. The balance of foreign trade has shown enormous excess of EC\$ 240 million in imports (EC\$ 380 million) over exports (EC\$ 140 million) due to less resourceful island country.

As seen in its “Three Years National Development Plan (2001-2003),” the Government of St. Vincent and the Grenadines has an overall development objective of poverty alleviation through export-based growth and private sector development in the context of reduced income disparities and greater food security. In keeping with this line of development the basic policy objectives for the development of the fisheries sector are to:

- 1) Increase total production and productivity through upgrading quality control assurance system and improving post-harvest process;
- 2) Promote the growth of the artisanal fisheries with special emphasis on upgrading quality; and
- 3) Broaden the exports base and increase import substitution through introduction of export standard handling.

The total catch of SVG is some 800 tons. Since any type of industrial fisheries is not developed, all catch is harvested by small coastal fishing boats. Bottom hand lining for such small demersals as snapper and grouper on the coastal shelf, purse seining for such small pelagics as mackerel and horse mackerel, and trolling for such large pelagics as barracuda and dolphin are main fisheries. Besides, diving fishery for lobster and conch is performed.

Since the main industry, banana production, is now declining steadily, the development of the fishing industry for these comparatively abundant large or small pelagics and small demersals has become a major subject for the country from the viewpoint of both employment and food security.

At present, the distribution center of these fishery products is the New Kingstown Fish Market (NKFM). The NKFM was constructed in Kingstown, the capital of SVG, with assistance of the Japanese Government in 1987/88. The NKFM is receiving almost 90% of entire catch in the country, and has greatly contributed to expansion of production, distribution, and export of fishery products as the biggest fishing base as well as the largest distribution center. Furthermore, the whole facility is called “Little Tokyo” and is well known by not only the people of SVG but also the people of neighboring Caribbean countries as a symbolic representation of the cooperation activity of Japan, and has been operated as a model fish market in the region. However, the NKFM has now difficulty in coping with recent trend for greater demand for wholesome and better quality foodstuffs at home and abroad because of the facility’s superannuation of 15 years. As a result, it has become necessary for the NKFM to improve hygienic condition in production and distribution of fish, and to upgrade quality control by the renovation of market facilities in order to meet the demand of the supply of healthy fishery products.

Under these conditions, the SVG Government, aiming at supply consumers in and around Kingstown with high quality and safe fresh fish, formulated “The Project for Re-modeling of New Kingstown Fish Market” to improve hygienic condition during production and distribution, and thus, to supply wholesome and highly value-added fishery products by strengthening of the function of the

NKFM built in 1987 with grant aid of Japan, and requested the Government of Japan to extend a grant aid for its implementation in February, 2002.

In respond to the request, the Government of Japan decided to carry out a basic design study, and the Japan International Cooperation Agency sent a study team to SVG on the following schedule;

Basic Design Study : February 7 to March 6, 2003

Explanation of the Draft Basic Design Study : May 19 to May 28, 2003

The team carried out a site survey in SVG, analyzed its results in Japan, and thus examined the background and contents of the Project, natural conditions, the operation and maintenance system of facilities, and construction conditions in SVG, and finally designed the appropriated scale and contents of the Project as follows:

The Contents of Facilities

	Items	Specification
Renovation of Fish Market		Floor area Ground Floor 1,152m ² First floor area 288m ² Total 1,440m ²
	1. Renovation of existing floor including draining system	Ground floor are 852m ² Fish retail and processing area 648m ² Locker room & administration area 178m ² Toilet & shower booth 26m ²
	Repair of water plumbing	Part changing of water piping 600m
	Installation of air conditioning apparatus	For Processing area 120m ²
	Installation of window, doors and partitions	Re-layout of toilet, locker room, installation of • Insect net for fish retail area, • Doors for machine room • Passage to new facility both ground and first floor
	Repair roof and rain drain	Area 1,152m ²
	Removal and installation of retail counters	Remove 30 units and install 26 units
	Refrigeration equipment	
	(Remove)	(Newly installation)
	Ice making machine 2 tons /day 2units Cold storages (chilled) 2 rooms 24.8m ² Anteroom 18.0m ² Blast Freezer 18.0m ² Cold storages (-25) 3 units 229.3m ² Cold storage (chilled) 1 unit 17.6m ² Ice making machine / storage 2tons/day 1unit	Ice making machine 2tons /day 2 units Contact freezer for block ice 1 unit Blast freezer for fish 1 unit Block storage 5.5m ² Ante room 39.2m ² Cold storages (chilled) 2 units 36.8m ² Cold storages (-25) 2units 78.2m ²
Construction of Processing/Lab. Building	Total area	660m ²
	Ground floor Preparation room, processing room, smoking room, packing room, storage for packing materials, fish loading room, clean access room, quality control room, product sales room, locker rooms, toilets corridor, refrigeration facility	Ground floor area 336 m ² Refrigeration equipment 2ton/day Flake ice making machine with ice storage Cold storage -5 7.2m ² Cold storage -25 7.2m ² Blast freezer
	First floor Wet lab. with preparation room, dry lab. with preparation room, data room, chief lab. officer's room, lab. technicians room, meeting room, kitchenette, machine room, toilet and corridor and etc.	Floor area 324m ²
Other Facilities	Caves for customers Boat waiting room Fence and gates Guardsmen's posts Pavement (including parking spaces) Lights (for night safety) Septic tank & water tanks	173m ² 22.5m ² Fence 86.5m, gate 5units 2.4m x 2.4m 3 units 600m ² 6 units each 1 unit

The Contents of Equipment

	Item	Specification	Qty
Quality Control Equipment	Wet laboratory (For sanitary inspection)		
	Clean bench	Size: Approx.L1,300 × B850 × H1,900mm	1
	Incubator	Capacity: approx.100L	1
	Automatic autoclave	Capacity: 40 ~ 50L	1
	Drying sterilizer	Capacity: approx.70L	1
	Colony counter	Touch-sensor type, Digital display	1
	Others	Stomacher, Bacteria check sheet etc.	1 unit
	Dry laboratory (For general chemical analysis)		
	Draft chamber	Size: Approx.L1,200 × B750 × H2,200mm	1
	Cool centrifuge	Max revolution: 20,000rpm, Digital display	1
	Histamine analyzer	ELISA method, Absorption spectrometer	1
	Kjeldhal digester and auto titration unit	Digester:4 ~ 6	1
Data Management and Training Equipment	Water quality analyzer	Absorption measurement, Portable type	1
	Pure water apparatus	Generate capacity: approx. 1.8L/h,	1
	Others	Electric balance, Mixer etc.	1unit
	Glass apparatus (For both laboratories)	Graduated cylinder, Glass Erlenmeyer flask, Pipette etc.	1 unit
	Projector	LCD type	1
	VCR	Multi type	1
	Computer	OS : Windows, 2.0GHz, 17'TFT	1
	Scanner	A4 Legal size	1
	Printer	Color: ink-jet, Monochrome: laser, each1	2
	Others	Flip-chart stand, Projector screen etc.	1 unit
Fish Processing Equipment	Vacuum packing machine	Desktop type	1
	Belt conveyer	Length: Approx. 3m, with cutting table	1
	High pressure water cleaner	Expelling water volume: Approx. 700L/hour	1
	Carriage	Max load capacity: approx.500kg	2
	Digital weighing system (with printer)	Max weighing capacity : 500~600Lb, Water proof type	1
	Digital weighing system (with printer)	Max weighing capacity : 5 ~ 10Lb, Water proof type	1
	Spring scale (round type)	Display: pond, Weight range:30Lb/4oz	26
	Others	Plastic tray, Stainless tray, Stainless steel work table, Fly catcher etc.	1unit

When the Project is implemented in accordance with the Japan's Grant Aid Program, it will take 18 months to finish all works including the detail design work. The provisional total cost for the Project of each side is about 775 million in Japanese yen (Total 17.3 million EC\$, Japan side 16.9 million EC\$ and SVG side 0.4 million EC\$).

As for management and maintenance, the Project was designed so that revenues from the fish market/processing facilities will cover necessary costs, and the newly built laboratories will be independently operated with the Fisheries Division budget.

The implementation of the Project will have the following effects on problems with the distribution of fishery products in SVG and thus it is considered to be a reasonable and meaningful project with a Grant Aid.

- 1) Supplying high quality and safe fresh fish will be made possible through improving hygienic condition in process of handling of landed fish. Also fishery products will be supplied stably through improved facilities for storage of fish.
- 2) Various bacteria will be diminished on the vendors' counters through renovation of facilities. The breeding of flies and mosquitoes will be prevented, the production of foul smell prevented, and thus sanitary conditions in the retail area will be improved.
- 3) Export of wholesome fishery products satisfying various foreign standards will be made possible. Improvement of trade deficits can be expected through an increase of exports.
- 4) Activation of fish distribution and an increase of both domestic consumption and exports can be expected. By this, stable marketing will be secured and incomes of artisanal fishers will be stabilized. Their standard of living is expected to be raised.

Based of the expected effects above, it is judged that the implementation of the Project through the Grant Aid Program is appropriate.

After the completion of the Project, it is necessary for the SVG side to address the following problems so that the newly provided facilities, equipment and materials may be utilized effectively and the distribution of fish of the NKFM improves more.

(1) Fostering personnel required

The SVG side has experienced personnel to operate facilities of the existing fish market, and, in particular, it is necessary to establish a management/maintenance system to the refrigeration/ice-making facilities to be newly installed. These facilities are the biggest electricity-consuming units in the fish market, their electric charges may amount to a half of the working expenses of the NKFM. Their efficient operation will have a favorable influence upon the operation.

(2) Preparation of funds necessary for replacement

The existing facility has been operated in the red because of the public-interest-oriented policy which the rentals should be restricted to lower level. On the other hand, the facilities to be newly built in the Project are planned so that they may keep the balance in the black. However, needless to say, all facilities and equipment have their useful life, and therefore, necessary funds to replace unserviceable facilities and equipment should be accumulated under a long range plan.

(3) Protection of environment

At present the fish caught just before the fishing boat returns to port are landed whole at the jetty, gutted there, and their guts and viscera are thrown away in the sea. They contaminate the seawater around the jetty badly. Discarding guts and viscera should be stopped. It is necessary to establish a common practice to collect them for disposal.

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Chapter 1 Background of the Project

Chapter 1 Background of the Project

1-1 Basic Concept of the Project

As seen in its “Three Years National Development Plan 2001 - 2003”, the Government of St. Vincent and the Grenadines (hereinafter referred to as “SVG”) aims at poverty alleviation through private sector development to reduce income disparities and secure greater food security. In this context, the development of the fishing industry is an important subject because of abundant marine resources, such as large pelagics of dolphin and kingfish, small pelagics of jacks, and various demersals on the continental shelf.

Continuing fisheries assistance from Japan has been contributing heavily to the development of SVG fisheries. The New Kingstown Fish Market (hereinafter referred to as “NKFM”), the proposed Project site, is receiving almost 90% of entire catch in the country and is the biggest fishing base as well as the largest distribution center.

The NKFM is a fish market constructed at Kingstown, the capital of the country, with assistance of Japan in 1987, and has been contributing greatly to production, distribution and export of fish and fishery products in the country. It is widely known to the people not only in SVG but also in neighboring countries, calling “Little Tokyo”, and achieved fame of a model fish market in the Caribbean region.

However, the Fish Market has now difficulty in coping with recent trend for greater demand for wholesome and better quality products at home and abroad because of superannuation of 15 years old. As a result, it became necessary for the fish market to improve hygienic condition in production and distribution of fish and fishery products by the renovation of facilities in order to meet the needs. The followings are problems to awaiting solution.

Table 1-1 Problems at the Fish Market

Facilities	Whole facilities	Leak in the roof (shingling)
		Poor draining
		Possible cross contamination due to no partition in processing area
	Management area	Limited working space due to increasing personnel
		Lack of space for meeting, education or extension service
	Retail area	Unsanitary condition due to worn-out selling counter, drainage, flies and etc.
Social Condition	Safety of fisheries food	Frequent outbreak and poor efficiency due to superannuated machinery
		Insufficient maintenance due to narrow space
		Increasing demands for wholesome food based on changing consumer conscious
		Increasing necessities to meet the international food safety standard

The Ministry of Agriculture Land and Fisheries intend to meet the increasing public and tourism demand for fish and fishery products through improving domestic distribution infrastructure to secure hygienic condition and supplying high value-added primary processed fishery food. At the same time, promotion of export being restricted because of hygienic requirements is also an important subject.

1-2 Contents of Requests

(1) Requested facilities/equipment and established facilities/equipment

The followings are requested items of SVG .

Table 1-2 Requested Items and Confirmed Items

Items		Original Request
Facility	Existing Renovation of Fish Market	1. Renovation of existing floor including draining system
		2. Repair of water plumbing
		3. Installation of air conditioning apparatus
		4. Installation of window, doors and partitions
		5. Construction of roof to cover the existing access/ramp area
		6. Repair of roof and wall
		7. All rooms are enclosed by HACCP Panel System to be modified to Clean Room for food
		8. Removal and installation of retail counter
	Construction of Processing/Lab. Building	(Ground Floor)
		1. Processing space (pretreatment room)
		2. Processing space
		3. Merchandise storage
		4. Carton storage
		5. Ice making/storage
		6. Loading area
		7. Blast freezer
		8. Clothing-changing room; toilet; locker
	Construction of Processing/Lab. Building	(1 st Floor)
		1. Chief Lab. Officer Room
		2. Administration Office
		3. Data Room
		4. Wet Laboratory
		5. Dry Laboratory
		6. Lab. Tech. Room
		7. Lab. Officer Room
		8. Toilet
		9. Preparation Room
		10. Entrance Hall & Corridor etc.
	Equipment and Materials	1. Air blast freezer for domestic, -35
		2. Cold storage for domestic, -25
		3. Chilled storage for domestic, -5
		4. Ice making/storage for outside, 2t flake, 2 sets
		5. Air conditioning system for handling / processing area
		6. Rehabilitation of chilled storage
		7. Rehabilitation of cold storage
		8. Air conditioning system for retail shop area, 25
		9. Rehabilitation of the existing ice storage
		10. Elec. Control system, 1 lot
		11. Miscellaneous, 1 lot

Items		Original Request
Facility	Other Facilities	Stainless steel made water tank Removal of existing tank, newly installation of stainless steel made water tank of 48 ton for replacement of existing and 6 ton elevated tank
		Fisherman's retail shop area Retail shop area for fishermen (allotting 2 booths in Retail area for common use)
		Processed fish product sale area Salted fish sale area (securing in Retail area)
		Car Parking space For transporting / business cars Dumping place Caves for customers one side of the market Boat waiting room Fence and Gate
Equipments	Laboratory	1. Laboratory table
		2. Clean bench
		3. Draft chamber
		4. Histamine analyzer
		5. Spectator photometer for water quality test
		6. Freezer
	Processing	1. HACCP Support Equipment ex.: Processing table, barrows and buckets
	Equipment for Education and Extension Work	1. Projectors
		2. Television set
		3. Video Player
		4. Tape Recorder
		5. Computers
	Data Processing and Managing Equipment	1. Computer
		2. Printer
		3. Scanner
	Others	1. High pressure steam cleaner
		2. Digital weight scales with printer