

JAPAN INTERNATIONAL COOPERATION AGENCY(JICA)

No. 22

NICARAGUA INSTITUTE OF MUNICIPALITY  
FORMATION (INIFOM)  
THE REPUBLIC OF NICARAGUA

社会開発調査部報告書

**THE STUDY ON  
THE IMPROVEMENT OF  
URBAN SANITATION ENVIRONMENT  
OF  
PRINCIPAL CITIES  
IN  
THE REPUBLIC OF NICARAGUA  
(LEON, CHINANDEGA, AND GRANADA)**

**FINAL REPORT  
VOLUME IV**

**ANNEX**

**JANUARY 1998**

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JAPAN INTERNATIONAL COOPERATION AGENCY(JICA)

NICARAGUA INSTITUTE OF MUNICIPALITY  
FORMATION (INIFOM)  
THE REPUBLIC OF NICARAGUA

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(LEON, CHINANDEGA, AND GRANADA)**

**FINAL REPORT**

**VOLUME IV**

**ANNEX**

**JANUARY 1998**

**KOKUSAI KOGYO CO., LTD.**



1142032 (0)

**The Study on the Improvement  
of Urban Sanitation Environment of Principal Cities  
in the Republic of Nicaragua  
(Leon, Chinandega, and Granada)**

**List of Volumes**

- Volume I     Executive Summary
- Volume I(S)   Executive Summary (Spanish Version)
- Volume II     Main Report for the M/P and Conceptual M/Ps
- Volume II(S)   Main Report for the M/P and Conceptual M/Ps (Spanish Version)
- Volume III    Main Report for the Feasibility Study
- Volume III(S)   Main Report for the Feasibility Study (Spanish Version)
- Volume IV    Annex
- Volume V     Data Book

***This is the Annex.***

In this report, the project cost is estimated using the September 1997 price and at an exchange rate of 1US\$ = 120.00 Japanese Yen = 9.60 Cordoba.



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- ANNEX E : Water Pollution Loading Survey (WPLS)**
- ANNEX F : Waste Amount and Composition Survey (WACS)**
- ANNEX G : Industrial Waste Management Survey**
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# ***ANNEX A***

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## ***Minutes of Meeting***



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# A Minutes of Meeting

## A.1 Minutes of Meeting for IC/R, July 18, 1996

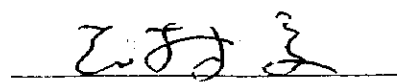
MINUTES OF MEETING  
ON  
THE INCEPTION REPORT  
OF  
THE STUDY ON THE IMPROVEMENT  
OF  
URBAN SANITATION ENVIRONMENT  
OF  
PRINCIPAL CITIES  
IN  
THE REPUBLIC OF NICARAGUA  
(LEON, CHINANDEGA, AND GRANADA)

AGREED UPON BETWEEN  
NICARAGUA INSTITUTE OF MUNICIPALITY FORMATION (INIFOM)  
AND  
JICA STUDY TEAM


Managua, July 18th, 1996



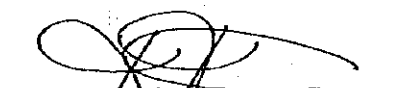
Dr. Santiago RIVAS LECLAIR  
Minister President,  
Nicaragua Institute of  
Municipality Formation (INIFOM)



Mr. Susumu SHIMURA  
Leader of JICA Study Team



Lic. Leonel TELLER  
Chief of Minister's Cabinet  
Director General, Bilateral Management  
Ministry of External Cooperation (MCE)



Mr. Koichiro KATSURAI  
Chairman of JICA Advisory  
Committee

**MINUTES OF MEETING ON THE INCEPTION REPORT OF THE STUDY ON THE IMPROVEMENT OF URBAN SANITATION ENVIRONMENT OF PRINCIPAL CITIES IN THE REPUBLIC OF NICARAGUA (LEON, CHINANDEGA, AND GRANADA)**

**1. INTRODUCTION**

1.1 The Study Team has submitted the Inception Report (English version and Spanish version twenty (20) copies respectively) to the Government of the Republic of Nicaragua. Consequently a series of meetings were held from July 15th to 18th in Managua, Nicaragua to discuss the report submitted. A list of officials attending in the above meetings is given in the Annex-3.

**2. ISSUES AND DECISIONS**

2.1 Various issues were discussed and clarifications on the Inception Report (IC/R) were made. Subsequently appropriate consensus was reached during the meetings. These issues, clarifications and consensus are outlined in the following paragraphs.

**2.2 Title of the Study**

The Study Team proposed to reset the title of the Study from "The Study on Master Plan for Urban Sanitation Environment of Principal Cities in the Republic of Nicaragua (Leon, Chinandega, and Granada)" to "The Study on the Improvement of Urban Sanitation Environment of Principal Cities in the Republic of Nicaragua (Leon, Chinandega, and Granada)". The change was proposed based on the understanding that the Study is not only limited to the formulation of a master plan.

The Nicaraguan side approved the proposal.

**2.3 The Study Area**

The Nicaraguan side requested to expand the boundary of the Study Area from that shown in Figures 1.1, 1.2 and 1.3 of the IC/R. Because many facilities related to the USE (Urban Sanitation Environment) are located outside the boundary and the area outside the boundary is now going to be populated and urban area in 2010 will expand over the boundary.

The Study Team clarified that the Study Area is the present (1995) urban (populated) areas of three cities as shown in the Figures where plans of the services related to the USE will be formulated through the Study, and the sites for the USE facilities, such as sewage treatment plants, final disposal sites, etc., shall be studied, even though they are located outside the boundary.

Although the boundary of the Study Area was defined in the S/W (Scope of Work) for the Study agreed upon between INIFOM and JICA Preparatory Study Team in November 1995, the Team agreed the expansion of it if Nicaraguan side clarify and provide information necessary for the improvement plan of USE, such as the proposed boundary, projected population, etc. to the target year 2010.

#### 2.4 The Study Field

The Team clarified that the Study shall cover the fields of (i) water supply, (ii) storm water/ waste water and (iii) solid waste management of the 3 principal cities.

The Nicaraguan side requested that the river/underground water contamination caused by agricultural activity, such as contamination caused by pesticide, fertilizer, etc., shall be studied.

The Team replied that since the Study does not aim at the analysis of river/underground water contamination mechanism, it is not included. However the river water contamination caused by domestic and industrial waste water will be referred in the Study.

The Nicaraguan side agreed the clarification.

#### 2.5 First Priority City and USE Master Plan

The Team clarified that a priority city will be selected based on the results of the Phase I study, i.e. Basic Study, and that a M/P (master plan) for the improvement of the USE will be formulated only for the selected city and conceptual M/P will be made for the other two cities.

The Nicaraguan side confirmed that the other two cities shall formulate their USE M/P by themselves based on the conceptual M/P utilizing the experience of the M/P for the first priority city. Consequently, the Nicaraguan side requested the Team to support and assist the other two cities for the formulation of their M/P.

The Team suggested the counterpart members of the other two cities to join the weekly meetings to be held at the selected city or INIFOM office in Managua in Phase II and III.

#### 2.6 Sample Number of POS (Public Opinion Survey)

The Nicaraguan side pointed out that the proposed area-wise sample number of the POS may not be representing the proportion of the area categorization of respective cities.

The Team replied that due to the budget and time constraint total number (80 samples for each city) can not be changed, however, area-wise sample number allocation can be changed based on available statistics and discussions between the Team and the relevant officers in each city.

The Nicaraguan side agreed it.

#### 2.7 Cooperation on the Field Investigation

The Team explained that the Phase I study, i.e. Basic Study, is widely diversified and contains a considerably large amount of the field works. Therefore, they proposed that the implementation of the study should be carried out with the co-operation and active participation of the Nicaraguan side, especially regarding the field survey to be conducted in the First Study Work in Nicaragua. In addition, the Team requested the Nicaraguan side to get permission for surveying factories and medical institutions in order to smoothly conduct industrial/medical waste survey.

The Nicaraguan side approved the request.

#### 2.8 Steering Committee

The Nicaraguan side informed that a Steering Committee is established and the members of the committee are given in the Annex-1.

#### 2.9 Technical Committee and Counterpart

The Nicaraguan side informed that the Technical Committee is organized and the members of the committee who are the working counterpart of the Study Team are given in the Annex-2.

#### 2.10 Continuity of the Study

The Team requested the Nicaraguan side to maintain the continuity of their cooperation and assistance for the Study even after the general election to be held October 20th, 1996.

The Nicaraguan side replied that they will do their best efforts on it.



2.11 Counterpart Training in Japan

The Team informed that each Japanese fiscal year (from April to March) a counterpart of the Study Team may have an opportunity to have a training course in Japan, so that the Nicaraguan side should send their request to JICA by August if they like to have the opportunity for this fiscal year (1996).

The Nicaraguan side understood the information.

2.12 Undertaking of the Nicaraguan Side

The Nicaraguan side requested to exclude the term "Assistance for the various field surveys such as questionnaire survey to industries and hospitals" in the page 51 of IC/R.

The Team accepted the request.

2.13 Parameters

The Nicaraguan side requested that the parameters for the WQS (Water Quality Survey) shall be determined together with the Nicaraguan counterpart.

The Team replied that due to the budget and time constraint they could not be changed.

3. CONCLUSION

3.1 With the above clarifications and modification, the IC/R was approved by the Nicaraguan side.

## ANNEX-1

## LIST OF STEERING COMMITTEE

1.- Ana Soledad Román	Directora Ejecutiva	INIFOM.
2.- Gustavo Martínez M.	Ministro Director	INAA.
3.- Emilio Soto	Sub-Director	INETER.
4.- Rosario Hernández	Vice-Ministro	MINSA.
5.- Enrique Brenes	Vice-Ministro	MARENA.
6.- Juan Munguía E.	Alcalde de Chinandega.	
7.- Emilio Montes	Vice-Alcalde de León.	
8.- Luis Chamorro Mora	Alcalde de Granada.	

## ANNEX-2

## LIST OF TECHNICAL COMMITTEE

(Full time member)

1.- Luiz Felipe Correa	Chief of the Counterpart	INIFOM
------------------------	--------------------------	--------

(Part time member)

1.- Marvin Palacios R.	Dir.Des.Urb Y Serv.Mples.	INIFOM
2.- Sergio Tercero	Gerente Norm.Tecn.	INAA.
3.- Luis Zuniga	Dir.Planif.Física	INETER.
4.- Harmodio Paredes	Higiene Alc.de León.	MINSA.
5.- Helio Zamora	Dir.Control de Tóxicos	MARENA.
6.- Ignacio Estrada L.	Resp.Residuos Sólidos	Alc.León.
7.- Gustavo García S.	Dir.Planif.Fis.Y Urb.	Alc.León.
8.- Luis Javier Gutiérrez	Director de Proyecto	Alc.Granada
9.- Gerardo Espinoza	Director de Operación.	Alc.Granada
10.-Presentación Rodríguez	Resp.Medio Ambiente.	Alc.Chinandega
11.-Francisco Blanco	Resp.Serv. Mples	Alc.Chinandega



## ANNEX-3

## LIST OF THE MEETING ATTENDANTS

## Nicaraguan Side

1.-	Emilio Soto	Sub-Director	INETER
2.-	Patricia Silva D.	Dir. Plan. y Proy.	INETER
3.-	Luis Zuniga	Dir. Planif. Fisica	INETER
4.-	Yelba Flores M.	Hidrogeologa	INETER.
5.-	Ma. Dolores Calderón	Hidróloga	INETER.
6.-	Gustavo Martínez M.	Ministro Director	INAA.
7.-	Sergio Tercero T.	Gerente Norm. Tecn.	INAA
8.-	Carlos T. Deshon R.	Director	INAA R-IV
9.-	Sergio Mayorga Soto	Gerente. Gral.	INAA R-II
10.-	Juan Munguía Espinoza	Alcalde	Chinandega
11.-	Emilio Montes E.	Vice-alcalde	León
12.-	Luis Chamorro Mora	Alcalde	Granada
13.-	Ignacio Estrada L.	Resp. Red. Sólidos	León
14.-	Luis Gutiérrez Taleno	Director proyecto	Granada
15.-	Presentación Rodríguez	Respon. Medio Amb.	Alc. de Chinand.
16.-	Gustavo García S.	Dir. Plan. Fis y Urb.	León
17.-	Francisco Blanco	Resp. Serv. Mples	Chinand.
18.-	Gerardo Espinoza R.	Director Operacion.	Alc. Granada.
19.-	Joaquín Valle M	Admon. Rastro	Alc. de Chinand.
20.-	Enrique Brenes.	Vice-Ministro	MARENA.
21.-	Helio Zamora	Dir. Cont. Tóxicos	MARENA-Central.
22.-	Porfirio Paiz M.	Delegado Dptal.	MARENA León.
23.-	Carlos Gómez R.	Delegado Dptal.	MARENA-Granada
24.-	Juan Jacinto Núñez	Delegado Dptal.	MARENA-Chinand.
25.-	Nubia Rosa Aragón	Delegado Munic.	MARENA-Granada.

26.-	Rosa Victoria Mayorga	Delegado Munic.	MARENA-Chinand.
27.-	Nubia Largaespada m.	Directora General	MINSA.
28.-	Harmodio Paredes	Higiene	MINSA-León.
29.-	Agustín Guevara	Epidemiólogo	MINSA-Chinande.
30.-	Sara Moraga	Epidemióloga	MINSA-Granada.
31.-	Alejandro Maltez M.	Consultor	JICA-MCE.
32.-	Azarias Chávez	Dir.Coop. Ext.	Chinandega
33.-	Mishiyuki Shimoda	Asesor	JICA-MCE.
34.-	Santiago Rivas L.	Ministro Presidente	INIFOM.
35.-	Ana Soledad Román	Directora Ejecutiva	INIFOM
36.-	Isidro Jirón Cortes.	Delegado Regional	INIFOM R-IV.
37.-	Walter Valladares	Delegado Regional	INIFOM R-II.
38.-	Teresa Suazo M.	Cood. Prog. y Proy.	INIFOM-Central.
39.-	Indiana Cruz	Resp. Serv. Mples	INIFOM R-II
40.-	Marvin Palacios R.	Dir.Des.Urb.y Ser.M.	INIFOM-Central.
41.-	Ma.Asunción Ortega s.	Asesora Ambiental	INIFOM-Central.
42.-	Luis Felipe Pérez	Ex-Alcalde de León.	
43.-	Luis Felipe Correa M.	Coordinador del Proy.	

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ANNEX 3 (Continued)

LIST OF THE MEETING ATTENDANTS

Japanese Side,

JICA Study Team

Mr. Susumu SHIMURA	Leader of JICA Study Team
Mr. Hiroshi KATO	Member of JICA Study Team
Mr. Masaharu KINA	Member of JICA Study Team
Mr. Tadayama YAMAMOTO	Member of JICA Study Team
Mr. Kunio FUJIWARA	Member of JICA Study Team
Miss. Masami HAYASHI	Administrative Coordinator of JICA Study Team

JICA Advisory Committee for the Study

Mr. Koichiro KATSURAI	Chairman of Committee
Mr. Koken KONOTOH	Member of Committee

JICA Headquarters

Mr. Nobuaki MIYATA	Staff, Second Development Study Division, Social Development Study Department, JICA
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Embassy of Japan

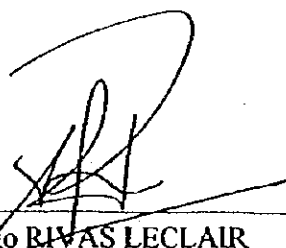
Mr. Satoshi UEMATSU	Second Secretary
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**A.2 Minutes of Meeting for P/R (1), October 18, 1996**

**MINUTES OF MEETING  
ON  
THE PROGRESS REPORT (I)  
OF  
THE STUDY ON THE IMPROVEMENT  
OF  
URBAN SANITATION ENVIRONMENT  
OF  
PRINCIPAL CITIES  
IN  
THE REPUBLIC OF NICARAGUA  
(LEON, CHINANDEGA, AND GRANADA)**

**AGREED UPON BETWEEN  
NICARAGUA INSTITUTE OF MUNICIPALITY FORMATION (INIFOM)  
AND  
JICA STUDY TEAM**

Managua, October 18th, 1996



Dr. Santiago RIVAS LECLAIR  
Minister President,  
NICARAGUA INSTITUTE OF  
MUNICIPALITY FORMATION (INIFOM)



Mr. Susumu SHIMURA  
Leader of JICA Study Team

**MINUTES OF MEETING ON THE PROGRESS REPORT (1) OF THE STUDY ON  
THE IMPROVEMENT OF URBAN SANITATION ENVIRONMENT OF  
PRINCIPAL CITIES IN THE REPUBLIC OF NICARAGUA  
(LEON, CHINANDEGA, AND GRANADA)**

**1. INTRODUCTION**

1.1 The Study Team has submitted the Progress Report (English version and Spanish version of summary 20 copies) to the Government of the Republic of Nicaragua. Consequently a series of meetings were held from July 9<sup>th</sup> to 15<sup>th</sup> in Managua, Nicaragua to discuss the report submitted. A list of officials attending in the above meetings is given in the Appendix 1.

**2. ISSUES AND DECISIONS**

2.1 Various issues were discussed and clarifications on the Progress Report (P/R) (1) were made. Subsequently appropriate consensus was reached during the meetings. These issues, clarifications and consensus are outlined in the following paragraphs.

**2.2 Comments on P/R (1)**

The Study Team requested the Nicaraguan side to give their comments on the P/R (1) by the 23 of October to INIFOM in Managua.

The Nicaraguan side accepted the request.

**2.3 Schedule of the Discussion Meeting on Interim Report**

The Nicaraguan side requested to change the schedule of the discussion meeting on Interim Report (IT/R) which will be held in the mid-January, 1997 due to the administrative transformation of the central and local governments after the election. They proposed to have the meeting in the last week of January, 1997.

The Study Team replied they will convey the request to JICA headquarters.

**2.4 Hospital Waste Water**

The Nicaraguan side requested that the adverse impacts of the current hospital waste water on the environment shall be studied.

The Study Team replied they will convey the request to JICA headquarters.

2.5 Point Weighting of Evaluation

The Team clarified that a priority city will be selected based on the following point weighting of evaluation:

Planning Aspects:	50
Economic Aspects:	20
Social Aspects:	20
Implementation Aspects:	10
<hr/>	
Total:	100

The Nicaraguan side approved it.



3. CONCLUSION

3.1 With the above clarifications and modification, the IC/R was approved by the Nicaraguan side.



ANNEX I

On the Nicaraguan side:

Steering and Technical Committee

Dr. Juan Munguía	Alcalde de Chinandega
Lic. Emilio Montes	Vice-Alcalde de León
Lic. Ana Soledad Román	INIFOM
Sr. César Correa	Consejal de Granada
Ing. Sergio Tercero	INAA - Managua
Ing. Carlos Deshon	INAA - IV Región
Ing. Gerardo Espinoza	Alcaldía - Granada
Dra. Sara Moraga	SILAIS - Granada
Ing. Sergio Mayorga	INAA - II Región
Sr. Ignacio Estrada	Alcaldía - León
Sr. Gustavo García	Alcaldía - León
Ing. Harmodio Paredes	MINSAs - León
Lic. Azarías Chávez	Alcaldía - Chinandega
Lic. Presentación Rodríguez	Alcaldía - Chinandega
Sr. Francisco Blanco	Alcaldía - Chinandega
Mie Ito	Japanese Volunteer (Alcaldía - Chinandega)
Makiko Fujiwara	Japanese Volunteer (Alcaldía - Chinandega)
Kazuhiro Samada	Japanese Volunteer (Alcaldía - Chinandega)
Dr. Juan José Amador	MINSAs - Managua
Ing. Maritza Obando	MINSAs - Managua
Arq. Marvin Palacios	INIFOM - Central
Ing. Ma. Asunción Ortega S.	INIFOM - Central

Project Coordination

Ing. Guillermo Guevara  
Dr. José Zepeda  
Lic. Lucrecia Suárez



On the Japanese side

Members of the JICA Team

Sr. Susumu Shimura

Leader of the JICA Team

Sr. Tadayama Yamamoto

Member of the JICA Team

Sr. Hiroshi Kato

Member of the JICA Team

Sr. Ikuo Mori

Member of the JICA Team

Sr. Kozo Baba

Member of the JICA Team

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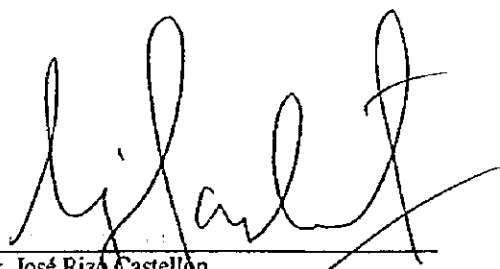


A.3 Minutes of Meeting for IT/R (1), January 30, 1997

MINUTES OF MEETING  
ON  
THE INTERIM REPORT (1)  
OF  
THE STUDY ON THE IMPROVEMENT  
OF  
URBAN SANITATION ENVIRONMENT  
OF  
PRINCIPAL CITIES  
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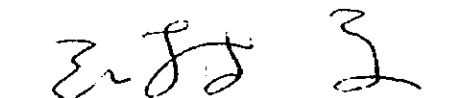
AGREED UPON BETWEEN  
NICARAGUA INSTITUTE OF MUNICIPALITY FORMATION (INIFOM)  
AND  
JICA STUDY TEAM

Managua, January 30th, 1997



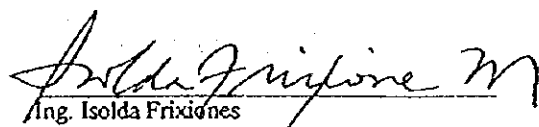
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Dr. José Rizo Castellón  
Minister President,  
NICARAGUA INSTITUTE OF  
MUNICIPALITY FORMATION (INIFOM)



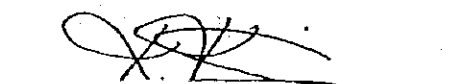
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Mr. Susumu SHIMURA  
Leader of JICA Study Team



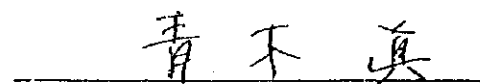
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Ing. Isolda Frixiones  
Director General (a.i.)  
Bilateral Management  
Ministry of External Cooperation (MCE)



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Mr. Koichiro KATSURAI  
Chairman of JICA Advisory Committee



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Mr. Makoto AOKI  
Director, Second Development Study Division  
Social Development Study Department, JICA

**MINUTES OF MEETING ON THE INTERIM REPORT (1) OF THE STUDY ON  
THE IMPROVEMENT OF URBAN SANITATION ENVIRONMENT OF  
PRINCIPAL CITIES IN THE REPUBLIC OF NICARAGUA  
(LEON, CHINANDEGA, AND GRANADA)**

**1. INTRODUCTION**

- 1.1 The Study Team has submitted the Interim Report (1) (English version main report and Spanish version summary 20 copies respectively) to the Government of the Republic of Nicaragua. Consequently a series of meetings were held from January 22<sup>nd</sup> to 27<sup>th</sup> in Managua, Nicaragua to discuss the report submitted. A list of officials attending in the above meetings is given in the Appendix 1.

**2. ISSUES AND DECISIONS**

- 2.1 Various issues were discussed and clarifications on the Interim Report (IT/R) (1) were made. Subsequently appropriate consensus was reached during the meetings. These issues, clarifications and consensus are outlined in the following paragraphs.

**2.2 Continuity of the Study**

Although new regimes have been established both in central and local governments, the Study Team requested the Nicaraguan side to maintain the continuity of their cooperation and assistance for the Study, especially to maintain counterparts for the technical aspects (i.e. technical committee members) as many as possible.

The Nicaraguan side replied that they will do their best efforts on it.

**2.3 Members of Steering Committee and Technical Committee**

The Nicaraguan side informed that, according to the establishment of the new regimes of both central and local governments, members of the Steering Committee and Technical Committee for the Study as of January 27<sup>th</sup> 1997 were named as given in Appendix 2 and Appendix 3.

**2.4 Selection of the First Priority City**

The Study Team informed the Nicaraguan side that the city of Granada was selected as the First Priority City (FPC) through the detailed examination based on the selection criteria as explained in the IT/R (1), and they will formulate an urban

sanitation environment (USE) improvement master plan (M/P) for Granada and conceptual M/Ps for Leon and Chinandega by the beginning of June 1997.

The Nicaraguan side approved the selection of the FPC and expressed their intention of continuous cooperation for the Study. In addition, Nicaraguan side inquired the Study Team whether or not there are any possibility that the Study might formulate M/P and F/S for Leon and Chinandega in the future.

The Study Team replied that formulation of M/P and execution of F/S by the Study shall be limited to the city of Granada, and recommended that Leon city and Chinandega city should by themselves formulate M/P and execute F/S for their city based on the conceptual M/P formulated by the Team and empirical input gained (along with participation in the Study for Granada) by the Technical Committee members from the two cities.

The mayors of Leon and Chinandega expressed their strong intention of formulating M/P and executing F/S regarding solid waste management by themselves.

## 2.5 Candidate Sites for future Municipal Solid Waste Landfill and Sewage Treatment Plants for Granada City

Since formulation of the M/P includes the selection of the sites for a municipal solid waste landfill and sewage treatment plant(s) in Granada, the Study Team requested the Nicaraguan side to present candidate sites by February 5<sup>th</sup>, 1997, so that the Team will conduct preliminary surveys of the sites, selection of the site(s) for feasibility study and clarification of the investigations for the 3<sup>rd</sup> Work in Nicaragua.

The Nicaraguan side approved the request. In addition, the mayor of Granada informed that they will provide an office in Granada for the Study Team.

## 2.6 Correction of the IT/R (1)

Discussion among the counterpart and the Team concluded the change of the expression in the "Section 6.2.3 Storm Water Management" of the Summary text as follows.

Original expression from the 3<sup>rd</sup> line of the 2<sup>nd</sup> paragraph to the 1<sup>st</sup> line of the 3<sup>rd</sup> paragraph in the Section 6.2.3 in page S-30 being:

"Clear definition of responsibility between INAA and the municipality, and/or

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integrated cooperation by two bodies, with regard to storm water management, should be established immediately.

Since the "ambiguity" of responsibility presently leads to:

shall be changed as follows:

"Facilitation of actions to be taken between INAA and the municipality, and/or integrated cooperation by two bodies, with regard to storm water management, should be programmed immediately.

Although legislation gives clear definition of respinsibility between INAA and the municipality, 3 cities face a set of problems as follows."

### 3. CONCLUSION

3.1 With the above clarifications and modification, the IT/R (1) was approved by the Nicaraguan side.

**List of the Meeting Attendants**

**Nicaraguan side**

- |                           |  |  |                 |
|---------------------------|--|--|-----------------|
| 1. INIFOM                 |  |  |                 |
| Dr. José Rizo Castellón   | Minister                               |  | INIFOM          |
| Lic. Cristian Matus       | Executive Director                     |  | INIFOM          |
| Arq. Marvin Palacios      | Director, Urban Dev. & Muni. Serv.     |  | INIFOM, Managua |
| Ing. Asunción Ortega      | Urban Dev. & Muni. Serv.               |  | INIFOM, Managua |
| Ing. Guillermo Guevara    | Coordinator for the Study              |  | INIFOM, Managua |
| 2. INAA                   |  |  |                 |
| Ing. Sergio Tercero T.    | Manager, Technical Standard            |  | INAA, Managua   |
| Ing. Carlos Valle G.      | Advisor                                |  | INAA, Managua   |
| Ing. Teodoro Deshon       | Manager, Region IV                     |  | INAA, Granada   |
| Ing. Guillermo Correa C.  | Technical Department, Region IV        |  | INAA, Granada   |
| 3. INETER                 |  |  |                 |
| Ing. Adolfo Tórrez R.     | Vice-minister                          |  | INETER          |
| Ing. Luis Zuniga M..      | Director, Physical Planning            |  | INETER, Managua |
| 4. MINSA                  |  |  |                 |
| Dr. Juan José Amador      | Director Gral. Hygiene & Epidim.       |  | MINSA, Managua  |
| Ing. Maritza Obando       | Communal Hygiene                       |  | MINSA, Managua  |
| 5. MARENA                 |  |  |                 |
| Ing. Leonel Wheelock      | Minister's Technical Advisor           |  | MARENA          |
| Ing. Helio C. Zamora      | Director, Toxicity Control             |  | MARENA, Managua |
| 6. Leon City              |  |  |                 |
| Lic. Rigoberto H. Sampson | Mayor                                  |  |                 |
| Arq. Gustavo García       | Director, City Planning                |  |                 |
| Ing. Ignacio Estrada      | Responsible for Solid Waste Management |  |                 |
| Ing. Harmodio Paredes     | Responsible for Hygiene                |  |                 |

7. Chinaidaga City  
 Lic. Rodolfo Grios H. Mayor  
 Lic. Azaríaz Chavez Director, External Cooperation  
 Ing. Presentación Rodríguez Responsible for Environment  
 Sr. Francisco Blanco Responsible for Municipal Services  
 Sr. Fernando Berríos O. Responsible for Public Cleaning  
 Sr. Francisco Xavier B. Responsible for Municipal Services
8. Granada City  
 Lic. Tatiana Raskoski Mayor  
 Lic. Marisa de Pasos Director, External Relation  
 Ing. Luis Javier Gutiérrez Director, Project  
 Ing. Gerardo Espinoza Director, Operation  
 Dra. Sara Moraga Amador Epidemics (SILAIS, Granada)





Appendix 1 (continued)

Japanese Side

1. JICA Study Team
  - Susumu SHIMURA Leader of JICA Study Team
  - Hiroshi KATO Member of JICA Study Team
  - Tadaya YAMAMOTO Member of JICA Study Team
  - Masaharu KINA Member of JICA Study Team
  - José Felício HADDAD Member of JICA Study Team
  - Ernani de Souza COSTA Member of JICA Study Team
  - Masami HAYASHI Administrative Coordinator of JICA Study Team
  - Atsuko YOSHIKAWA Translator
  
2. JICA Advisory Committee for the Study
  - Koichiro KATSURAI Chairman of the JICA Advisory Committee
  - Kohken KOHNOTOH Member of the JICA Advisory Committee
  - Tomohiko ISHIKURO Member of the JICA Advisory Committee
  
3. JICA Headquarters
  - Makoto AOKI Director, Second Development Study Division,  
Social Development Study Department, JICA
  - Ken-ichi TANAKA Development Specialist, JICA
  - Dai MASUDA Staff, Second Development Study Division,  
Social Development Study Department, JICA



Appendix 2

**Member of the Steering Committee**

1.	Lic. Cristian Matus	INIFOM	Executive Director
2.	Arq. Róger Solórzano Marín	INAA	Minister
3.	Ing. Adolfo Tórrez	INETER	Vice-minister
4.	Dr. Federico Prado	MINSA	Vice-minister
5.	Lic. Roberto Standtdhagen	MARENA	Minister
6.	Lic. Rigoberto H. Sampson	Leon	Mayor
7.	Lic. Rodolfo Grios H.	Chinandega	Mayor
8.	Lic. Tatiana Raskoski	Granada	Mayor

Appendix 3

**Member of the Technical Committee**

1. INIFOM
  - Arq. Marvin Palacio Rodriguez
  - Ing. Asuncion Ortega S.
2. INAA
  - Ing. Sergio Tercero
  - Ing. Sergio Mayorga
  - Ing. Carlos T. Deshon
3. INETER
  - Ing. Luis Zuniga
4. MINSA
  - Dr. Juan Jose Amador
  - Ing. Maritza Obando
5. MARENA
  - Ing. Helio C. Zamora
6. Leon City
  - Arq. Gustavo Garcia
  - Ing. Ignacio Estrada
  - Ing. Harmodio Paredes
7. Chinandega City
  - Lic. Azarias I. Chaves F.
  - Ing. Presentacion Rodriguez
  - Francisco Blanco
8. Granada City
  - Marisa de Pasos
  - Ing. Geraldo Espinoza
  - Ing. Luis Javier Gutierrez

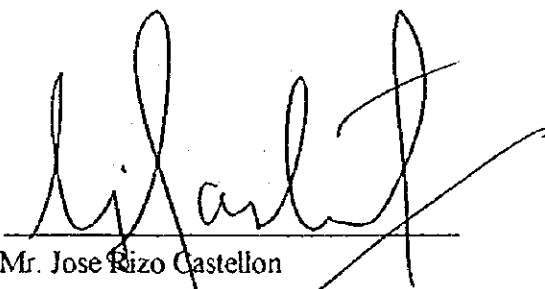


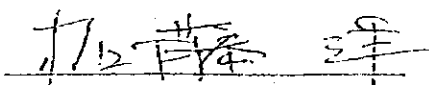
**A.4 Minutes of Meeting for P/R (2), March 24, 1997**

**MINUTES OF MEETING  
ON  
THE PROGRESS REPORT (2)  
OF  
THE STUDY ON THE IMPROVEMENT  
OF  
URBAN SANITATION ENVIRONMENT  
OF  
PRINCIPAL CITIES  
IN  
THE REPUBLIC OF NICARAGUA  
(LEON, CHINANDEGA, AND GRANADA)**

**AGREED UPON BETWEEN  
NICARAGUA INSTITUTE OF MUNICIPALITY FORMATION (INIFOM)  
AND  
JICA STUDY TEAM**

Managua, March 24<sup>th</sup>, 1997

  
\_\_\_\_\_  
Mr. Jose Rizo Castellon  
Minister President,  
NICARAGUA INSTITUTE OF  
MUNICIPALITY FORMATION (INIFOM)

  
\_\_\_\_\_  
Mr. Hiroshi KATO  
for Leader of JICA Study Team

**MINUTES OF MEETING ON THE PROGRESS REPORT (2) OF THE STUDY ON  
THE IMPROVEMENT OF URBAN SANITATION ENVIRONMENT OF  
PRINCIPAL CITIES IN THE REPUBLIC OF NICARAGUA  
(LEON, CHINANDEGA, AND GRANADA)**

**1. INTRODUCTION**

- 1.1 The Study Team has submitted the Progress Report (2) (English version and Spanish version of summary 20 copies) to the Government of the Republic of Nicaragua. Consequently a series of meetings were held March 20<sup>th</sup> and 21<sup>st</sup> in Managua, Nicaragua to discuss the report submitted. A list of officials attending in the above meetings is given in the Appendix 1.

**2. ISSUES AND DECISIONS**

- 2.1 Various issues were discussed and clarifications on the Progress Report (P/R) (2) were made. Subsequently appropriate consensus was reached during the meetings. These issues, clarifications and consensus are outlined in the following paragraphs.

**2.2 Comments on the P/R (2)**

The USE improvement master plan (M/P) for Granada as well as conceptual M/Ps for Leon and Chinandega will be formulated during the 2nd Study Work in Japan, from beginning of April to end of May, 1997. In order to reach a certain consensus between Nicaraguan side and the Study Team, the Team submitted the P/R (2) which presents a draft outline of the M/P and conceptual M/Ps. The Team requested the Nicaraguan side to give their comments on the P/R (2) by 11<sup>th</sup> April 1997 to the Team, especially regarding the planning frameworks for the M/P and conceptual M/Ps.

The Nicaraguan side approved the request.

**2.3 Site Selection of Future Landfill subject to F/S**

In the initial stage of the Phase II of the Study, Granada municipality presented 2 sites ("Buena Vista" and "San Jose de la Viuda") as candidate sites for a future landfill.

Team conducted a comparative evaluation of the 2 candidate sites based on the Team's investigation and the data and information available. In this consequence, Team proposed the candidate site "San Jose de la Viuda" be subject to F/S.

Meanwhile, Granada municipality should decide which of the 2 sites should be selected as the site subject to F/S, in reviewing Team's evaluation and considering the intrinsic situation of the city. In this context, Granada replied that the selection of the site shall be informed from Granada municipality to the Team on or before 11<sup>th</sup> April 1997, after the carefully examination.

Team accepted the date of 11<sup>th</sup> April 1997.

Granada municipality replied that in other case they will take necessary actions for the Team's request as follows:

1. assurance of the land acquisition possibility and its exact location with boundaries of the site available; and
2. attainment of permission to enter the site and to conduct the necessary surveys at the site in the 3<sup>rd</sup> Study Work in Nicaragua between June 1997 and August 1997.

Team requested that the municipality's judgement reasons for the decision would like to be informed to the Team in order to improve the F/S, especially if Granada selects the other site "Buena Vista". Since the Team should, in advance, seek best answers of technical options to respond the municipality's judgement criteria.

Granada city accepted the Team's request.

#### 2.4 Pilot Project(s)

Although the implementation of the pilot projects is subject to the approval of JICA headquarters, the Study Team requested the Nicaraguan side to actively cooperate and participate in the pilot projects if JICA approves the pilot projects and allocates a budget for them.

The Nicaraguan side replied that they sincerely wish to implement the proposed pilot projects for the reinforcement of the current urban sanitation environment (USE) management in Granada and they will actively cooperate in these projects.

#### 2.5 Time schedule of the Study

Where 5 possible components of the pilot projects are proposed and/or requested. Since some of the pilot projects require longer time for its implementation, Team proposed an extension of 1.0 calendar month for the 3<sup>rd</sup> Study Work in Nicaragua

although it is subject to JICA's approval. Team further explained when Nicaraguan side approves the Team's proposal, time schedule of Phase III will be as follows:

- the 3<sup>rd</sup> Study Work in Nicaragua (June to August 1997);
- the 3<sup>rd</sup> Study Work in Japan (September to October 1997);
- the 4<sup>th</sup> Study Work in Nicaragua (November 1997); and
- the 4<sup>th</sup> Study Work in Japan (December 1997).

Nicaraguan side approved and recommended the 1.0 month extension and succeeding shift of the Study schedule.

### 3. CONCLUSION

- 3.1 With the above clarifications and modification, the P/R (2) was approved by the Nicaraguan side.



## List of the Meeting Attendants

## Nicaraguan side

1. INIFOM
 

Lic. Cristian Matus	Executive Director	INIFOM
Arq. Marvin Palacios	Director, Urban Dev. & Muni. Serv.	INIFOM, Managua
Ing. Asunción Ortega	Urban Dev. & Muni. Serv.	INIFOM, Managua
Ing. Guillermo Guevara	Coordinator for the Study	INIFOM, Managua
  
2. INAA
 

Ing. Jorge Hayn Vogl	Vice-minister	INAA
Ing. Sergio Tercero T.	Manager, Technical Standard	INAA, Managua
Ing. Guillermo Correa C.	Technical Department, Region IV	INAA, Granada
  
3. INETER
 

Ing. Luis Zuniga M..	Director, Physical Planning	INETER, Managua
----------------------	-----------------------------	-----------------
  
4. MINSa
 

Dr. Humberto Castillo	Delegated by Vice-minister	MINSa
Ing. Maritza Obando	Communal Hygiene	MINSa, Managua
  
5. Leon city
 

Ing. Denis Perez Ayerdis	Municipal Manager	
Arq. Gustavo Garcia	Director, City Planning	
Ing. Ignacio Estrada	Responsible for Solid Waste Management	
Ing. Harmodio Paredes	Responsible for Hygiene	
  
6. Chinandega City
 

Lic. Rodolfo Griós H.	Mayor	
Lic. Azariáz Chavez	Director, External Cooperation	
Ing. Presentación Rodríguez	Responsible for Environment	
Sr. Francisco Blanco	Responsible for Municipal Services	
Sr. Fernando Berrios O.	Responsible for Public Cleaning	

7. Granada City

Lic. Tatiana Raskoski

Mayor

Lic. Marisa de Pasos

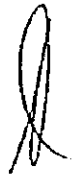
Director, External Relation

Ing. Luis Javier Gutiérrez

Director, Project

Ing. Gerardo Espinoza

Director, Operation



Japanese Side

1. JICA Study Team

Hiroshi KATO

Member of JICA Study Team

Tadaya YAMAMOTO

Member of JICA Study Team

Takeshi TOMIYASSU

Member of JICA Study Team

Kozo BABA

Member of JICA Study Team

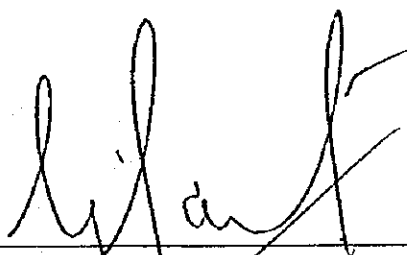
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**A.5 Minutes of Meeting for IT/R (2), June 13, 1997**

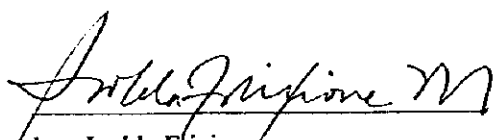
**MINUTES OF MEETING  
ON  
THE INTERIM REPORT (2)  
OF  
THE STUDY ON THE IMPROVEMENT  
OF  
URBAN SANITATION ENVIRONMENT  
OF  
PRINCIPAL CITIES  
IN  
THE REPUBLIC OF NICARAGUA  
(LEON, CHINANDEGA, AND GRANADA)**

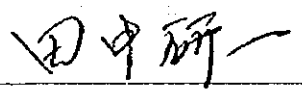
**AGREED UPON BETWEEN  
NICARAGUA INSTITUTE OF MUNICIPALITY FORMATION (INIFOM)  
AND  
JICA STUDY TEAM**

Managua, June 13th, 1997

  
\_\_\_\_\_  
Dr. José Rizo Castellón  
Minister President,  
NICARAGUA INSTITUTE OF  
MUNICIPALITY FORMATION (INIFOM)

  
\_\_\_\_\_  
Mr. Susumu SHIMURA  
Leader of JICA Study Team

  
\_\_\_\_\_  
Ing. Isolda Frixiones  
Director General (a.i.) Bilateral Management  
Ministry of External Cooperation (MCE)

  
\_\_\_\_\_  
Mr. Ken-ichi TANAKA  
Chairman of JICA Advisory  
Committee

**MINUTES OF MEETING ON THE INTERIM REPORT (2) OF THE STUDY ON  
THE IMPROVEMENT OF URBAN SANITATION ENVIRONMENT OF  
PRINCIPAL CITIES IN THE REPUBLIC OF NICARAGUA  
(LEON, CHINANDEGA, AND GRANADA)**

**1. INTRODUCTION**

- 1.1 The Study Team has submitted the Interim Report (2) (English version of main report and Spanish version of summary 20 copies respectively) to the Government of the Republic of Nicaragua. Consequently a series of meetings were held from June 6th and 12th in Managua, Nicaragua to discuss the report submitted. A list of officials attending in the above meetings is given in the Appendix 1.

**2. ISSUES AND DECISIONS**

- 2.1 Various issues were discussed and clarifications on the Interim Report (IT/R) (2) were made. Subsequently appropriate consensus was reached during the meetings. These issues, clarifications and consensus are outlined in the following paragraphs.

**2.2 On-site Investigation of the New Landfill Candidate Site**

The Study Team informed that F/S for the construction of the new landfill in San Jose de la Viuda site is carried out in Phase III of the Study; namely a set of on-site investigations (topographic survey, geological survey, environmental survey, etc.) for the site are to be carried out in the 3rd Study Work in Nicaragua (from middle of June 1997). Therefore, the Team requested that Granada municipality should ensure the following for the on-site investigation at the proposed site, in advance:

1. assurance of land acquisition possibility and exact location with boundaries of the candidate site available;
2. attainment of permissions to enter the site for conducting geological, topographical and environmental surveys.

The Granada municipality approved the request.





**2.3 On-site Investigation of the Area for Model Communities Integrated USE (Urban Sanitation Environment) Improvement Plan**

The Study Team informed that F/S for the "Model Communities Integrated USE Improvement Plan" is carried out in Phase III of the Study; namely a topographic survey for the Model area (including survey of house layout in each premises) is to be carried out in the 3rd Study Work in Nicaragua (from middle of June 1997). Therefore, the Team requested that Granada municipality should ensure the attainment of permission to enter the Model area for conducting topographic survey.

The Granada municipality approved the request.

**2.4 Pilot Projects**

Since JICA approved the implementation of the five (5) pilot projects and allocated a budget for it, the Study Team requested the Nicaraguan side to actively co-operate and participate in the projects according to the role assignment described in the table below:

**Table 1: Responsibilities for the Pilot Projects**

Pilot Project	Nicaraguan Side	Team
Beautify Granada Campaign	<ul style="list-style-type: none"> <li>Planning and design of signboard, poster, sticker, seminar/workshop.</li> <li>To provide speaker car and to implement the public campaign activities.</li> <li>To implement seminars and workshops on sanitary education.</li> </ul>	<ul style="list-style-type: none"> <li>To support the planning and design to be prepared by the Nicaraguan side.</li> <li>To provide signboard, poster, sticker.</li> <li>To support the arrangement of seminars and workshops on sanitary education.</li> <li>To implement questionnaire surveys before and after the experiments.</li> </ul>
Experiment on Improvement of Refuse Collection System (Eddy Ruiz III)	<ul style="list-style-type: none"> <li>To provide speaker car and to implement the public campaign activities.</li> <li>To request community cooperation for placing waste at designated location.</li> <li>To provide regular waste collection services for the area.</li> <li>To bear cost for operation and maintenance of the tipper lorry provided for the experiment (including fuel).</li> </ul>	<ul style="list-style-type: none"> <li>To prepare a plan of Eddy Ruiz III refuse collection improvement.</li> <li>To provide a waste collection vehicle and waste containers.</li> <li>To construct of waste collection bays.</li> <li>To implement questionnaire surveys before and after the experiments.</li> </ul>
Experiment on Improvement of Arroyo Zacateligue Sanitation Environment	<ul style="list-style-type: none"> <li>To provide speaker car and to implement the public campaign activities.</li> <li>To request community cooperation for placing waste at designated location instead of illegal dumping.</li> </ul>	<ul style="list-style-type: none"> <li>To prepare plans of "illegal dumping areas improvement" and "refuse collection improvement".</li> <li>To provide a waste collection vehicle (co-use with Eddy Ruiz III) and waste containers.</li> </ul>

Pilot Project	Nicaraguan Side	Team
	<ul style="list-style-type: none"> <li>To enforce monitoring and restriction to prevent illegal dumping.</li> <li>To provide regular waste collection services for the area.</li> </ul>	<ul style="list-style-type: none"> <li>To remove illegal wastes dumped and to construct waste collection bays.</li> <li>To implement questionnaire surveys before and after the experiments.</li> </ul>
Experiment on Sanitary Landfill Operation at La Joya Disposal Site	<ul style="list-style-type: none"> <li>To implement public campaign regarding the sanitary landfill experiment.</li> <li>To control vehicles entering the site and their waste disposal at the site.</li> <li>To continue sanitary landfill operation after the improvement (after September 1997).</li> </ul>	<ul style="list-style-type: none"> <li>To implement works of urgent improvement for the present La Joya disposal site and works of environmental protection.</li> <li>To prepare a manual of sanitary landfill operation.</li> <li>To implement questionnaire surveys before and after the experiments.</li> </ul>
Experiment on Sullage Collective Treatment System	<ul style="list-style-type: none"> <li>To acquire the land for the facility construction (Reparto Adelita II).</li> <li>To obtain permits for the works.</li> <li>To formulate and obtain a consensus from the community for connecting the sullage generated to the treatment system and a consensus regarding operation and maintenance of the system.</li> <li>Operation/maintenance and monitoring of the experimental system. Results of the monitoring should be presented at the technology transfer seminar in 4th Study Work in Nicaragua.</li> <li>Connection of sullage from houses subject to the experiment.</li> <li>To prepare a plan of community participation for construction, operation and maintenance of the sullage collective treatment system.</li> </ul>	<ul style="list-style-type: none"> <li>To construct sewer lines for the experiment</li> <li>To plan, design and construct the sullage collective treatment system.</li> <li>To examine optimum operation and maintenance measures and to prepare the manual.</li> <li>To support planning of "community participation system" for the construction, operation and maintenance of the sullage collective treatment system.</li> <li>To implement questionnaire surveys before and after the experiments.</li> </ul>

The Nicaraguan side replied that they will actively co-operate in these projects.

## 2.5 Correction of the IT/R (2)

Discussion among the counterpart and the Team concluded the addition of the expression in the "Section 3.1.1.c and 4.1.1.c Strategies for Urban Sanitation Environment (USE) Conceptual Master Plan for Leon and Chinandega" of the Summary text as follows.

### **c. Strategies**

Strategic actions to reach the goals and targets should, in practice, be deployed in a stepwise manner toward the target year 2010. Therefore, it is recommended herewith to divide the period to the target year 2010 into 3 phases.

The following strategies are prepared based on the assumption that Leon (or Chinandega in case of Section 4.1.1.c) Municipality shall formulate her USE Master Plan and carry out feasibility study for priority projects identified in the M/P by year 2000.

#### **2.6 Delivery of the Reports**

The Nicaraguan side requested the Study Team that during the Phase III, the reports should be delivered to the counterpart one week in advance to technical/steering committee meetings in order to give them enough time to produce comments.

The Team replied that they will directly deliver the reports (not in the form of a book but a copy) to each counterpart at least five days before the meetings.

The Nicaraguan side agreed it.

#### **2.7 Technology Transfer Seminar**

The Nicaraguan side requested the Study Team that two months in advance the contents of the technology transfer seminar should be informed to the counterpart in order to produce their comments and suggestions on the contents.

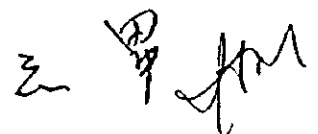
The Team replied that they will discuss the contents in the middle of August.

The Nicaraguan side agreed it.

#### **2.8 Weekly Schedule of the Study**

The Nicaraguan side requested the Study Team that during the 3<sup>rd</sup> Study Work in Nicaragua, in order to make the co-operation/co-ordination of the counterpart with the Team more efficient the Team shall inform their weekly schedule to the counterpart in advance.

The Team replied that they will inform tentative schedule of next week on Fridays to the chief counterpart.



The Nicaraguan side agreed it.

3. **CONCLUSION**

- 3.1 With the above clarifications and modification, the IT/R (2) was approved by the Nicaraguan side.



## List of the Meeting Attendants

## Nicaraguan side

- |    |                             |  |                 |
|----|-----------------------------|--|-----------------|
| 1. | INIFOM                      |  |                 |
|    | Dr. José Rizo Castellón     | Minister                               | INIFOM          |
|    | Lic. Cristian Matus         | Executive Director                     | INIFOM          |
|    | Arq. Marvin Palacios        | Director, Urban Dev. & Muni. Serv.     | INIFOM, Managua |
|    | Ing. Asunción Ortega        | Urban Dev. & Municipal Service         | INIFOM, Managua |
|    | Ing. Guillermo Guevara      | Coordinator for the Study              | INIFOM, Managua |
| 2. | INAA                        |  |                 |
|    | Ing. Guillenno Leclair G.   | Manager of Planning                    | INAA, Managua   |
|    | Lic. Ramiro Castillo Cantón | Delegated, Region II                   | INAA, Region II |
|    | Ing. Francisco Moreno       | Technical Manager, Region II           | INAA, Region II |
|    | Ing. Carlos Teodoro Deshon  | Manager, Region IV                     | INAA, Region IV |
|    | Ing. Guillermo Correa C.    | Technical Manager, Region IV           | INAA, Region IV |
| 3. | INETER                      |  |                 |
|    | Ing. Adolfo Tórrez R.       | Sub-director                           | INETER          |
| 4. | MARENA                      |  |                 |
|    | Lic. Jacqueline Membreño G. | Sub-director General Dir. of Environ.  | MARENA          |
|    | Lic. Lesbia Aguilar G.      | Director (a.i) Toxicity Control        | MARENA          |
| 5. | Leon City                   |  |                 |
|    | Lic. Ramón Delgado B.       | Sub-director, External Cooperation     |                 |
|    | Arq. Gustavo García         | Director, City Planning                |                 |
|    | Ing. Ignacio Estrada        | Responsible for Solid Waste Management |                 |
|    | Ing. Harmodio Paredes       | Responsible for Hygiene                |                 |
| 6. | Chinandega City             |  |                 |
|    | Lic. Azarías Chavez         | Director, External Cooperation         |                 |
|    | Lic. Presentación Rodríguez | Responsible for Environment            |                 |
|    | Sr. Francisco Blanco        | Responsible for Municipal Services     |                 |
|    | Sr. Fernando Berrios O.     | Responsible for Public Cleaning        |                 |

7. Granada City  
 Lic. Ivania de Barberena                      Manager, Finance Administration  
 Ing. Luis Javier Gutiérrez                      Director, Project  
 Ing. Gerardo Espinoza                          Director, Operation
8. Ministry of External Cooperation  
 Lic. Minoru Arimoto                              Expert  
 Lic. Alejandro Maltez                            Advisor for Japan projects

**Japanese Side**

1. JICA Study Team  
 Susumu SHIMURA                              Leader of JICA Study Team  
 Hiroshi KATO                                      Member of JICA Study Team  
 Tadayama YAMAMOTO                          Member of JICA Study Team  
 Masaharu KINA                                  Member of JICA Study Team  
 Ikuo MORI    Member of JICA Study Team  
 Masami HAYASHI                                Administrative Coordinator of JICA Study Team
2. JICA Advisory Committee for the Study  
 Ken-ichi TANAKA                                Chairman of the JICA Advisory Committee  
 Kohken KOHNOTOH                              Member of the JICA Advisory Committee  
 Tomohiko ISHIKURO                              Member of the JICA Advisory Committee
3. JICA Headquarters  
 Shigeyuki MATSUMOTO                        Second Development Study Division,  
 Social Development Study Department, JICA

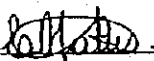
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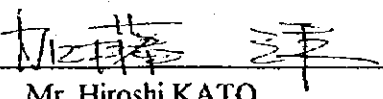
**A.6 Minutes of Meeting for P/R (3), August 29, 1997**

**MINUTES OF MEETING  
ON  
THE PROGRESS REPORT (3)  
OF  
THE STUDY ON THE IMPROVEMENT  
OF  
URBAN SANITATION ENVIRONMENT  
OF  
PRINCIPAL CITIES  
IN  
THE REPUBLIC OF NICARAGUA  
(LEON, CHINANDEGA, AND GRANADA)**

**AGREED UPON BETWEEN  
NICARAGUA INSTITUTE OF MUNICIPALITY FORMATION (INIFOM)  
AND  
JICA STUDY TEAM**

Managua, August 29th, 1997

  
\_\_\_\_\_  
Lic. Cristian Matus  
Executive Director,  
NICARAGUA INSTITUTE OF  
MUNICIPALITY FORMATION (INIFOM)

  
\_\_\_\_\_  
Mr. Hiroshi KATO  
on behalf of  
Leader of JICA Study Team

**MINUTES OF MEETING ON THE PROGRESS REPORT (3) OF THE STUDY ON THE IMPROVEMENT OF URBAN SANITATION ENVIRONMENT OF PRINCIPAL CITIES IN THE REPUBLIC OF NICARAGUA (LEON, CHNANDEGA, AND GRANADA)**

**1. INTRODUCTION**

1.1 The Study Team has submitted the Progress Report (3) (English version of main report and Spanish version of summary 20 copies respectively) to the Government of the Republic of Nicaragua. Consequently a series of meetings were held from August 25th and 26th in Granada and Managua, Nicaragua to discuss the report submitted. A list of officials attending in the above meetings is given in the Appendix 1.

**2. ISSUES AND DECISIONS**

2.1 Various issues were discussed and clarifications on the Progress Report (P/R) (3) were made. Subsequently appropriate consensus was reached during the meetings. These issues, clarifications and consensus are outlined in the following paragraphs.

**2.2 Continuation of Pilot Projects by Nicaraguan side**

The study team requested Nicaraguan side to continue the pilot project even after the pilot projects by the Team finishes. The following are the items that Nicaraguan side shall carry out continuously in relation to the pilot projects.

**Table 1 : Items to be continuously carried out by Nicaraguan side regarding the pilot projects**

Pilot Project	Items to be continuously carried out by Nicaraguan side
1. Beautify Granada Campaign	<ul style="list-style-type: none"> <li>• Based on the result of the experiment, develop more effective ways to enhance residents' awareness and gain their co-operation</li> <li>• Since the waste collection vehicle used in the experiments is still capable of collecting more wastes, the collection service should be expanded to the similar communities (to those served by the experiments). In this connection, campaign activities to enhance residents' awareness and cooperation in waste discharge shall be carried out.</li> </ul>
2. Experiment on Improvement of Refuse Collection System	<ul style="list-style-type: none"> <li>• Provision of regular collection service</li> <li>• Examine possibility of reducing collection frequency from three times to twice a week in order to reduce cost.</li> </ul>
3. Experiment on Improvement of	<ul style="list-style-type: none"> <li>• Expanding publicity and providing public education</li> <li>• Providing regular collection service</li> </ul>

Ⓢ bMP



Arroyo Zacateligue Sanitation Environment	
4. Experiment on Sanitary Landfill Operation at La Joya Disposal Site	<ul style="list-style-type: none"> <li>• Accumulation of waste dumped and soil coverage on it</li> <li>• The operation and maintenance of access roads to the La Joya disposal site</li> </ul>
5. Experiment on Domestic Waste Water Collective Treatment System	<ul style="list-style-type: none"> <li>• Operation and maintenance of the domestic waste water collective treatment facility</li> <li>• Expanding publicity and providing public education</li> </ul>

The Nicaraguan side approved the request.

### 2.3 The Operation of Adelita II Domestic Waste Water Collective Treatment Facility and the Monitoring Results

Team requested that the operation records (up to the end of September 1997) of Adelita II domestic waste water collective treatment facility should be reported to the Team by INAA Region IV by the middle of October 1997. The operation records shall include the following information.

1. The total number of the households connected to the system.
2. Information regarding rain water exclusion measures realized and its outcome.
3. Information regarding education and/or instruction given to residents with regard to the prevention of the inflow of non-decomposable matters in the sewer.
4. Hourly and daily fluctuation of the system influent (Monitoring should be at least for one week).
5. Water quality
  - Sampling place : Intake box, Distribution box, System effluent
  - Monitoring Items : BOD, COD, SS, pH, E.coli, Total coliform, Temperature, Water temperature
  - Frequency : Once a month

The Nicaraguan side approved the request.

### 2.4 Impermeable Liner for the New municipal Disposal Site at San Jose de la Viuda

It was confirmed by both sides that an impermeable liner using clayey material should be designed for the new municipal disposal site at San Jose de la Viuda.

(2) to MP

2.5 **Leachate Treatment of the New Municipal Disposal Site at San Jose de la Viuda**

The Study Team inquired the Nicaraguan side that whether or not the design of leachate treatment can employ the option of : “leachate should be diluted to the permissible concentration level and to be treated at Tepetate sewage treatment plant”.

It was difficult to be clarified and declared by INAA at this moment whether diluted leachate are acceptable or not to the Tepetate plant, in view of limited capacity of the present plant.

Consequently, it was suggested by Nicaraguan side that the two options as below should be considered in the design, on the assumption that INAA may approve discharge of the diluted leachate to the sewer system where the Tepetate plant will have the capacity to accept it with certain conditions of: acceptable quantity/quality; and the level of fee charges to be paid for the treatment.

1. “Leachate should be diluted to the permissible concentration level and to be treated at Tepetate sewage treatment plant” and
2. “An independent leachate treatment system at SJV site”.

Consequently, Team requested that selecting one from two options for the design shall be decided by the Team in 3<sup>rd</sup> Study Work in Japan based on his assumption and at his discretion after the examination of two options, because feasibility study can not be carried out respectively for two options.

The Nicaraguan side agreed it.

2.6 **Correction of P/R (3)**

Discussion among the counterpart and the Team concluded the changes in expression in the “Section 1.2.2 a.3 **Main Proposal for the Organizational Improvement: Item 4**” of the Summary text as follows. (changes are underlined.)

Items	Proposals for the improvement
4. <u>Contract to Private Sectors</u>	It is recommended that the municipality directly manage and will not entrust to the private sectors until its operation and supervising ability will be established. Regarding the type of the <u>contract to private sector</u> , “ <u>partial contract-out</u> ” type shall be adopted in principle and adoption of “ <u>lump sum package</u> ” type shall be avoid as much as possible.

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Team explained that "lump sum package" type has a jeopardy that in the course of time the collection services will be provided only to high income areas (lucrative areas for the private sectors) and consequently low income areas will be abandoned from private sectors' services. It may in the end increase non-served area and the illegal dumping etc.

Nicaraguan side and Team agreed that the issue of "contract to private sectors" shall be further studied by both sides.

**2.7 Revision/addition of P/R (3)**

Discussion among the counterpart and the Team concluded an revision (reasons as stated 2.5 above) and an addition in expression in the "Section 1.2.2 b. The Main Contents of a New Municipal SW Disposal Site Development Projectt" as "Item No. 2 (revision underlined) and No. 5 (addition)" as follows.

Items	Contents of the project
2. Leachate treatment	<p><u>One option from the below two options should be selected for the design of leachate treatment for F/S:</u></p> <ol style="list-style-type: none"> <li>1. <u>"Leachate should be diluted to the permissible concentration level and to be treated at Tepetate sewage treatment plant"</u></li> <li>2. <u>"An independent leachate treatment system at SJV site"</u></li> </ol>
5. Hazardous industrial waste and/or infectious medical waste	The new municipal SW disposal site development project shall not receive "hazardous industrial waste" and/or "infectious medical waste".

**2.8 Technology Transfer Seminar**

The Study Team requested the Nicaraguan side to produce their comments and suggestions on the draft contents of the technology transfer seminar presented in the P/R (3) by the end of September 1997.

The Nicaraguan side agreed it.

**2.9 Comments on the P/R (3)**

The feasibility study of the first priority projects as well as the draft final report (DF/R) of the study will be compiled during the 3<sup>rd</sup> Study Work in Japan, from beginning of September to mid-November, 1997. In order to reach a certain consensus between Nicaraguan side and the Study Team, the Team submitted the P/R (3) which presents key issues for the preparation of the DF/R including a frame of the first priority projects. The Team requested the Nicaraguan side to

*FE* *BMR*

give their comments on the P/R (3) by 16th of September, 1997 to the Team, especially regarding the frame of the first priority projects.

The Nicaraguan side agreed the request.

#### 2.10 Vehicles and equipment provided by JICA for the Team

INIFOM, the counterpart institution responsible for the Study, expressed their request that: if the vehicles and equipment provided by JICA for the Study Team could be donated to the Nicaraguan side after the Study, which should like to be provided as follows:

- a 3 ton dump truck: Granada municipality,
- a 4WD vehicle Leon municipality,
- a 4WD vehicle Chinandega municipality,
- two copy machines INIFOM
- two fax machines INIFOM

INIFOM detailed the reasons as follows:

- In view of continuation of the pilot project of "Improvement of Refuse Collection System", a 3 ton dump truck is necessary for Granada municipality.
- As stated in the Minutes of the Meeting for Interim Report I, Leon and Chinandega municipalities expressed their strong intention of formulating M/P and executing F/S regarding solid waste management by themselves, in addition to that INIFOM has requested IDB to apply Japan Special Fund for the studies of Leon and Chinandega. Therefore, in order to encourage the 2 cities for further studies and to support the studies, a 4WD vehicle should like to be offered to Leon and Chinandega respectively.
- Two copy machines and two fax machines are to be used by INIFOM in order to execute its mandate i.e., support for the all municipalities.

Team appreciates thoughtful coordination of INIFOM not only for the selected city Granada but also for other 2 cities. Team replied to convey the request to JICA Tokyo.

#### 2.11 Schedule of Meeting for Discussion of Draft Final Report (DF/R)

In view of that the Technology Transfer Seminar is scheduled on 19<sup>th</sup> and 20<sup>th</sup> November 1997, Team requested the Technical Committee meetings and Steering Committee meetings as follows:

② to MP

- Technical Committee meetings on: 13 November 1997  
14 November 1997 (provisional)
- Steering Committee meetings on: 17 November 1997  
18 November 1997 (provisional)

The Nicaraguan side agreed the request.

### 3. CONCLUSION

- 3.1 With the above clarifications and modification, the P/R (3) was approved by the Nicaraguan side.

*EMR*

*(e)*

## List of the Meeting Attendants

## Nicaraguan side

- |    |                          |                                    |                 |
|----|--------------------------|------------------------------------|-----------------|
| 1. | INIFOM                   |                                    |                 |
|    | Lic. Cristian Matus      | Executive Director                 | INIFOM          |
|    | Arq. Marvin Palacios     | Director, Urban Dev. & Muni. Serv. | INIFOM, Managua |
|    | Lic. Orlando Rodriguez   | Analist                            | INIFOM, Managua |
|    | Ing. Asunción Ortega     | Urban Dev. & Municipal Service     | INIFOM, Managua |
|    | Ing. Guillermo Guevara   | Coordinator for the Study          | INIFOM, Managua |
| 2. | INAA                     |                                    |                 |
|    | Ing. Guillermo Correa C. | Technical Manager, Region IV       | INAA, Region IV |
| 3. | INETER                   |                                    |                 |
|    | Ing. Adolfo Tórriz R.    | Sub-director                       | INETER          |
| 4. | MARENA                   |                                    |                 |
|    | Ing. Leonel Wheelock     | General Director of Environment    | MARENA          |
|    | Lic. Helio Zamora        | Director Toxicity Control          | MARENA          |
| 5. | MINSA                    |                                    |                 |
|    | Dr. Claudia Cajina Mora  | Hygiene & Epidemic Direction       | MINSA, Managua  |
|    | Ing. Maritza Obando      | Communal Hygiene                   | MINSA, Managua  |
| 6. | Leon City                |                                    |                 |
|    | Arq. Gustavo García      | Director, City Planning            |                 |
| 7. | Chinandega City          |                                    |                 |
|    | Lic. Rodolfo Grios H.    | Mayor                              |                 |
|    | Lic. Raúl Valladares O.  | Adviser                            |                 |
|    | Lic. Azarías Chavez      | Director, External Cooperation     |                 |

8. Granada City  
Lic. Tatiana Raskoski Mayor  
Lic. Marisa de Pasos Director, External Relation  
Ing. Gerardo Espinoza Director, Operation
9. Ministry of External Cooperation  
Lic. Minoru Arimoto Expert  
Lic. Lucía Medina S. Advisor for Japan projects

Japanese Side

1. JICA Study Team  
Hiroshi KATO Member of JICA Study Team  
Tadaya YAMAMOTO Member of JICA Study Team  
Mario Valle Assistant

(E)

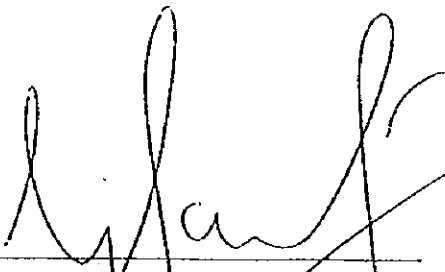
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A.7 Minutes of Meeting for DF/R, November 20, 1997

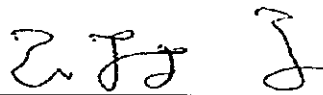
MINUTES OF MEETING  
ON  
THE DRAFT FINAL REPORT  
OF  
THE STUDY ON THE IMPROVEMENT  
OF  
URBAN SANITATION ENVIRONMENT  
OF  
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AGREED UPON BETWEEN  
NICARAGUA INSTITUTE OF MUNICIPALITY FORMATION (INIFOM)  
AND  
JICA STUDY TEAM

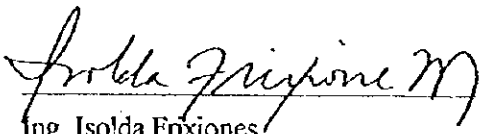
Managua, November 20th, 1997



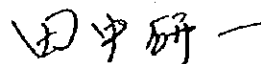
Dr. José Rizo Castellón  
Minister President  
NICARAGUA INSTITUTE OF  
MUNICIPALITY FORMATION (INIFOM)



Mr. Susumu SHIMURA  
Leader of JICA Study Team



Ing. Isolda Fraxiones  
Director General (a.i.) Bilateral Management  
Ministry of External Cooperation (MCE)



Mr. Ken-ichi TANAKA  
Chairman of JICA Advisory  
Committee



**MINUTES OF MEETING ON THE DRAFT FINAL REPORT OF THE STUDY ON  
THE IMPROVEMENT OF URBAN SANITATION ENVIRONMENT OF  
PRINCIPAL CITIES IN THE REPUBLIC OF NICARAGUA  
(LEON, CHINANDEGA, AND GRANADA)**

**1. INTRODUCTION**

1.1 The Study Team submitted the following number of copies of the Draft Final Report to the Government of the Republic of Nicaragua:

- Executive Summary (English Version): 20 copies
- Executive Summary (Spanish Version): 20 copies
- Main Report for the M/P and Conceptual M/Ps (English Version): 20 copies
- Main Report for the M/P and Conceptual M/Ps (Spanish Version): 20 copies
- Main Report for the Feasibility Study (English Version): 20 copies
- Main Report for the Feasibility Study (Spanish Version): 20 copies
- Annex: 10 copies
- Data Book: 10 copies

Consequently a series of meetings were held on November 13th and 18th in Managua, Nicaragua to discuss the report submitted. A list of officials attending in the above meetings is given in the Appendix 1.

**2. ISSUES AND DECISIONS**

2.1 Various issues were discussed and clarifications on the Draft Final Report (DF/R) were made. Subsequently appropriate consensus was reached during the meetings. These issues, clarifications and consensus are outlined in the following paragraphs.

## 2.2 Approval of MINSA on the SJV New Landfill Candidate Site

The MINSA representative for the Technical Committee stated the Study Team that an approval of MINSA should be obtained for the selection of the SJV (San Jose de la Viuda) new landfill candidate site.

The Study Team replied that the site selection work in the Study has been conducted as described below and each work procedures and results were presented in the Study Reports and discussed/agreed by the minutes of the meetings (M/M) on the respective report; so that the Team understands the Nicaraguan side including MINSA approved the selection of the SJV new landfill candidate site.

1. Two candidate sites were presented by Granada Municipality.
2. The Team reviewed available data and information regarding these candidate sites, conducted field reconnaissance, and assessed the candidate sites. Based on the evaluation, the Team proposed that the SJV site be subject to the F/S. The procedures and results were presented in the Progress Report (2).
3. After examining the Team's proposal for the site selection, Granada Municipality decided to select the SJV as the new municipal SW final disposal site.

The Nicaraguan side acknowledged the site selection work applied in the Study.

## 2.3 Level of Sanitary Landfill for SJV a New Municipal SW Disposal Site

The Study Team informed that although the plan for SJV a new municipal SW disposal site was prepared as Level 4 of sanitary landfill based on the discussions with MARENA, INIFOM and Granada Municipality, the Team worries about the financial burden sharing for its construction, operation and maintenance. In case of Level 4 the unit disposal cost is estimated at 215.6 CS/ton which is 2.4 times more expensive than that in the case of the Level 2 (88.5 CS/ton). If Granada Municipality applies the unit disposal cost as the tipping fee of the new landfill, it may cause a huge amount of illegally dumped wastes in the city. If not, the Municipality subsidizes the tipping fee, it results a financial deficit. Therefore, the Team requested the Nicaraguan side to carefully examine an appropriate level of sanitary landfill for SJV a new municipal SW disposal site. If the Nicaraguan side

concludes Level 2 is appropriate by the 19th of December, 1997 and inform their decision to the Team by the time, the Team shall review and modify the DF/R and prepare the F/R based on the Level 2 including EIA report.

The Nicaraguan side asked the Team what is the difference of the environmental impact by Level 4 and by Level 2.

The Team replied that Level 2 curtails disposal cost but creates local underground water contamination by leachate and the negative impact can be mitigated by supplying potable water (of INAA) to the surrounding populations and prohibiting them the use of the underground water for drinking.

The Nicaraguan side replied that they will examine/decide the appropriate level of the sanitary landfill, and inform their decision to the Team by December 19th, 1997.

#### 2.4 EIA Report

The Nicaraguan side informed the Study Team that a Sanitary Permit of MINSA shall be obtained for the implementation of the SJV A New Municipal SW Disposal Site Development Project.

The Study Team clarified to the Nicaraguan side that since the proponent of the project is the Granada Municipality, not the Team, the municipality shall submit the EIA report and get an environmental permit as well as a sanitary permit (if necessary) for the implementation of the project.

The Nicaraguan side replied that they understood the clarification and the municipality will take prompt action.

#### 2.5 Establishment of a Proper Institutional System

As stressed in the report the establishment of a proper institutional system is the most important task to realize the USE (Urban Sanitation Environment) Master Plan and to make the proposed technical system sustainable. The Study Team, therefore, recommended the Nicaraguan side to promptly commence the improvement of 8 institutional issues listed below for the implementation of the first priority projects which is the first step of the Master Plan.

For F/S-1: Municipal Solid Waste Management System Improvement Project, i.e. Granada Municipality:

1. Establishment of Urban Environmental Maintenance Bureau (UEMB)
2. Enactment of regulation on SWM
3. Joint billing of refuse collection fees with water supply charges
4. Promote education programs for the residents
5. An annual increase rate of 5.4 % on municipal tax revenues

For F/S-2: Model Community USE Integrated Improvement Project:

1. Establish a steering committee for PECM ("Special Program for Model Community Integrated USE Improvement Project") made up of representatives from INAA, Granada Municipality, and MINSA/SILAIS.
2. Formation of task force in INAA, Granada Municipality and MINSA/SILAIS respectively in order to promote "Model Community USE Integrated Improvement Project".
3. Promote education programs for the residents

The Nicaraguan side replied that they will take a prompt action.

## 2.6 Comments on the DF/R

The Study Team requested the Nicaraguan side that all comments by the Nicaraguan side to the DF/R should be submitted to the JICA office in Managua by December 19th, 1997 if they are to be considered by the Team for the preparation of the Final Report.

The Nicaraguan side approved the request.

## 2.7 Continuation of the Pilot Projects

The mayor of the Granada Municipality informed the Study Team that the municipality expands the refuse collection services to the some of the urban fringe areas based on the pilot project conducted by the Team.

The Team expressed the great appreciation for the efforts made by the Nicaraguan side.

2.8 **Publication of the Final Report**

Both side agreed that the final report should be made accessible to the public.

3. **CONCLUSION**

3.1 With the above clarifications and modification, the DF/R was approved by the Nicaraguan side.



## List of the Meeting Attendants

## Nicaraguan side

- |    |                            |                                    |                  |
|----|----------------------------|------------------------------------|------------------|
| 1. | INIFOM                     |                                    |                  |
|    | Dr. José Rizo Castellón    | Minister                           | INIFOM           |
|    | Lic. Cristian Matus        | Executive Director                 | INIFOM           |
|    | Arq. Marvin Palacios       | Director, Urban Dev. & Muni. Serv. | INIFOM, Managua  |
|    | Ing. Asunción Ortega       | Urban Dev. & Muni. Serv.           | INIFOM, Managua  |
|    | Ing. Guillermo Guevara     | Coordinator for the Study          | INIFOM, Managua  |
| 2. | INAA                       |                                    |                  |
|    | Ing. Edwin L. Sandoval     | Technical Director                 | INAA, Region IV  |
|    | Ing. Walter Barberena G    | Manager, Technical Standard        | INAA, Managua    |
|    | Ing. Sergio Tercero T      | Manager                            | INAA, Managua    |
| 3. | INETER                     |                                    |                  |
|    | Lic. Alfoso Orega          | Director, Project Planning         | INETER           |
| 4. | MARENA                     |                                    |                  |
|    | Ing. Leonel Wheelock       | General Director of Environment    | MARENA           |
|    | Lic. Ma. Amparo Vallejos   | Responsible for Environment        | MARENA           |
| 5. | MINSA                      |                                    |                  |
|    | Dr. Federico Prado         | Vice-Minister                      | MINSA            |
|    | Dr. Humberto Castillo      | Assistant of vice-Minister         | MINSA            |
|    | Ing. Rosa J. Martinez      | Project Engineer                   | MINSA, Managua   |
|    | Doc. Sala Moraga S.        | Responsible for Epidemic           | MINSA, Region IV |
| 6. | Leon City                  |                                    |                  |
|    | Lic. Augustin Moreira Dona | Vice-Mayor                         |                  |
|    | Dr. Ofilio Mayorga         | Director, Municipal Services       |                  |
| 7. | Chinandega City            |                                    |                  |
|    | Ing. Rodolfo Jose Grios    | Mayor                              |                  |
|    | Lic. Azariáz Chavez        | Director, External Cooperation     |                  |

8. Granada City  
 Lic. Tatiana Raskoski Mayor  
 Lic. Marisa de Pasos Director, External Relation  
 Ing. Gerardo Espinoza Director, Operation
9. Ministry of External Cooperation  
 Lic. Minoru Arimoto Expert  
 Lic. Alejandro Malte'z Advisor for Japan projects  
 Lic. Lucia Medina Advisor for Japan projects

#### Japanese Side

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 Hiroshi KATO Member of JICA Study Team  
 Tadayama YAMAMOTO Member of JICA Study Team  
 Jose Felicio HADDAD Member of JICA Study Team  
 Kozo BABA Member of JICA Study Team  
 Masami HAYASHI Administrative Coordinator of JICA Study Team
2. JICA Advisory Committee for the Study  
 Ken'ichi TANAKA Chairman of the JICA Advisory Committee  
 Kohken KOHNOTOH Member of the JICA Advisory Committee  
 Tomohiko ISHIKURO Member of the JICA Advisory Committee
3. JICA Headquarters  
 Setsu MIYAWAKI First Overseas Assignment Div.,  
 Secretariat of Japan Overseas Cooperation Volunteers,  
 JICA