

**JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
GOVERNMENT OF GUJARAT**

**THE RECONSTRUCTION SUPPORT
FOR THE GUJARAT-EARTHQUAKE DISASTER
IN THE DEVASTATED AREAS IN INDIA**

SUMMARY

OCTOBER, 2002

**YAMASHITA SEKKEI INC.
NIHON SEKKEI, INC.**

Preface

In response to a request from the Government of India, the Government of Japan decided to implement a project on the Reconstruction Support for the Gujarat-Earthquake Disaster in the Devastated Areas in India and entrusted the project to the Japan International Cooperation Agency (JICA).


JICA selected and dispatched a project team headed by Mr. Toshio Ito of Yamashita Sekkei Inc., the representing company of a consortium consists of Yamashita Sekkei Inc. and Nihon Sekkei, Inc., from June 6th, 2001 to May 29th, 2002 and from August 4th to August 18th, 2002. In addition, JICA selected an advisor, Mr. Osamu Yamada of the Institute of International Cooperation who examined the project from specialist and technical points of view.

The team held discussions with the officials concerned of the Government of India and the Government of Gujarat and conducted a field survey and implemented quick reconstruction support project for the primary educational and healthcare sectors. After the commencement of the quick reconstruction support project the team conducted further studies and prepared this final report.

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

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of India and the Government of Gujarat for their close cooperation extended to the project.

October 31st, 2002



Takao Kawakami

President

Japan International Cooperation Agency

LETTER OF TRANSMITTAL

October, 2002

Mr. Takao KAWAKAMI
President
Japan International Cooperation Agency

Dear Mr. Kawakami,

It is great pleasure to submit herewith the Final Report of the Study on the Reconstruction Support for the Gujarat-Earthquake Disaster in the Devastated Areas in India.

The study team of the Yamashita Sekkei Inc. and Nihon Sekkei, Inc. conducted surveys in India over the period between June 2001 and October 2002 as per the contract with Japan International Cooperation Agency. This report consists of summary, main and appendices volumes

As a part of the project a quick reconstruction support project, which consists of reconstruction of 5 primary schools with a total of 35 classrooms and 2 CHCs with a total of 64 beds, was carried out in Kutch district of Gujarat state.

We wish to express our sincere appreciation to the officials concerned of the Government of India, the Government of Gujarat, the Ministry of Foreign Affairs of Japan, the Embassy of Japan in India, JICA Headquarters and JICA India office for their close cooperation extended to the project.

Finally, we hope that this report will contribute to further rehabilitation of the devastated areas.

Very truly yours,

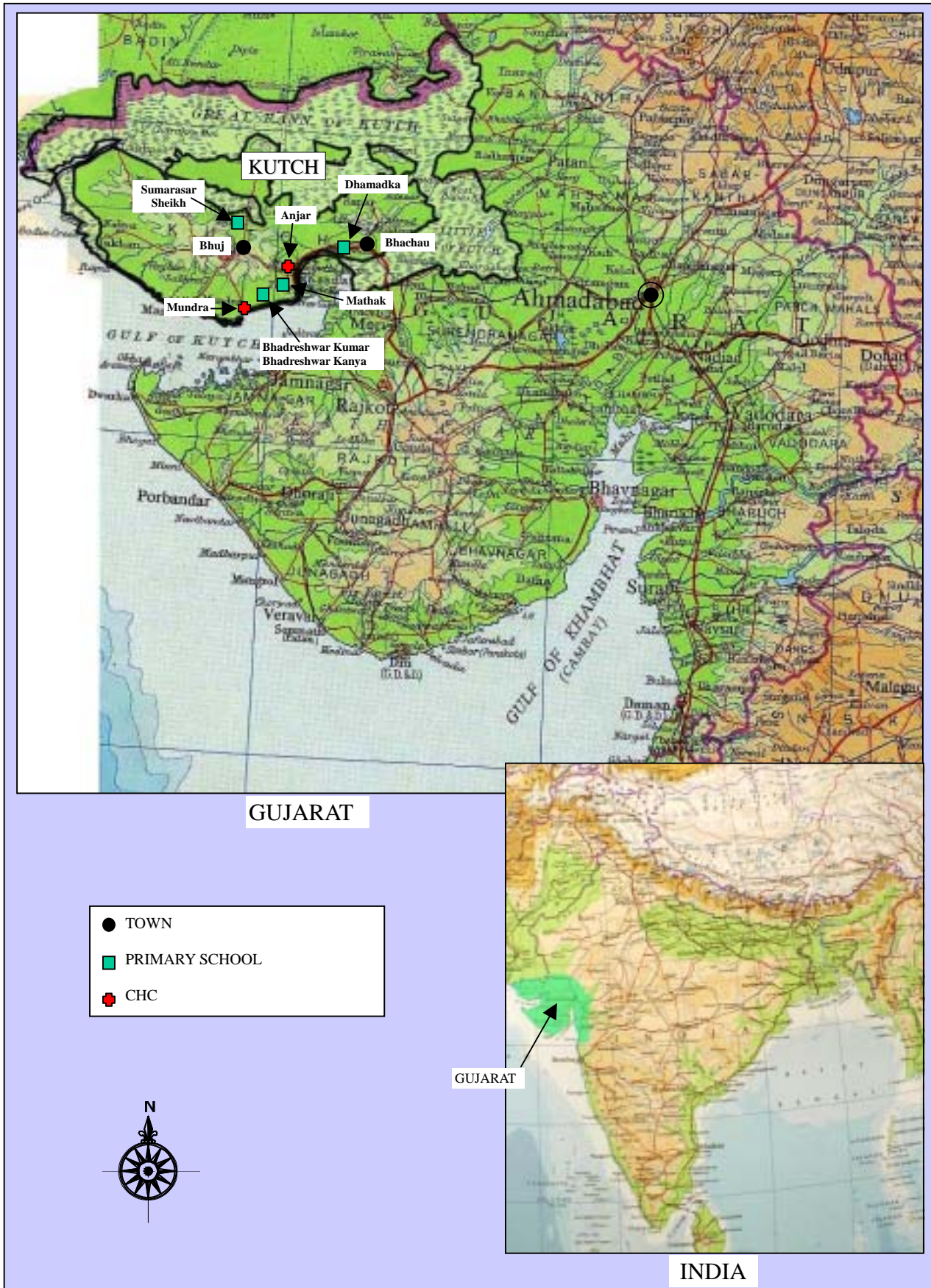


Toshio ITO

Team Leader,

The Study Team for the Reconstruction Support
for the Gujarat-Earthquake Disaster
in the Devastated Areas in India

THE RECONSTRUCTION SUPPORT FOR THE GUJARAT-EARTHQUAKE DISASTER
IN THE DEVASTATED AREAS IN INDIA

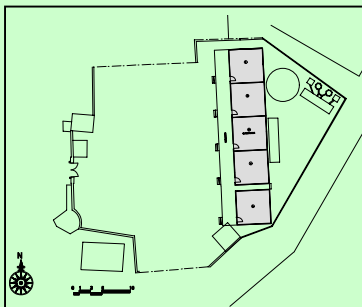


LOCATION MAP

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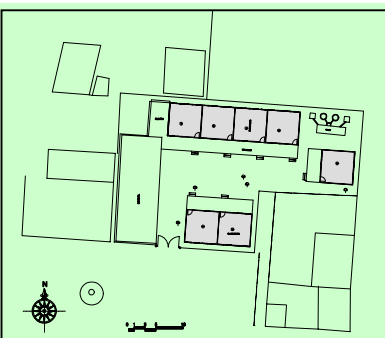


SUMARASAR SHEIKH PRIMARY SCHOOL

BEFORE



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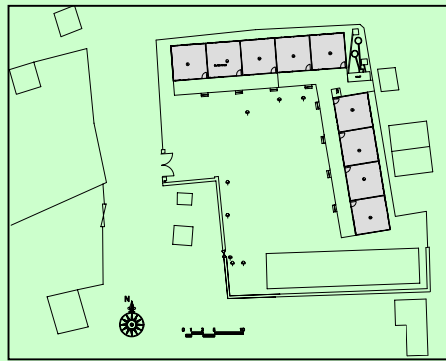
DHAMADKA PRIMARY SCHOOL

PHOTO & SITE PLAN

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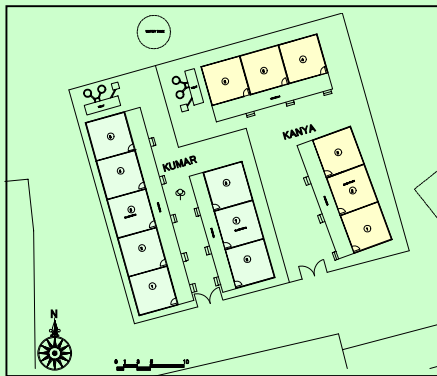
MATHAK PRIMARY SCHOOL

BEFORE



AFTER

KUMAR



KANYA



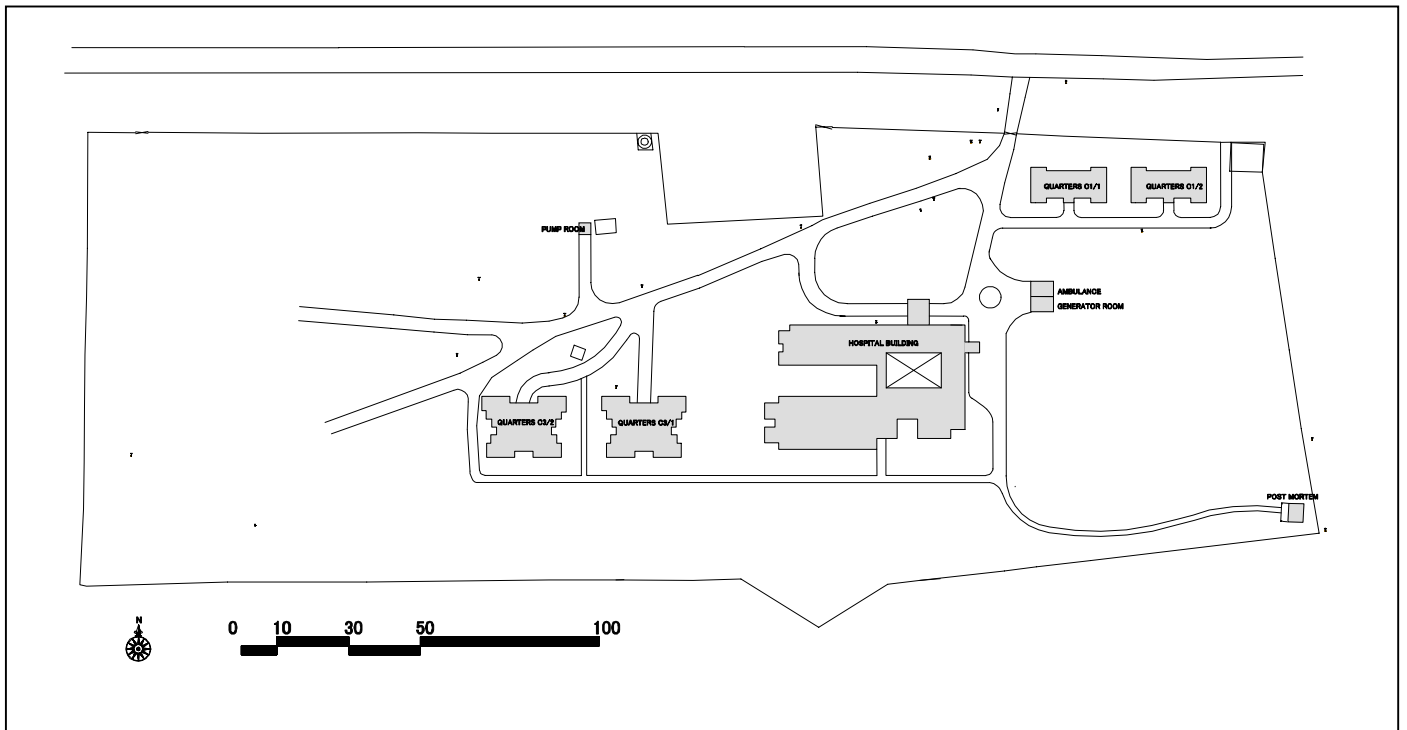
BHADRESHWAR PRIMARY SCHOOLS (KUMAR & KANYA)

PHOTO & SITE PLAN

BEFORE



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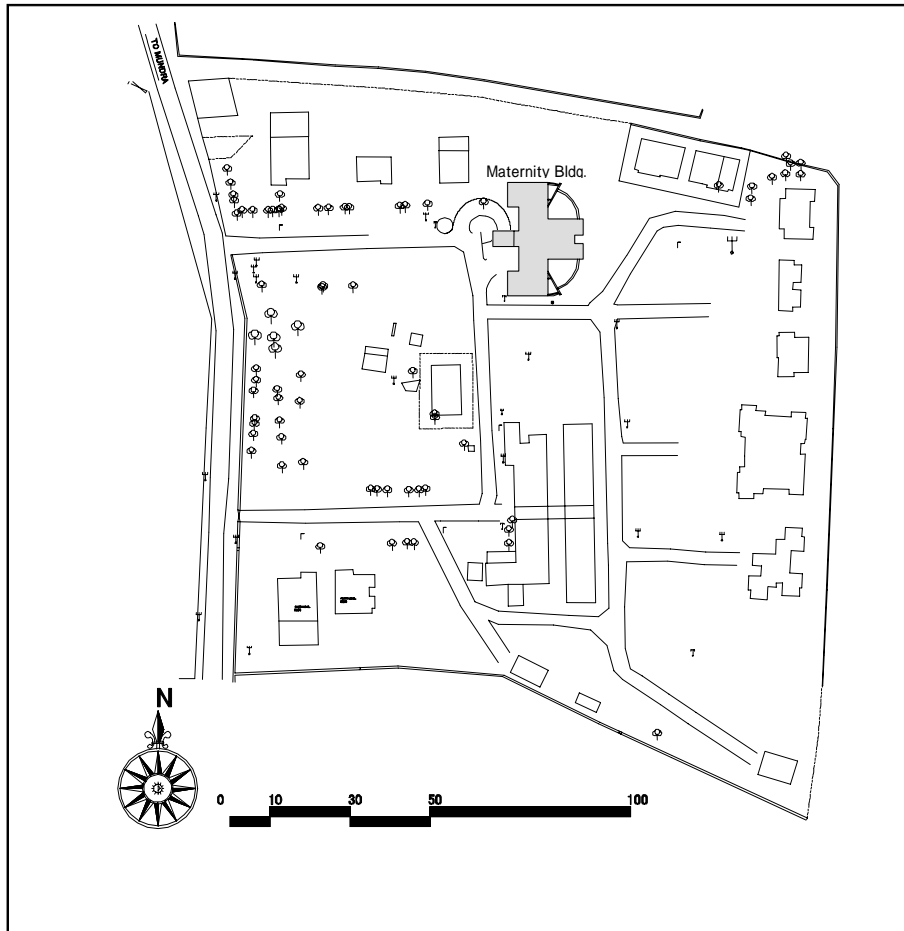
ANJAR CHC

PHOTO & SITE PLAN

BEFORE



AFTER



MUNDRA CHC

PHOTO & SITE PLAN

Summary

This Project began on June 6th, 2001 and the Final Report of the Project is to be submitted after being revised according to the Minutes of Meeting of the meetings held for explanation of and discussion on the Draft Final Report.

The Project will complete at the end of March 2003 by submitting an inspection report on the facilities built as the quick reconstruction support project (QRS project) of this Project, under which two Community Health Centres and five primary schools were constructed and handed over to the Government of Gujarat (GOG) on April 9th, 2002 and May 24th, 2002 respectively.

The Project covers investigating and grasping entire rehabilitation and reconstruction activities of the GOG, collaboration of private sectors and the GOG, and various agencies, e.g. international organizations, other countries, NGOs, etc. The Project further covers finding out items for potential future cooperation within the rehabilitation and reconstruction activities of the GOG and examining the needs and acceptability of the items as the Rebuilding Plan in the Final Report.

As a result of discussions held between the officers of the GOG and the JICA Project Team based on the Draft Final Report and the situation after more than one year from the occurrence of the earthquake, two items for the Primary Educational Sector, four items for the Technical Educational Sector, a package project consists of five items for the Healthcare Sector, and community training were identified as the items for the Rebuilding Plan. All of the identified items are deemed to be urgently necessary and appropriate for further support.

1. Background

(1) Outline of the Earthquake

On January 26th, 2001, a large-scale earthquake of magnitude 6.9 occurred, with an epicentre situated 10km north of Bhachau town in Kutch district, which is in the western part of Gujarat state, India. According to an analysis carried out by the Earthquake Research Institute of Tokyo University, the earthquake pattern is reverse fault type of the south-north axis compression within the Indian Plate.

13,805 people died in the earthquake, 1,003,000 houses were destroyed and an overall damage of 3.3 Billion dollar occurred according to a Gujarat State Disaster Management Authority (GSDMA) Report of February 2001. According to the World Bank (WB) and Asian Development Bank (ADB), the rebuilding cost is estimated as 2.27 billion dollar.

According to a record, there was a similar scale earthquake around Bhuj and Anjar region in 1819 with the death toll of approximately 2,000. Kutch district was sparsely populated dry grazing

land and urbanisation had not yet been progressed in Bhuj and Anjar in those days, so that the devastation and death toll was not so big. Since then, there have been eight earthquakes with magnitude over 6.0 in Gujarat until 2001. The huge devastation and death toll of this time were caused by the scale of the earthquake and the progress of urbanisation in the cities around the epicentre as well as a large number of fragile buildings which collapsed due to substandard structural quality against earthquakes. Further, many school children and teachers became victims of the earthquake because the day was the Republic Day and the earthquake took place just at the time of the ceremony opening.

(2) Laws, Regulations, Situation of Their Enforcement

India has detailed building laws and regulations, which require architectural plans to be subject to screening of their contents by the local authority. It is essential to comply with the local building laws and regulations, however, the situation of collapsed buildings indicates that the screening procedure was not enforced thoroughly prior to the earthquake.

According to a report of GSDMA, buildings constructed according to the standards specified for the zone, with proper quality control in materials used and appropriate techniques had performed much better than those built with substandard materials, inadequate bonding, insufficient curing, etc. The laws and regulations should ideally be followed by all, however, recognizing the difficulty to strictly enforce the rules due to local situations such as economic level, general education level of residents, engineering knowledge of construction labourers, available tools and materials at hand, etc., it could be said that actual enforcement of the rules was not easy.

2. Situation of the Disaster

(1) Primary Educational Sector

Many of the primary educational facilities were destroyed by the earthquake. According to the latest data, there were 1,234 damaged schools, 7,424 damaged classrooms in Kutch. The GOG was in charge of 104 schools and 707 classrooms. The primary educational facilities are taken as one of the most basic items of social infrastructure and of the most urgent items requiring restoration after housing. There was much monetary assistance from the WB and ADB, and much building assistance from international organizations and NGOs such as UNICEF, Rotary Clubs and Kalutakana & Russia, FICCI-CARE, Save the Children.

(2) Healthcare Sector

According to the latest data, 4 general hospitals were completely destroyed and assistance agencies for rehabilitation of each hospital had already been appointed. Among the 4 general hospitals, Bhuj general hospital, being funded by the Prime Minister Relief Fund, is currently under construction. Damaged 7 Community Health Centres (CHCs) and 11 Primary Health

Centres (PHCs) were all designated to NGOs and other agencies for reconstruction assistance. Of existing 251 Sub-centres, 95 were destroyed and 119 were damaged, a total of 214 centres being affected. Assistance agencies for 181 of these centres have been assigned, and the remaining 33 still require further assistance. Of other healthcare facilities, damages to Anganwadis (day-nursery centres) were also severe. In principle, reconstruction of these Anganwadis and sub-centres in all over the district are under the scope of UNICEF, the Indian Red Cross and other large scale assistance organizations. Medium-size organizations such as Save the Children are looking after reconstruction of healthcare facilities such as sub-centres within some of the regions.

3. Measures taken by the GOG/GOI and International Society

(1) Measures taken by the GOG/GOI

Soon after the occurrence of the disaster, the GOI took immediate measures for restoration; setting up the Prime Minister Relief Fund to accept the international assistance, designating the GOG as the executing institution for rehabilitation.

In order to cope with the devastated situation, the GOG established GSDMA, which consists of central government executives, state government executives, and authorities from academic field, to be central core for disaster management of the state, for speedy implementation of the rehabilitation and reconstruction program, and for future disaster management capacity building in the state. Since then, GSDMA has drawn up various rehabilitation programs and has co-ordinated and promoted multilateral international assistance.

The GOG started its action quickly to implement Package-1 for public private partnership programs, Package-2 for rehabilitation measures for severely affected areas, Package-3 for rehabilitation measures for other areas, Package-4 for earthquake-resist structure reconstruction scheme in urban areas, and Package-5 for major city urban planning program.

Realizing the difficulties in enforcing the laws, regulations, and proper construction method in rural areas, GSDMA prepared guidelines in order to propagate practical technique for making more durable structures against earthquakes and cyclones by using locally available materials and tools at hand. The guidelines were made in order to educate and help those involved in the reconstruction and rehabilitation programs, and to all those involved in the construction activities.

(2) Measures taken by International Society

International society responded immediately after the earthquake recognising needs of humanitarian support to the large scale of devastation and importance of the social development of the areas. WB and ADB had been engaged in social infrastructure development for years before the earthquake and they released Gujarat Earthquake Recovery Program on March 14th,

2001, which provides reliable detailed information as well as an outline for recovery activities. UNICEF had been striving to implement its children welfare and basic healthcare program, 'Right of the Child', before the earthquake and after the earthquake it started a new program, 'Creation Child Friendly Spaces', to provide large number of water tanks, toilet units for primary schools, Anganwadis, and classrooms for primary schools. Also Netherlands had been engaged in development of primary educational facilities in the state and decided to assist reconstruction program of primary schools soon after the earthquake. International NGOs together with Indian NGOs had been earnestly engaged in the social development programs for children, women, and scheduled casts/tribes before the earthquake and began their rehabilitation programs utilizing their previous experiences after the earthquake.

4. Measures taken by the Government of Japan (GOJ)

(1) Diplomatic Significance

Indian people have historically had a sense of friendship with the Japanese. Treaty of Peace Between Japan and India was concluded in 1952. Cultural Agreement Between Japan and India was signed in 1956. Agreement on Commerce Between Japan and India was signed in 1958. And recently, in the Indo-Japan Symposium of February 10th 1997 titled 'Vision 2000 and Beyond', it was stated that for the continued regional prosperity in Asia, further good relations between the two major democratic countries in the region, in terms of reciprocal social development, exchange of technology and mutual positive co-operation, will be very significant. Japan, having recently experienced the damage from the Hanshin Awaji (Kobe) Earthquake, and being subject to frequent earthquake damage, the Japanese fully understand Indian people's shock caused by the earthquake. In line with the friendship of the two countries and the sympathy and compassion to the people in the affected areas, the GOJ took the necessary measures as quickly as possible.

On January 30th, a Japan Disaster Relief Team consisting of doctors and nurses was dispatched along with relief supplies, and on the 6th February, a large amount of additional relief supplies was supplied by utilizing manpower and transport planes of Japanese Self-Defence Forces.

On February 26th, the Ministry of Foreign Affairs of Japan commissioned JICA to dispatch a mission for a Background Survey for Earthquake Disaster Rehabilitation, so that they could study damage status and confirm assistance needs.

On April 8th, a Preparatory Team for Reconstruction Support for the Gujarat Earthquake Disaster in the Devastated Areas in India was dispatched by JICA, to work through investigative cooperation on assistance fields, methods and scales, and the results of these were recorded on April 26th 2001 through signing the Scope of Works (S/W) and the Minutes of Meeting (M/M).

(2) Humanitarian Significance

Kutch district, the main devastated area, has severe natural and climatic conditions and its own special historical and cultural conditions, there exist everlasting scarcity and tribal issues. The devastating natural disaster might become the cause of worsening the children welfare, women well-being, and so on. Thus, humanitarian assistance to the area in terms of social infrastructure redevelopment was an urgent need and would be quite significant. That was the reason for Japan's intention to support reconstruction of primary educational and basic healthcare facilities in the devastated areas soon after the disaster. Dispatch of the Disaster Relief Team, provision of relief supplies and manpower by Japanese Self-Defence Forces, and many other urgent actions were taken in line with this effort. Japan's NGOs, such as Japanese Red Cross, Adventist Development & Relief Agency of Japan, Association of Medical Doctors in Asia, Japanese Association in India and many others extended financial and manpower relief support to the people in Gujarat also based on the humanitarian point of view.

(3) Sectors for Assistance and Implementation Scheme

Assistance for educational and healthcare sectors is in line with the principle of Japan's Official Development Assistance (ODA), which emphasizes assistance for human development.

In view of urgency for reconstruction, JICA utilised a QRS under the Social Development Study scheme with which construction of required facilities and procurement of equipment could be implemented quicker than a Grant Aid Program scheme, which usually takes several years for construction/equipment work, and thus it is the most responsive and suitable measures to tackle the situation.

After series of discussions between the GOG and the Preparatory Team sent by JICA, educational and healthcare facilities were identified to be suitable for the QRS project and recorded in the S/W on April 26th, 2001 which shaped the scheme and scale of the Project.

5. Outline of the Project

(1) Objectives

This Project targets on educational and healthcare sectors, basic fields of regional social welfare. Assistance for these sectors was urgently needed by the suffering local societies and in line with the principle of Japan's ODA.

New temporary facilities, such as tents and huts, provided by UNICEF and other organizations were urgently needed, however, they were to be replaced with new permanent facilities as soon as possible in order to provide secure and stable environment to the local community.

The Project was first to grasp the situation of the pre-earthquake status and of the devastation.

After investigating the situation, it was decided to reconstruct classrooms for five primary schools and two CHCs as a part of the Project. And, at the same time, it was to draw up a Rebuilding Plan for potential future supports by consulting the GOG regarding the Rebuilding Plan's appropriateness and necessity.

(2) Quick Reconstruction Support Project

Based on the preparatory study, the discussions on the inception report and the site survey, appropriateness and necessity were confirmed and five schools and two healthcare facilities were selected for QRS project. The tender documents for building work and equipment work were prepared in Ahmedabad and two contractors and a supplier were selected locally through tender procedure.

The contents of the QRS project are as follows.

1) Primary Educational Facilities

The structural system used to construct primary educational facilities is a precast concrete panel prefab system designed for earthquake zone-5 under which Kutch district falls. The structure is durable against the harsh environment of Kutch and provides safe shelter, which is suitable for primary educational facility. The new facilities could be used as refuges since most of them are located near the centre of the villages. They can also be used as public space for meetings and other functions of the village.

The outline of the primary educational facilities is shown below.

	Name	District	No. of Classrooms
1	Sumarasar Sheikh	Bhuj	5
2	Bhadreshwar Kumar	Mundra	8
3	Bhadreshwar Kanya	Mundra	6
4	Mathak	Anjar	9
5	Dhamadka	Anjar	7

* Each classroom is equipped with two ceiling fans, four florescent lights and has one each of teacher's desk & chair, a blackboard, a notice board, and a cupboard.

2) Healthcare Facilities

The structure of two CHCs is RCC rigid frame structure suitably designed for earthquake zone-5 in order to provide reliable/stable medical services to the people within the respective catchment areas of both CHCs. Major medical equipment was also supplied to Anjar CHC

because most of the existing medical equipment was destroyed by the earthquake.

The outline of the healthcare facilities is given below.

	Name	Area
1	Anjar CHC Hospital Building (OPD, Diagnostic Dept., OT, Emergency room, 50 bed Ward) C1&2 Staff Quarters (2 bldgs. for 6 units) C3 Staff Quarters (2 bldgs. for 10 units) Others (Post-mortem room, Garage/DG set room, Pump room) Medical Equipment (X-ray, OT table, Shadowless Lamp, Beds, etc.)	2,735m ²
2	Mundra CHC Maternity Building	300m ²

(3) Rebuilding Plan

There are two methods for restoration of seismic damage. One is restoration to the original state and the other is reconstruction. And there are two ways of support. One is support for the whole village and the other is for specific facilities. In carrying out the Project, significance and appropriateness of the Rebuilding Plan were studied from the point of views of restoration and reconstruction on the basis of GOG's Rehabilitation & Reconstruction Program. The result of discussions with the GOG officers regarding the Rebuilding Plan at the time of explanation of the Draft Final Report was recorded in the Minutes of Meeting (M/M) dated August 14th, 2002. The M/M reflects earnest desire from the respective sectors at present.

In carrying out the studies of the Rebuilding Plan, the particular characteristics of the region in terms of existing resources, appropriate technology, human resources and limits on the availability etc. were all taken full account of. Because the locations of facilities indicated in the Rebuilding Plan are nearby where the QRS project was carried out in Kutch district, where damages by the earthquake were most severe.

1) Rebuilding Plan for the Educational Facilities

a) Rebuilding Plan for the Primary Educational Facilities

Need for more classrooms, was clarified and stressed strongly. Because a recent survey carried out to find out the number of school age children in Kutch revealed that the previous number of required classrooms was no longer relevant since the number of school age children was greater than the previous record.

The GOG and NGOs started supplying IT equipment and/or other educational equipment to not all but to some of the primary schools in the state due to inadequacy in quantity.

The GOG expressed the need for supply of the same items in order to distribute to the schools other than the ones that have already been supplied. This would contribute to improvement of the level of education.

The following are the requested items.

Supply of Equipment/Materials

- I.T. equipment (computer): 5 Nos. per school,
- Equipment for physical education,
- Drinking water facilities,
- A teachers' room cum library, teaching material store, etc.
- Low height desks for children (sufficient height for sitting position on the floor)

Construction of more classrooms

b) Rebuilding Plan for the Technical Educational Facilities

While domestic and overseas assistance poured into the primary educational and healthcare sectors, the GOG considered that important elements of regional social assistance should consider industrial social infrastructure and technical educational institutions. The Engineering College, Bhuj suffered total seismic damage. Some temporary prefab structures had been constructed to restore activities, however, the situation is far from holding normal sessions. Thus the GOG emphasized the need for reconstruction of the permanent facilities and technical knowledge/skill transfer. To develop human resources, viewed from Japan, international cooperation would form one pillar of this, and viewed from India, the transfer of technologies from Japan would be an important element of human resource development. Looking at both viewpoints, it can be said that the pursuit of the potential support for the technical education is important. Further, the earthquake induced concern/interest about seismic activities and the GOG/GOI recognized the need for establishment of an institution for seismology. Hence an item for establishment of seismology institute was included.

The following are the requested items.

Institute of Seismology in Bhuj,
Engineering College in Bhuj,
Vocational Training Centre in Bhuj,
Pharmacy College in Lakhtar,

2) Rebuilding Plan for Regional Healthcare Facilities

The need for further assistance as a package project was expressed in order to provide

adequate healthcare services within Kutch district in recognition of the ability of JICA in rebuilding healthcare facilities from observing the reconstruction activities of CHCs at Anjar and Mundra. The package project consists of the following five items.

Mental Care and Rehabilitation Centre at Bhuj (Former Bhuj Mental Hospital):

Halfway Home (20 occupants), Shelter Rehabilitation Workshop (40 patients)

Expansion of Anjar CHC:

15 bedded Orthopaedic Ward, 10 bedded Rehabilitation & Physiotherapy Centre with equipments, Staff Quarters for Class III (12 units) and Class IV (20 units), an Ambulance

Regional Logistic Medical Store Centre at Bhuj

6 PHCs including Staff Quarters (7 units) in each PHC

5 Allopathic Dispensaries with Staff Quarters (5 units) in each Dispensary and 3 Sub Centres

The package includes the need for physical/mental care at the regional healthcare level, such as trauma care and physiotherapy/occupational therapy, which arose due to the earthquake and the extent of the need was recognized after rehabilitation and reconstruction activities began. In order to provide healthcare services to the local residents as soon as possible, the package also includes urgent reconstruction of PHCs, dispensaries and sub-centres, which was originally allocated to another NGO that had not carried out any reconstruction activities for the past 19 months.

Realization of the package would further signify the healthcare sector rehabilitation activity in Kutch as a whole with synergetic effect along with the reconstruction of the CHCs at Anjar and Mundra.

3) Community Training

Exploration of possibilities of participating in long term disaster management capacity building of communities through community trainings in collaboration with GSDMA was requested. The aim of this request was to transfer the know-how of evacuation training and to enhance preparedness to natural disaster at the local level which was being carried out at the prefectures level in Japan.

(4) Recommendations

For the purpose of keeping the newly built facilities' in good working order for a long time serving the people of Gujarat, proper maintenance and provision of necessary running costs are essential. Thus, it is recommended that the GOG monitors the conditions of the facilities and appropriate necessary fund for the maintenance and running costs of the facilities.

6. Items for Future Consideration

The QRS project comprising reconstruction of 5 primary schools and 2 CHCs was carried out as a part of this Project. There were many obstacles during the implementation of the QRS project, such as assistance agencies' running into each other at some of the sites, lack of site management skills of a contractor, etc. The communal riots between the Hindus and the Muslims started at the end of February 2002 especially affected the implementation of the QRS project. Most of the obstacles other than the ones caused by the communal riots, however, could be overcome by kind cooperation of concerned officials and representatives of the local people through out the implementation stage. It is hoped that the information in this report regarding the experiences of the JICA Project Team in overcoming the obstacles might be significant and useful data for future support/reconstruction activities by international/national organisations as well as the GOG/GOI.

It should clearly be understood that realization of Japanese international assistance programs is based on a mutual agreement between the central government of a recipient country and the GOJ and a request of the recipient country for assistance from Japan is prerequisite. The same shall be applied to the items mentioned in the Rebuilding Plan even if realization of them is strongly called for by the GOG. In view of urgency for realization of the items in the Rebuilding Plan, possibilities of other sources of assistance should also be sought for.