No.

JAPAN INTERNATIONAL COOPERATION AGENCY （JICA）
GOVERNMENT OF GUJARAT

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

FINAL REPORT

OCTOBER, 2002

YAMASHITA SEKKEI INC.
NIHON SEKKEI, INC.

S S F
J R
02－161

Currency Equivalents

Exchange rate effective as of June, 2001

Currency Unit = Rupee(Rs.) $ 1.00 = Rs. 46.0 1Rs.=2.66 Japanese Yen,1 Crore = 10.000.000,1 Lakh = 100.000

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.

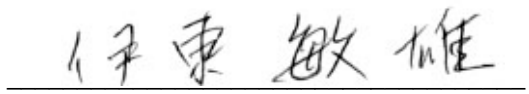
The study team of the Yamashita Sekkei Inc. and Nihon Sekkei, Inc. conducted surveys in India over the period between June 2001 and October 2002 as per the contract with Japan International Cooperation Agency. This report consists of summary, main and appendices volumes

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 Affaires of Japan, the Embassy of Japan in India, JICA Headquarters and JICA India office for their close cooperation extended to the project.

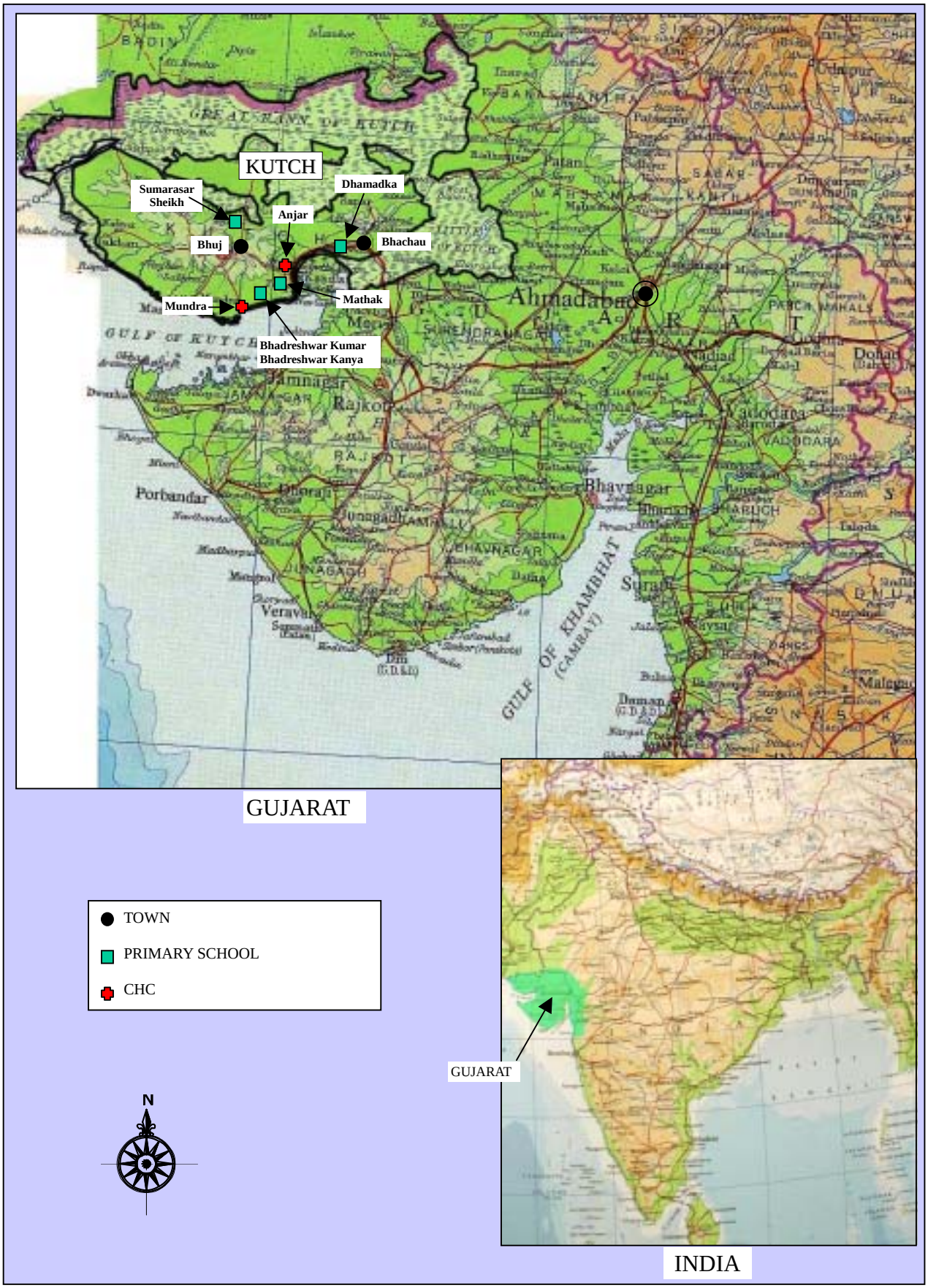
Finally, we hope that this report will contribute to further rehabilitation of the devastated areas.

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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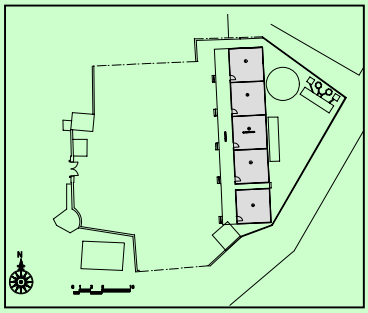

SUMARASAR SHEIKH PRIMARY SCHOOL

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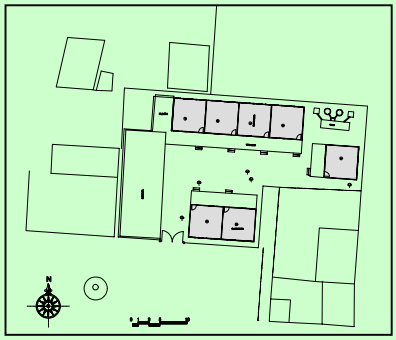

DHAMADKA PRIMARY SCHOOL

PHOTO & SITE PLAN

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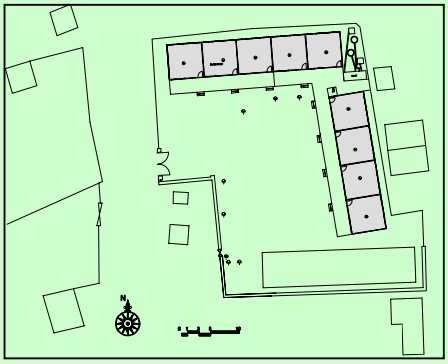

MATHAK PRIMARY SCHOOL

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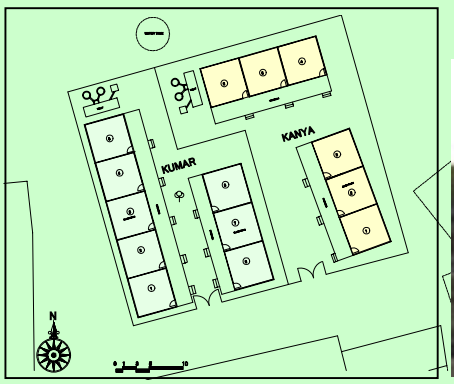
KUMAR

KANYA



BHADRESHWAR PRIMARY SCHOOLS (KUMAR & KANYA)

PHOTO & SITE PLAN

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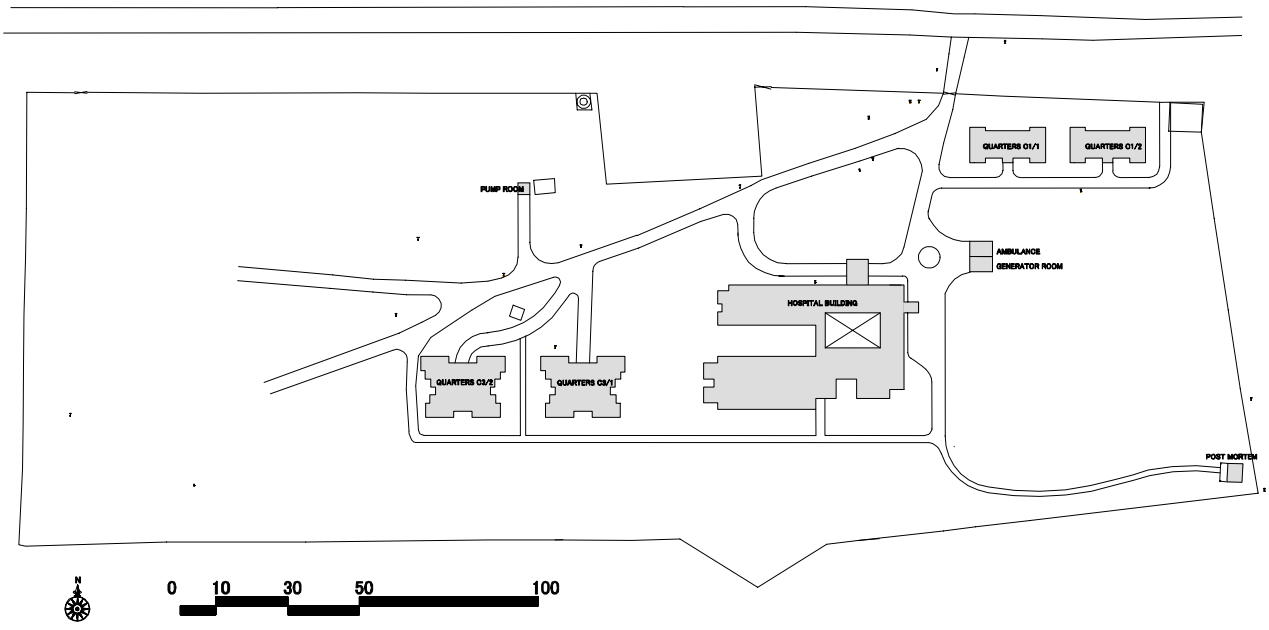

ANJAR CHC

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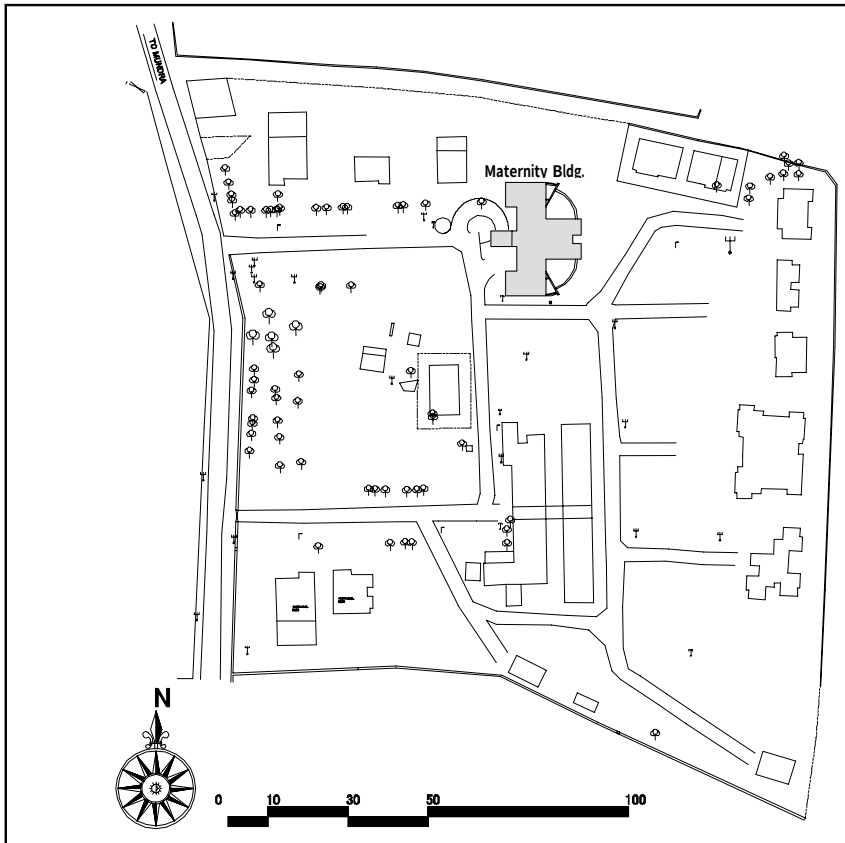

MUNDRA CHC

PHOTO & SITE PLAN

Abbreviations

ADB	Asian Development Bank
AICTE	All India Council for Technical Education
AMC	Ahmedabad Municipal Corporation
CBO	Community Based Organization
CDPO	Chief District Project Officer
CHC	Community Health Center
DOHFW	Department of Health & Family Welfare
DPEP	District Primary Education Program
GDP	Gross Domestic Product
GI	Galvanized Iron
GOG	Government of Gujarat
GOI	Government of India
GOJ	Government of Japan
GP	Gram Panchayat
GSDMA	Gujarat State Disaster Management Authority
GSDP	Gross State Domestic Product
GUDCOL	Gujarat Urban Development Corporation Ltd
HUDCO	Housing and Urban Development Corporation
IAS	Indian Administration Service
ICDS	Integrated Child Development Services
KNA	Kutch Navinirman Abihiyan
MCH	Maternal and Child Health
MOA	Ministry of Agriculture
MOF	Ministry of Finance
NGO	Non-Governmental Organization
NSDP	Net State Domestic Product
PHC	Primary Health Center
PVC	Polyvinyl Chloride
PWD	Public Works Department
RBI	Reserve Bank of India
R&B	Roads and Buildings Department
RCC	Reinforced Cement Concrete
SEWA	Self-Employed Women’s Association
UDD	Urban Development Department
UNDMT	United Nations Development Management Team
UNDP	United Nations Development Program
UNICEF	United Nations Children’s Fund
WB	World Bank
WFP	World Food Program
WHO	World Health Organization

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 ① Hospital Building (OPD, Diagnostic Dept., OT, Emergency room, 50 bed Ward) ② C1&2 Staff Quarters (2 bldgs. for 6 units) ③ C3 Staff Quarters (2 bldgs. for 10 units) ④ 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.

① 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)

② Construction of more classrooms

b) Rebuilding Plan for the Technical Educational Facilities

While domestic and overseas assistance powered 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.

① Institute of Seismology in Bhuj,
② Engineering College in Bhuj,
③ Vocational Training Centre in Bhuj,
④ 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.

① Mental Care and Rehabilitation Centre at Bhuj (Former Bhuj Mental Hospital):
Halfway Home (20 occupants), Shelter Rehabilitation Workshop (40 patients)
② 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
③ Regional Logistic Medical Store Centre at Bhuj
④ 6 PHCs including Staff Quarters (7 units) in each PHC
⑤ 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.

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PART 1

Fig.-1-1 Urban Area in Bhuj (June 11, 2001)

Chapter 1. Introduction

According to a recent announcement by the GOG on the earthquake, the total death toll in the State was 13,805. 1,103,000 houses were destroyed and the total direct damage due to the earthquake was calculated to be about 15,000 crores, and the reconstruction cost to be about 10,600 crores. The GOG has been striving to manage the financial burden firstly by self-restructuring of the financial system, by making use of WB and ADB loans and grants from various donors and trying its best to help mitigate and restore the damage of the affected area.

In response to the request of the GOI, the GOJ immediately extended emergency humanitarian supports including an emergency fund, materials and medical teams.

From the end of February 2001, the GOJ has been extending an emergency support program which was later titled as the Reconstruction Support for the Gujarat-Earthquake Disaster in the Devastated Areas in India (hereinafter referred to as the "Project"). A JICA Project Team was dispatched to the affected area and implemented the Project from the beginning of June 2001. This Report is to explain the Project with the contents as follows:

This Report has five parts.

Part 1 has three chapters to report the basic conditions of the Project.

Chapter 1 is an introductory report on the background, objectives, and scope of the Project.

Chapter 2 is to inform the overall situation of the affected areas, India, Gujarat, and Kutch District.

Chapter 3 is a report of a study to have an understanding of the needs of the Project in the educational and healthcare sectors as basic social infrastructures in the affected area.

Part 2 has one chapter.

Chapter 4 is a report of the Rebuilding Plan of the Project for the educational and healthcare sectors

in the affected areas including recent data of the disaster, other donors' actions, and reconstruction plans for future educational, healthcare and overall urban facilities based on studies and experiences through the implementation of a quick reconstruction support project (hereinafter referred to as the "QRS project").

Part 3 has three chapters, mainly a report on the implementing methodologies and processes of the QRS project to reconstruct classrooms for five primary schools and two community health centers (CHCs).

Chapter 5 is to introduce the needs of the QRS project for educational and healthcare facilities in the affected areas.

Chapter 6 is a report of the QRS project for basic educational facilities in the affected areas.

Chapter 7 is a report of the QRS project for basic healthcare facilities in the affected areas.

Part 4 has one Chapter.

Chapter 8 is an evaluation of the Project.

Appendix has two sections.

Appendix-1 is a record of official meetings, **Appendix-2** contains the chronicle of the Project and additional tables/figures.

1.1 Background

Quick Response Programme

The Japan International Cooperation Agency (hereinafter referred to as "JICA") Disaster Relief Programme is to quickly provide emergency relief when a major disaster occurs overseas, especially in developing countries. This programme covers dispatch of Japan Disaster Relief (JDR) Teams and provision of relief supplies.

Japanese Initial Action from January 30th, 2001

With profound sympathies and heartfelt condolences to the people of Gujarat in the aftermath of the devastating earthquake on January 26th, 2001, the Government of Japan (hereinafter referred to as the "GOJ") responded immediately to the tragedy and dispatched through JICA a JDR Team of 20 members, consisting of doctors and nurses on January 30th. The JDR Team provided intensive care to injured people in two areas near Bhuj.

Transport planes of the Japan Self-Defense Forces carrying tents and blankets arrived in Bhuj on February 7th and other relief supplies were supplied in the first week of February.

Rehabilitation Survey Mission from February 26th, 2001

Then a nine-member JICA mission for a background survey of earthquake disaster rehabilitation was sent to Gujarat from February 26th to March 5th.

Preparatory Team from April 8th, 2001

Based on the identified needs of the support to the reconstruction of the affected area surveyed by the mission, JICA sent a Preparatory Team from April 8th to 28th, 2001 to survey the earthquake-affected facilities for education and healthcare and to have discussions with the concerned authorities of the Government of India (hereinafter referred to as the "GOI"), such as the Government of Gujarat (hereinafter referred to as the "GOG"), the Ministry of Finance, the Ministry of Agriculture and the representatives of international organizations to preliminarily specify the Scope of Works for the "Reconstruction Support for the Gujarat-Earthquake Disaster in the Devastated Areas in India"

Identification and Specification of the Support on April 26th, 2001

The Ministry of Finance, the Ministry of Agriculture, the GOG and the Preparatory Team confirmed and signed the Scope of Works (hereinafter referred to as the "S/W") and the Minutes of Meeting (hereinafter referred to as the "M/M") for the "Reconstruction Support for the Gujarat-Earthquake Disaster in the Devastated Area in India" on April 26th, 2001.

1.2 Project Objectives

Four Objects of the Project

The objectives of the Project are to:

(1) formulate a rebuilding plan (Target Year, 2003) for educational and healthcare facilities that function as regional centers,

(2) construct classrooms of permanent prefabricated structures for five destroyed primary schools,

(3) construct healthcare facilities at two community health centers (CHCs); a 50 bed CHC in Anjar and a 14 bed maternity building in Mundra CHC, and

(4) introduce the experiences from the Project to the relevant organizations and local communities.

The objectives of the Project were discussed among the concerned authorities of the GOG and the JICA Project Team (hereinafter referred to as the "Project Team") on the bases of the Inception Report and S/W of the Project. As a result of the discussions, the above mentioned objectives were decided and mutually agreed among the parties before the implementation of construction work.

Possibility of Future Support

Following the objective to formulate rebuilding plans for educational and healthcare facilities, some highly prioritized educational & healthcare facilities were studied as potential projects for the Rebuilding Plan of the Project. However it should be understood that those potential projects are at the stage of preparatory study and are subject to further and thorough studies which are to be carried out mutually by both the GOG/GOI and the GOJ of their significances and possibilities.

1.3 Scope

The Project Area covers Bhuj, Anjar, Bhachau and Mundra Talkas in Kutch District in the State of Gujarat.

The scope of the Project is defined in the "Scope of the Project" agreed upon by the Ministry of Finance, the Ministry of Agriculture, the GOG and JICA on April 26th, 2001 as follows:

In order to achieve the objectives mentioned above, the Project covers the following items. It should be noted that the details of each item are determined along with available resources as the conditions of the Project:

(1) Review of existing reports and relevant information on the Project area

In order to identify the present situation, the Project Team used the results of the studies which

were carried out previously by other organizations, in particular, the GOG, Indian firms, International and Indian NGOs, the Netherlands Government and UNICEF, etc.
Such work was carried out in close coordination with these organizations.

(2) Review and analysis of current conditions of the Project area

1) Current damage situation
2) Socio-economic conditions
3) Natural conditions (including geography, geology, climate, land use patterns, etc.)
4) Review of the activities of other organizations (International organizations, NGOs, etc.)
5) Identification of issues and problems

(3) Preparation of the Rebuilding Plan for educational & healthcare facilities (Target Year: 2003)

(4) Construction of classrooms with permanent-prefabricated structures for primary schools.

1) Selection and confirmation of the construction sites
Basic issues being confirmed in order to finalize the selection of the sites were (a) ownership of the construction site (b) site clearance, (c) access road, water and electricity supplies, etc.

2) Planning
   (a) Preliminary design
   (b) Cost estimates
      - Construction work
      - Equipment work
   (c) Construction plan
   (d) Operations and maintenance plan
   (e) Organizational arrangements

3) Construction and preparation of implementation manual

(5) Construction of two CHCs

1) Selection and confirmation of two construction sites in Anjar and Mundra.
Basic issues being confirmed in order to finalize the selection of the sites were (a) ownership of the construction site, b) site clearance, (c) access road, water and electricity supplies, etc.

2) Planning

(a) Preliminary design

(b) Cost estimates

- Construction work
- Equipment work

(c) Construction plan

(d) Operations and maintenance plan

(e) Organizational arrangements

3) Construction and making implementation manual

Chapter 2. Affected Areas at a Glance

In this chapter the current situation of the affected area is reported as basic conditions for the Project. The population, natural conditions, socio-economic situation and cultural characteristics are reported.

It should be understood that the data shown here were based on the best data available to the Project Team during the implementation of the Project and are subject to update as rehabilitation and reconstruction of the damages in the State progress.

Fig.-2-1 Village people near Bhuj

2.1 India

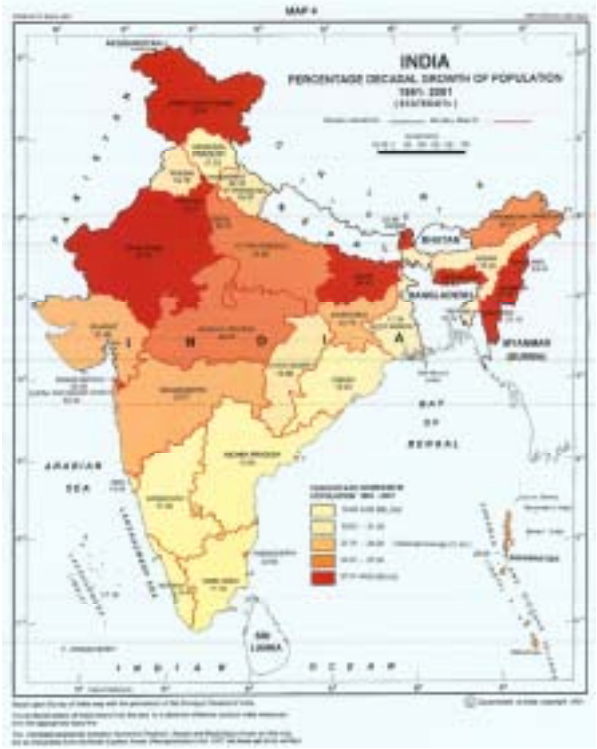


Fig.-2-2 Map of India (censusindia. net)

(1) Population

According to the Census 2001, the total population of India at 0:00 hours on 1st March, 2001 is 1,027,015,247.

(2) Natural conditions

India is in South Asia, between North latitudes 8 to 37.9 degrees, and between East longitudes 68.10 to 97.30 degrees. The Northwest border adjoins Pakistan, the North border adjoins Nepal, Bhutan, and China, and the East border adjoins Bangladesh and Myanmar. The surface area of India is 3.3 million sq. km, nine times as big as that of Japan.
The country has three major parts:

1) Himalayan Mountain region
   Steep mountainous region forming natural forts against the neighboring Asian countries.

2) Almost all parts of North India
   The India Ganges plain, enriched and fertilized by the Ganges, the Indus, and the Plamaptura.

3) Triangular Deccan region
   The plain created by two rivers, the Mahanadi and the Nalmada, is in the North part of this region. The East and West sides are the coastal plains. The central part of this region is the 1,000m high Deccan Plateau.

The climate varies in each region in terms of temperature, rainfall, wind etc. As for the India Ganges plain region the climate is:

- November to February is the cold season, with average temperature, 14.2 to 17.2 degrees centigrade.
- March to June is the hot season, with average temperature, 22.7 to 33.8 degrees centigrade.
- July to October is the rainy season, with average temperature, 26.2 to 33.8 degrees centigrade. The Monsoon season is hot and humid.

(3) Socio-Economic Situation

Mainly based upon the World Development Indicators Database, April 2001, the following figure shows the Socio-Economic situation of India:

		1999	2000
1)	GDP (current US $)	447.3 billion	479.4 billion
2)	GNP per capita (current US $)	457.6	466.0
3)	GDP growth (annual %)	6.5	5.8
4)	Inflation, GDP deflator (annual %)	3.3	6.9
5)	Current revenue, excluding grants (% of GDP)	12.3	not available
6)	Overall budget deficit, including grants (% of GDP)	-4.2	not available

(4) Human Development Index (HDI), India

As the Times of India released on July 24th the HDI India explains quite directly of the situation in India.

The HDI is a composite measure of human well-being based on literacy, life expectancy and per capita GNP annually surveyed by the UNDP.

India has moved up by 13 notches from 128 in 2000 to 115 in 2001. However, India still remains near the bottom of the middle human development category in the 12th UNDP Human Development Report released on July 11, 2001.

Norway leads the 162 countries followed by Australia and Canada. Sierra Leone is at the bottom of this index. Pakistan ranks 128 and Bangladesh ranks 132. Nepal and Bhutan are ranked 129 and 130 respectively.

According to a Technology Achievement Index (TAI) in a report "**Making new technologies work for human development**", India is ranked at the 63rd out of 72 countries and is positioned in the group of countries described as 'Dynamic adapters'. Nicaragua is at 64 in the group of 'Marginalized countries'. Top of the 'Leaders' is Finland followed by the US, Sweden, Japan and Korea.

The reason why India ranks as low as the 63rd, despite having the IT-city Bangalore identified as a **'Dynamic global hub'** is, the report says, the uneven diffusion of technology not only in India but also all over the world.

Huge variations in technological achievement among Indian States and the seventh largest number of scientists and engineers in the world are quite remarkable, yet adult literacy as per 1999, 44% was still and the average years of schooling was only 5.1. The global and information technology have brought about changes; industry generated 330 billion rupees in 1999, 15 times the level in 1990, exports rose from $150 million in 1990 to nearly $4 billion in 1999 and employment in the software

industry is projected to rise from 180,000 in 1998 to 2.2 million in 2008, to account for 8% of India's formal employment. India's remarkable progress in software industries has been achieved at a price. The costs of providing university education to these professionals represent a resource loss for India at $2 billion a year. 81,000 US visas were approved between October 1999 to February 2000. 40% of them were for individuals from India with more than half being those of computer-related jobs.

The brain-drain is influencing how the world views India by creating a sort of 'branding'. Biotechnology is also focused in the UNDP Report, which says this area can provide a way forward in medicine and agriculture, but it may be a long journey towards realizing the potential of biotechnology.

Despite the present situation all these indexes show, India has tremendous future possibilities depending upon its huge human resources which are not yet well educated and its natural resources which are not yet fully utilized.

India is the "Nation of Future".

2.2 Gujarat State

Fig.-2-3 Map of Gujarat (gujaratindia. com)

(1) Population

The population of Gujarat is 50,596,992 at 0:00 hours of 1st March 2001. Gujarat is one of 10 big States with a population more than 40 million of the 35 States in India and has a 5 % share of the total population of the country.

(2) Natural conditions

The State of Gujarat is in the West part of North India.
For the people here the climate is neither extremely hot nor extremely cold. It is moist in southern districts and dry in northern districts. The intensity of the climate is moderated by the Arabian Sea and the Gulf of Khambhat.
At the peak, the temperature is 45 and at times 46 degrees centigrade.
The average rainfall in the State varies from 35 to 155 centimeters with the southern parts averaging between 76 and 155 centimeters and the semi desert area of Kutch getting around 35 centimeters.

(3) Socio-Economic situation

According to the information provided by the Reserve Bank of India, the Socio-Economic situation of Gujarat State is as follows:

		Gujarat	India (as in **2.1**)
1)	GDP (current US $)	24.3 billion	447.3 billion
2)	GNP per capita (current US $)	507	457.6
3)	GDP growth (annual %)	2.5	6.5
4)	Inflation, GDP deflator (annual %)	6.1	3.3
5)	Current revenue, excluding grants (% of GDP)	12.5	12.3
6)	Overall budget deficit, including grants (% of GDP)	-5.5	-4.2

(4) The State Finance Figure

State Finance figures out the political status of the State and shows the potentiality of the State to manage the rebuilding and restructuring of the social infrastructure of the affected districts. The following table is also from the sources of the Reserve Bank of India:

Table-2-1 State Finance Figure

% of GSDP (Gross State Domestic Products)

Structure of State Economy	85-90	91-97	96-97	97-98	98-99
Total revenue	12.8	12.6	11.2	12.0	12.5
State Own Revenue	10.0	10.1	8.8	9.5	10.2
Central Transfers	2.9	2.5	2.3	2.5	2.3
Total Expenditure	17.1	15.3	13.9	15.3	18.0
Revenue Expenditure	14.0	13.1	11.8	13.1	15.3
Interest payment and debt servicing	1.5	2.0	1.9	2.0	2.2
Capital Expenditure (net)	3.2	2.2	2.0	2.3	2.7
Revenue Deficit (-)	-1.1	-0.5	-0.7	-1.1	-2.8
Gross Fiscal Deficit (-)	-4.3	-2.7	-2.7	-3.4	-5.5
Total Outstanding Debt	19.5	20.6	21.3	18.4	18.4

The Table above shows the pre-earthquake situation. Even before the disaster the total outstanding debt was 18.4% of the GSDP.

The percentage of central transfers to the total revenue is only 18.4%, figuring out the financial status of the State in general. The State Government governs itself by almost 82% of its own revenue. These two financial factors basically have some influence to the reconstruction and restructuring of the social infrastructures of the devastated area.

2.3 Kutch District

The book ‘Kuchchh, the Crown of Gujarat’, written by K.N. Menon, describes Kuchchh or Kutch as an erstwhile princely State of India. It is the largest district of the State and the second largest district in the country covering an area of 45,612 square km.

The land is like an island surrounded by seawater, which enters through many creeks from the Arabian sea into “The Great Rann of Kutch” in northern Kutch near by the border of Pakistan

There is another dry land called “Little Rann” in South-eastern Kutch close to many districts surrounding Ahmedabad Municipality.

There are many good ports along the southern shore of Kutch open to the Arabian Sea; Porbandar, Bhavnagar, Mandvi, Mahuva and many others, which have prosperous conditions for the growing industries in Kutch.

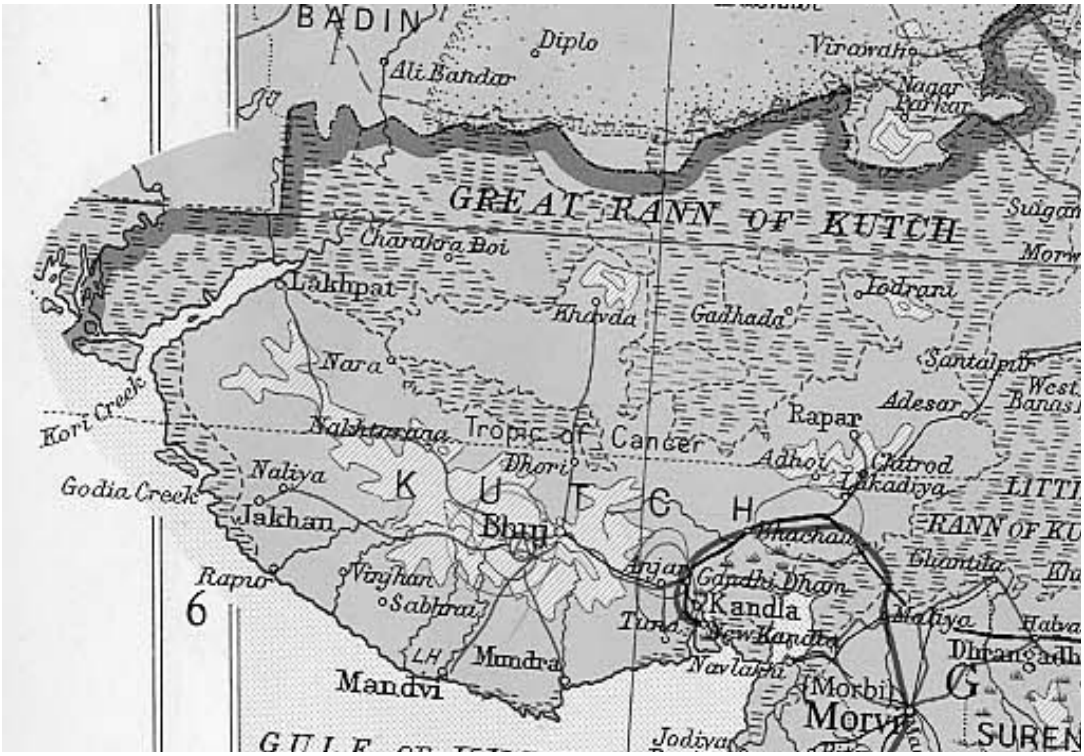


Fig.-2-4 Map of Kutch District (The Times Atlas of the World)

(1) Population

The Population of Kutch district was 1.26 million according to the census of India 1991 and 1,526,326 according to the 2001 version. This is 3.0 % of the Gujarat population and 0.149 % of the Indian population. The web site gujaratindia.com has detailed population of Talukas in Kutch district as follows:

Table-2-2 Population of Kutch District

Taluka No.	Name of Taluka	Village No.	Gujarat India Com.
1.	Abdasa	165	97,871
2.	Anjar	67	85,651
3.	Bhachau	71	120,439
4.	Bhuj	158	195,258
5.	Gandhidham	8	26,404
6.	Lakhpat	100	45,949
7.	Mandvi	91	136,748
8.	Mundra	60	71,250
9.	Nakhatrana	132	146,180
10.	Rapar	97	167,564
Total		949	1,093,313

Though the total figure of the table does not much with that of the census 2001 and need to be further clarified, it shows the fundamentals of each Taluka at present.

(2) Natural conditions

The land receives an annual average rainfall of 340 mm. Thus Kutch is categorized as a Semi-Arid tract zone. About 73 % of the total area is wasteland, while forest area constitutes only 6.3 % and has high salinity and humidity.

Kutch has a tropical monsoon climate and the rainfall generally occurs between June to September. Kutch is susceptible to drought and earthquakes.

The temperature varies from minimum average of 4 degrees centigrade in winter to maximum averate of 45 degrees centigrade in summer. The mean wind speed is about 11 km / hour and relative humidity is about 60 %.

(3) Socio-Economic situation

According to "The Monthly Review of the Gujarat Economy", the following explain the Socio-Economic situation of Kutch District.

The figures of Ahmedabad are also listed up for comparison:

		Kutch	Ahmedabad
1)	Population (million)	1.526	5.808
2)	Urbanization (Urban / Rural population)	30.72	74.69
3)	Density (per square km)	334	667
4)	Villages electrorized (numbers / numbers)	876/949	646/648
5)	Primary schools	1,437	2,368
	Students enrolled	232,600	949,900
	School teachers	5,269	18,750
	Students / teacher	44	51
6)	Secondary schools	153	762
	Student enrolled	44,900	313,800
7)	Primary health centers	37	1,013

All figures are of the pre-earthquake situation.

(4) Social Structure

According to a book named "Kachchh, the Crown of Gujarat", as per the 1991 census, out of 1.26 million people 0.875 million people live in villages and 0.388 million people live in urban areas.

There are 875 inhabited villages and 10 towns in Kutch. Out of the total population in Kutch, 75.41 % are Hindus, 19.64 %, Muslims, 4.58 % Jains, 0.18 % Sikhs, 0.17 % Christians, and 0.01 % Buddhists and others. About 11.90 % comes under the category of scheduled caste of which 6.59 % are termed as scheduled tribes.

Chapter 3. Current Situation of Educational and Healthcare Sectors in the Affected Area

This chapter includes studies to have an understanding of the needs of the Project in educational and healthcare sectors as the basic social infrastructures in the affected area.

Fig.-3-1 Indian Institute of Management in Ahmedabad

3.1 Education and Healthcare as Social Infrastructure

In India elementary education and primary healthcare are categorized as public social infrastructures and each State government has responsibilities to provide appropriate programmes and facilities to the people of the State with support and guidance of the Central Government.

(1) Educational Framework of India

The basic frame of education in terms of age and class is described in the following table:

Table-3-1 Educational Framework of India

-EDUCATION OF INDIA OVERVIEW P9, ELEMENTARY EDUCATION-

Courses		Class	School	Age
Higher Education Master Course	Year 2			23
Higher Education Master Course	Year 1			22
Higher Education Degree Course	Year 3			21
Higher Education Degree Course	Year 2			20
Higher Education Degree Course	Year 1			19
Higher Secondary Education	Year 2	Class XIII		18
Higher Secondary Education	Year 1	Class XII		17
Secondary Education	Year 3	Class XI		16
Secondary Education	Year 2	Class X		15
Secondary Education	Year 1	Class IX		14
Primary Education	Year 8	Class VIII	Upper primary school	13
Primary Education	Year 7	Class VII	Upper primary school	12
Primary Education	Year 6	Class VI	Upper primary school	11
Primary Education	Year 5	Class V	Primary school	10
Primary Education	Year 4	Class IV	Primary school	9
Primary Education	Year 3	Class III	Primary school	8
Primary Education	Year 2	Class II	Primary school	7
Primary Education	Year 1	Class I	Primary school	6

The school attendance rates of the country reported in the book are 63.7% at class V and 43.5% at class VIII.

The policy of the GOI is to solve this poor attendance rate with objectives described in the next section.

(2) Policy of Elementary Education

The Universalisation of Elementary Education (UEE) has been accepted as a national goal in India.

1) Constitution

The State shall endeavor to provide free and compulsory education for children up to 14 years of age within 10 years.

Free and compulsory education of satisfactory quality should be provided to all children up to the age of 14 year before the commencement of the 21st Century as a National Policy of Education (NPE)

2) The 9th 5 year Plan

Three Board Parameters, Universal Access, Universal Retention, Universal Achievement are planned:

① **Universal Access**

- Universal enrolment of all children, including girls, disabled children, and children belonging to Scheduled Castes (SCs) and Scheduled Tribes (STs) in primary classes and provision of upper primary education for them.
- Provision of Non-formal Education (NEE) for school drop-outs, working children and girls who cannot attend formal school.
- Provision of early childhood care and education to children of 3-6 years of age.

② **Universal Retention**

- Reduction of dropout rates between classes I-V and classes I-XIII from the existing rates of 36.3% and 56.5% to 20% and 40%, respectively.

③ **Universal Achievement**

- Expansion of Minimum Levels of Learning (MLLs) to all primary schools and extension of this concept to upper primary stage.
- Substantial improvement in school infrastructure, teacher education and in quantity and quality of teaching-learning material.
- Promotion and extension of the national curricular framework at the elementary stage which envisages a common core with adequate flexibility to the environment and the needs and interests of the learners.

(3) Organizational Structure of Education in India

The following diagram from the book “Education in India” shows the organizational structure of education in India.

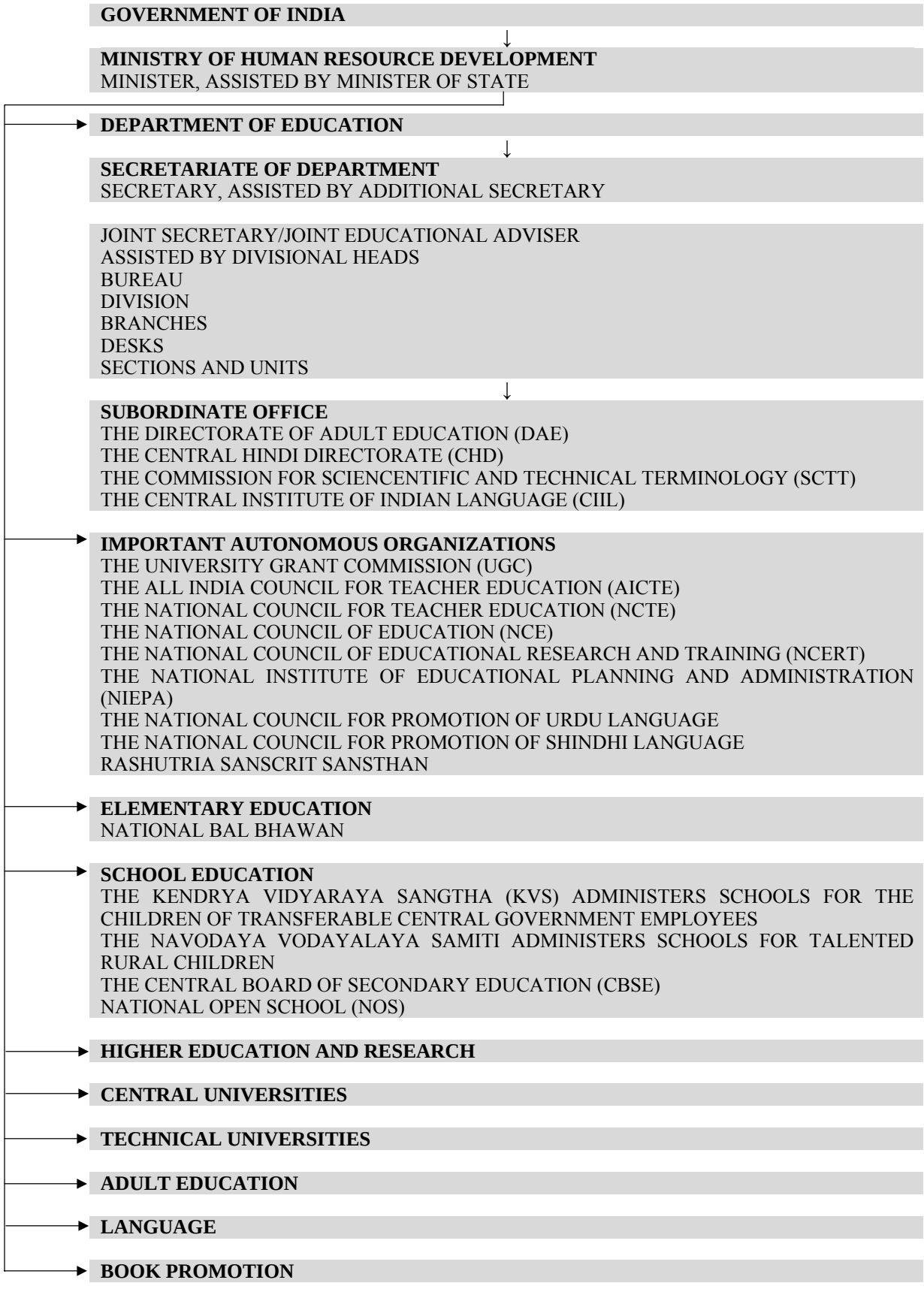


Fig.-3-2 Organizational Structure of Education in India

(4) Educational Situation in India

1) **Drop-out Ratio**

According to the Education in India in the year 2000, the dropout ratios of up to the 5th grade and 8th grade are 36.3% and 56.5% respectively. At present, the Universal Retention, one of the Educational Basic Implementation Programs of India, has objectives to make them 20% and 40% respectively. Moreover, according to the India in New Millennium (written by Dr. P. C. Alexander, issued in April in the year 2001), the program that universal and free primary education to be applied to all children up to 14 years old, was supposed to be completed within 10 years after its institution as stipulated in Article 45 of the national constitution. However, after 50 years, it has not been achieved to date, and the dropout ratio in India is the worst in the world.

The dropout ratios of rural areas where socio-economic development have fallen behind and of girls have especially increased. Further, there are issues such as non-enrollment and school non-attendance. For girls, the dropout ratio in elementary education is 49.9% and in secondary education 63.8%. Within 60 thousand villages in total, half of the villages have a population of less than 500 and one quarter have a population between 500 and 1000. A large distance between villages and the small populations are the bar to the spread of primary education.

Although there is a program to provide primary educational facilities in all the villages, the number of schools is still insufficient and there are many children who have no way to go to school. Moreover, the number of educational equipment and human resources are also insufficient.

The lean circumstances of schools as mentioned above are depressing incentives for increase of school attendance. The above-mentioned are considered to be the major reasons for the high drop-out ratio.

2) **Socioeconomic Reason**

The investigation conducted 10 years ago revealed that 40% of the total primary education facilities had temporary school buildings, 39.71% had no blackboards, 59.5% had no drinking water facilities and 66% had no playgrounds. Moreover, 60% had only two teachers and 35% had only one teacher, and surprisingly, there was even no teacher for some hundreds of

elementary schools.

It is said that teachers dislike to be posted to the outer rural areas where the "quality of life" is low. The absence of teachers is a social problem.

These circumstances of primary education are incurring the deterioration of the levels of secondary education as well as higher education. In any case, improvement of the environment for primary education is a responsibility of the State government.

3) **Gender Disparity**

The school non-attendance ratio of girls is significant. Major reasons for the girls' non-attendance are that they are responsible for household affairs and play important domestic roles; e.g. drawing water, bonfires, cooking, looking after children, etc., and that uneducated parents think that girls' education is a waste of time and money and welcome the non-attendance.

The above matters have implications in the education issue of adult women. The mothers, as uneducated adult women, cannot understand the need of primary education for their daughters. However, the occupation of teacher seems to be suitable for women, and the number of female teachers is in the increase.

One State is trying to improve the non-attendance phenomenon by providing a feeding service, uniform, text book, stationary, arrangement of audio-visual educational equipment, etc. Improvement of socio-economic conditions is of the essence for solving this matter.

4) **Disparity between Tribes**

The author, B. K. Anitha states, in his publication, "Village, Caste and Education", for the disparity between tribes in the primary education of rural community, as follows;

In a society ridden by caste hierarchy, it is imperative to understand how caste plays a significant role in determining the accessibility to education, the quality of transaction that takes place in the classroom and the response of the communities and teachers to education. Indian rural societies are still characterized by their caste-class nexuses that form overarching determinant of access and control of any form of resources distribution amongst various caste groups which also form and integrate a part of rural fabric. Education as a social institution and a resource for upward

mobility, therefore, is political; the transactions and interactions between the teacher, student and community represent most often different slices of the society.

Thus, it is quite natural that the village structure normally includes the caste and there is an unavoidable caste-class nexus, and it becomes also a cause of the disparity between caste classes. It is said that such phenomenon exists even in Kerala State, which is known as an educational State.

Many of the teachers are from upper caste class and do not prefer contacting with the parents of pupils, and it becomes a bar to the establishment of a good relationship between the education and the region.

It is reported that both the Enrolment Ratio and the Drop-out Ratio are significant in the lower caste class. The village structures consist of roughly three categories such as the scheduled caste/schedule tribe village, the village of various castes and the village of a couple of castes, and the environment of education is being improved in the above mentioned order.

5) **Rate of Sufficiency of Facility**

The population of Kutch district is 1,526,326; the population ratio of children aged from 6 to 13 years old is 21.44% (Population Education & Family Planning – published in New Delhi, 2000), which is equivalent to 327,244. With reference to Table 5-1, the number of accommodating children is 201,932 and the rate of sufficiency of facility is 61.7%.

The school age bracket of the age structure of the population of Kutch seems to have a larger ratio at present, therefore a rate of sufficiency of facility will be approximately 60% as the actual number of school age children will be greater than that at the time of the report.

Moreover, according to the national census in 2000, the rate of population growth was a large value of 20.9% in the last decade, and an estimation of sufficiency rate of the facility in 2010 will probably be less than 50%.

In other words, the children who will be possible to go to school will be less than 50% of the total number of the school age children in the year 2010, and even if the drop-out ratio decreases to 40% by then, the number of children having been through the primary educational course at the end of primary education will only be 20% of the total enrolled children. This will be a serious situation.

The reconstruction of primary educational facilities should be preceded taking the above matter into account, and in this view it is apparent that the expansion of educational facilities is desirable rather than the restoration of facilities.

(5) Status of Healthcare in India

Improved nutrition and better living conditions may have doubled the average Indian life expectancy since independence, however, infant mortality rate (IMR) of the country still continues to be high. The Human Development Report 2001 of UNDP shows that IMR in India continues to be about 70 per 1,000 live births for the past few years, several times higher than the IMR of several developing countries like Indonesia, China, Vietnam, Iran and Sri Lanka, which have brought their IMRs down to 38, 33, 31, 37 and 17 respectively. IMR is a crucial indicator of the overall well being of a country.

Immunization against diseases like tuberculosis and measles also continues to be poor, way below the average of those other countries. Sri Lanka, for instance, has reached close to 100% immunization; 97% of the children are immunized against TB and 95% against measles. In India, 72% of the children are immunized for TB and only 55 % for measles.

Despite the huge success of pulse polio vaccination programmes, the immunization level for all other diseases has shown a decline. This has led to sporadic outbreaks of these diseases, especially diphtheria and measles. Even countries ranking below India on the HDR index, show a better immunization level at 97% for TB and 86% for measles in average.

Over 50% of children under five are underweight for their age. Poor nutrition continues to be a major problem. An extensive National Family Health Survey showed over 70% children in most States suffer from iron-deficient anemia, affecting their growth and development.

According to a survey, it is reported that 44.2% of children have anemia in not just the backwater of Bihar, but also Maharashtra, Gujarat, Punjab, Kerala, where children are generally better nourished.

The ratio of physicians to the population continues to be poor: only 48 physicians per 100.000 populations while China has ratio of 162 physicians per 100.000 population. While the public health scenario needs major improvements, the Report has expressed concern over the increasing prevalence of HIV/AIDS. The epidemic has been likened to the 14th century plague that swept through Europe.

In India, there are 1,300,000 women and 160,000 children living with HIV.

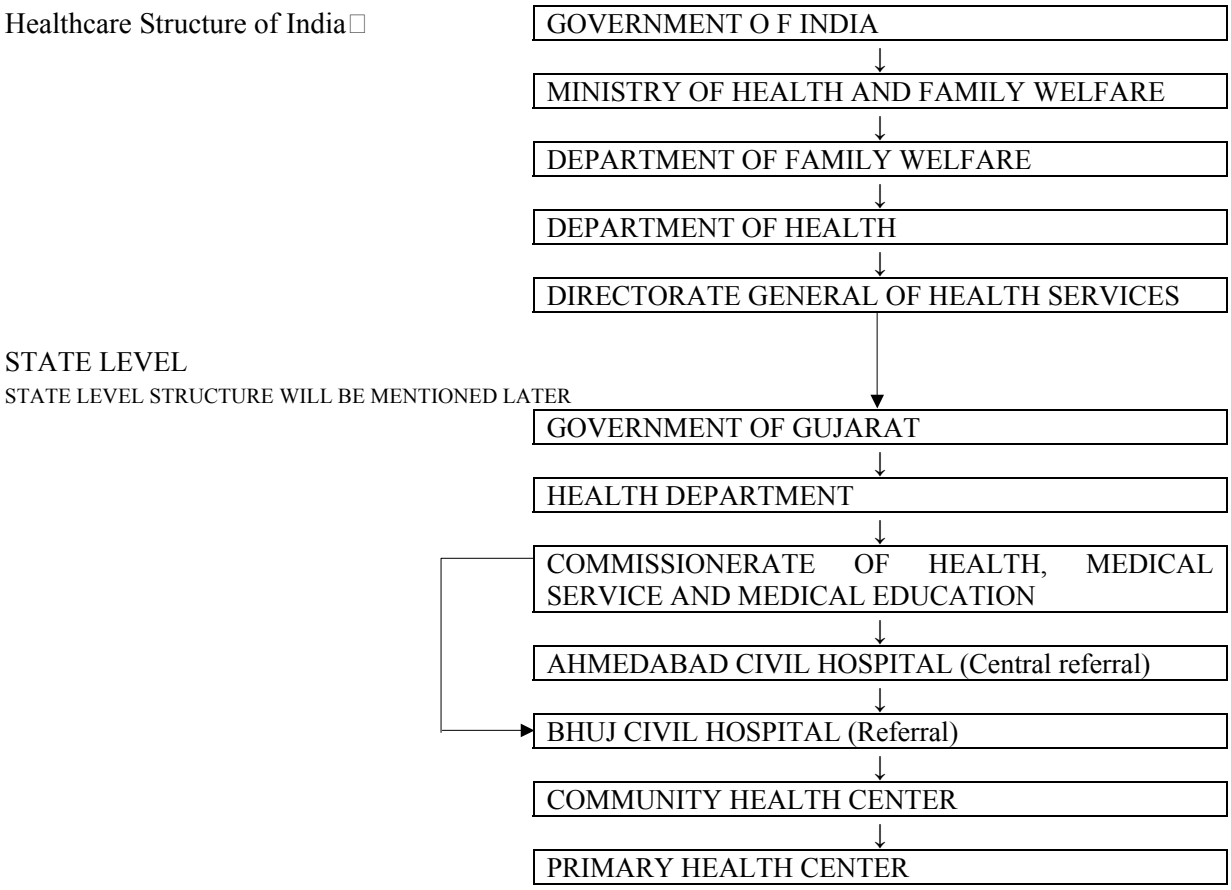


Fig.-3-3 Healthcare Structure of India

(6) Approach and Objectives for the Five Year Plans in Healthcare

According to the Report on National Profiles on Women, Health and Development, the national policies for healthcare are outlined in the Five Year Plans as follows:

FIVE YEAR PLANs	Main Objectives for the Healthcare sector
First Five Year Plan 1951-61	Establishment of Department of Preventive and Social Medicine Launching of Primary Health Center Launching of Community Development Programme 1956.
Secondary Five Year Plan 1956-61	Nationwide coverage of Primary Health Centers Campaign to eradicate malaria by mid sixties launched National Venereal Disease Control Program launched in 1956.
Third Five Year Plan 1961-66	Designed plans for a self-reliant economy by 1975-76 The Mudalia Committee noted that the Primary Health Center network that had evolved bore no resemblance to that visualized by Bhore Committee. **Primary Health Centers were to be consolidated rather than expanding services, especially related to Primary Centers.** The Family Planning Programme emerged as the focus of planned development, and the Clinic approach was abandoned in favour of the Extension approach for motivating small family norms and for provision of services.
Fourth Five Year Plan 1969-74	Strengthening of facilities in existing public health units.
Sixth Five Year Plan 1980-85	Introduction of National Health Policy Focus on strengthening, consolidation, and operationalisation of the network Introduction of National Mental Health Programme in 1982
Seventh Five Year Plan 1985-90	National AIDS Control Programme was launched in 1987 National Diabetes Control Programme was initiated in 1987 Sought to eliminate poverty by the year 2000; achieve full year employment; satisfaction of basic needs and Health for all. Envisaged universal immunization of expectant mothers, and all eligible children by 1990 Family welfare programme was implemented with greater vigour to achieve a couple protection rate of 42% by the end of the Seventh Plan period. 20-point programme was restructured.
Eight Five Year Plan 1992-97	Goal was on human development. National Child Survival and Safe Motherhood Programme were launched in 1992. Revised National Tuberculosis Control Programme (RNTCP) with DOTS was introduced from 1993. Development of ISM & H was also established in the MHFW in 1995. The Reproductive and Child Health Programme launched in October 1997.
Ninth Five Year Plan 1997-2002	Optimize coverage and quality of healthcare. This is done by; a. Identifying and rectifying the critical gaps in infrastructure, manpower, equipment, essential diagnostic regents and drugs. b. Enhancing the efficiency of the health system.

Fig.-3-4 Approach and Objectives for the Five Year Plans

(7) Major National Health Programmes

In line with the Five Year Plans the Government of India has been carrying out National Health Programmes shown in the following table:

-BASED ON NATIONAL PROGILES ON WOMEN, HEALTH AND DEVELOPMENT

YEAR	National Health Programmes	Comment
1952 1977 1997	National Family Planning Programme Family Welfare Productive and Children Health	National Family Planning Programme was modified in 1977 and in 1997 to expand its coverage.
1953	National Malaria Eradication Programme	
1955	National Filarial Control Programme	
1956 1983	National Diarrhoeal Disease Control Programme	Smallpox has been eradicated from India.
	National Leprosy Control Programme National Leprosy Eradication Programme	
1962 1993	National TB Control Programme Revised TB Control Programme	The revised TB Control Programme based on DOTS directly observed treatment, short course initiated in selected Districts.
1963 1976	National Trachoma Control Programme National Blindness Control Programme	Blindness Control Programme addressed nutritional blindness due to vitamin A deficiency and cataract related blindness.
1962	National Goiter Control Programme National IDD Control Programme	
1982	National Mental Health Programme	
1987	National AIDS Control Programme	Initiated as a vertical Programme received a boost when the budget allocation was dramatically increased in 1992. Attempts to integrate with STD Programme and later to incorporate it as part of RCH programme are being made.
1983	National Programme for Guinea worm Eradication	This is considered one of the successful National Health Programmes.
	National Cancer Control Programme	
	National Diabetes Control Programme	
1978	Expanded Programme of Immunization	Being integrated in to RCH programme at present though it started as a vertical programme and later as part of MCH.

Fig.-3-5 Major National Health Programme

(8) Average Population Served by Rural Health Centers, 1996

The Pre-earthquake status and planned norms are as in the Tables below:

Table-3-2 Healthcare Framework of India

No.	ITEM	POPULATOIN NORM	AVERAGE POPULATION SERVED
1	SUB-CENTER	3,000-5,000	4,734 (4-7 villages)
2	PHC	20,000-30,000	27,375 (25-27 villages)
3	CHC	100,000+	100,000+

Function of CHC in the structure of Healthcare Services

(Based on National Profiles on Women, Health and Development)

The healthcare service presently provided has a network of Sub-centers, Dispensaries, Primary Health Centers (PHCs), Community Health Centres (CHCs) of the Government in rural areas, and hospitals in Government as well as private health sectors. The population coverage norm for PHCs is 30,000 rural populations against 20,000 as recommended by the Bhore Committee, except in hilly areas (20,000 for tribal and hilly areas) sub-centers for 5,000 populations. The norm for the Rural Health Structure is given in this table. The distribution of PHCs and Sub-centers in the different States and the actual population served by them is given in Table-3-3.

A Medical officer and ANM (female healthcare workers) manage the PHC. Male healthcare workers provide services at sub-centers under the supervision of a Medical Officer. The CHC that has a 30 or more bed hospital building and the district level civil hospital provide referral support to the PHCs. CHCs cater to 90,000 to 100,000 populations covering several PHCs in the area.

The number of functioning CHCs, which form the First Referral Unit (FRU) is far below the projected requirement. During the Ninth Plan, all the States are to restructure the existing sub-district, Talka hospitals and Block level PHCs into functioning CHCs. The current large gaps in functioning CHCs should narrow substantially with the completion of the process of restructuring. Similarly, restructuring existing rural health centres and dispensaries to meet the requirement of PHCs is necessary.

(9) PHCs and Sub-centres, 1996

The number of population, PHCs, Sub-centres in each State is reported in the National Profile on Women, Health, and Development as in the Table below: The rural population of Gujarat was 28.280 million at the time.

Table-3-3 PHC & Sub-centre 1996

-Based on National Profile on Women, Health and Development

STATES	PHCs (Numbers)	Rural (Population: million)	Sub-centers (Numbers)	Rural-Population/SCs (Actual)
Mizoram	38	9.784	261	1.425
Sikkim	24	15.394	147	2.513
Arunachal Pradesh	47	16.041	223	3.381
Meghalaya	88	16.417	337	4.287
Jammu & Kashmir	335	17.550	1,700	3.458
Manipur	72	18.493	420	3.170
Himachal Pradesh	246	19.194	1,908	2.475
Karnataka	1,495	21.295	7,933	3.887
Kerala	959	22.334	5,094	4.205
Tamir Nadu	1,436	25.614	8,681	4.237
Orissa	1,056	25.970	5,927	4.627
Rajasthan	1,572	27.590	8,692	3.905
Gujarat	957	28.280	7,284	3.715
Maharashtra	1,695	28.552	9,725	4.976
Punjab	484	29.552	2,852	5.010
Uttar Pradesh	3,761	29.648	21,153	5.533
Nagaland	33	30.348	244	4.10
Haryana	379	31.257	2,299	5.398
West Bengal	1,556	31.279	7,873	6.271
Assam	619	32.191	5,280	3.774
Goa	21	32.859	175	3.943
Bihar	2,209	33.962	14,799	5.061
Madhya Pradesh	1,376	36.969	11,936	4.260
Tripura	63	37.071	537	4.349
Andhr Paradesh	1,283	37.896	7,894	6.159
Andaman and Nicobar	17	12.100	96	2.143
Chandigarh	-	-	12	5.516
D. and Nagar Haveli	6	21.125	34	3.728
Daman and Diu	4	13.511	19	2.844
Delhi	8	118.627	42	22.596
Lakshadweep	7	3.288	14	1.614
Pondicherry	26	11.185	79	3.681
All India	21,854	28.764	1,327,340	4.737

(10) Healthcare Facilities Required and Present Status

Basic healthcare facilities required in each State as of 1991 are listed in the table below. The shortfall percentages in Gujarat are +17.9% for Sub-centers, -6.6% for PHCs, -27.6% for CHCs. The rural population has been increasing in Gujarat so the shortfall percentages are presumably shifting to worse. The actual present situation is studied in the later sections.

The pre-earthquake situation of the basic healthcare facilities in Gujarat is given in the Table-3-5.

Table-3-4 Sub Centers PHCs and CHCs Required and in Position

-Based on National Profile on Women, Health and Development

REQUIRED: AS PER 1991 POPULATION IN POSITION: 1997

No.	STATES/UTs	Sub-centres			PHCs			CHCs		
		R	P	S	R	P	S	R	P	S
1	Andhra Paradesh	10,242	10,568	-	1,707	1,335	372	427	207	220
2	Arunachal Pr.	220	223	-	37	47	*	9	9	0
3	Asam	4,356	5,280	*	726	619	107	181	105	76
4	Bihar	15,825	14,799	1,026	2,637	2,209	428	659	148	511
5	Goa	138	173	-	23	18	5	6	5	1
6	Gujarat	6,168	7,274	-	1,028	960	68	257	186	71
7	Hayana	2,482	2,299	183	414	397	17	103	64	39
8	Him. Pr.	973	1,980	-	162	260	*	40	42	*
9	J & K	1,176	1,700	-	196	335	*	49	45	4
10	Karnataka	6,431	8,093	-	1,072	1,509	*	268	232	36
11	Kerala	4,325	5,094	-	721	956	*	1,800	80	100
12	M.P.	12,122	11,937	185	2,020	1,376	644	505	190	315
13	Majarashtra	10,533	9,725	808	1,756	1,695	61	439	300	139
14	Manipur	344	420	-	57	72	*	14	16	*
15	Meghalaya	464	337	127	77	81	*	19	10	9
16	Mizoram	122	324	-	20	38	*	5	6	*
17	Nagaland	325	244	81	54	33	21	14	5	9
18	Orrissa	6,374	5,927	447	1,062	1,056	6	265	157	108
19	Punjap	2,858	2,852	6	476	484	*	119	105	14
20	Rajastan	7,484	9,400	-	1,247	1,616	*	312	261	54
21	Sikkim	85	147	-	14	24	*	4	2	2
22	T.N.	7,424	8,681	-	1,237	1,436	*	309	72	237
23	Tripura	579	537	42	96	56	40	24	11	13
24	U.P.	22,337	20,153	2,184	3,728	3,761	-	931	262	69
25	W.B.	10,356	7,873	2,483	1,726	1,556	170	431	89	342
26	Andaman & Nicovar	45	96	*	7	17	*	2	4	*
27	Chandigarh	13	12	1	2	-	2	1	1	-
28	D& NH	40	34	6	7	6	1	2	-	2
29	D. & Diu	12	21	*	2	3	*	*	1	*
30	Delhi	190	42	148	32	8	24	24	-	-
31	Lakshadweep	7	14	*	1	4	*	*	3	*
32	Pondicherry	58	80	*	10	43	*	*	4	*
	All India	134,108	136,339	7,727	22,349	22,010	1,966	5,587	2,622	2,976

Source: Rural Health Statistics in India, Director General of Health Services, M/O HFW

Figures: R: Required P: In position -: Nil *: Surplus Infrastructure S: Shortfall

Table-3-5 Pre-earthquake figure of Basic Healthcare Facilities – based on GOG

No.	District	No. of PHCs	No. of CHCs	No. of Sub-centres
1	Jamnagar	58	16	445
2	Kneda	93	19	591
3	Kutch-Bhuj	37	12	251
4	Mahsana	81	17	515
5	Pemchmahal	108	24	732
6	Rajkot	43	17	330
7	Sabarkantha	55	18	413
8	Surat	67	17	601
9	Surendranagar	28	10	200
10	Ahmedabad	48	10	322
11	Amreli	33	12	239
12	Banaskantha	67	12	478
13	Vadodara	78	15	487
14	Bhavnagar	46	15	397
15	Bharuch	52	10	292
16	Valsad	66	17	611
17	Dang	7	1	47
18	Gandinagar	8	1	58
19	Jamnagar	36	10	265
	Total	**1,011**	**253**	**7,274**

3.2 Current Situation of Education in the Affected Area

Table-3-6 Preliminary Report of Damage to Primary School Rooms –Based on GOG

No.	District	Total No. of Rooms	No. of Rooms Damaged			Estimated Cost in Rs. Lakhs		
			Collapsed	Damaged	Total	Collapsed	Damaged	Total
1	Kutch	5,126	3,858	1,000	4,585	5,736	500	6,236
2	Ahmedabad	5,016	-	1,976	1,976	-	348	348
3	Rajkot	6,207	1,216	3,145	4,361	1,946	350	2,296
4	Jamnagar	4,271	433	2,815	3,248	693	192	885
5	Surendranagar	3,826	272	2,486	2,758	435	703	1,138
6	Banaskhantha	8,651	601	3,738	4,339	962	1,800	2,762
7	Gandhinagar	3,507	-	43	43	-	7	7
8	Patan	3,779	591	998	1,589	600	150	150
9	Mahsana	5,850	-	507	507	-	150	150
10	Amreli	918	-	325	325	-	125	125
	Total	**47,181**	**6,698**	**17,033**	**23,731**	**10,372**	**4,325**	**14,697**

From the Table above, the number of collapsed classrooms of schools in Kutch district is 3,858. The total number of classrooms collapsed is 6,698, 54% of which are in Kutch. The ratio of collapsed classrooms to damaged classrooms (C/D Ratio) in Kutch district is 385.8% as No. 1 in the listed Districts indicating the scale of devastation in the epicenter zone. In Ahmedabad district the C/D Ratio is 0% showing the characteristic of devastation in the central city. Almost all of the 1,976 classrooms were only partially damaged. It does not mean the classrooms are safe. A school collapsed on a day 3 months after the earthquake and a boy died under the debris. Many schools are suffering such kind of fear and Ahmedabad Municipal Corporation (AMC) is in difficulties to manage

to get rid of the possibilities of collapse of buildings which still exist. Rajkot district is at No.2 in terms of collapsed number of classrooms and at No.3 in terms of the C/D Ratio, at the southeast side of Kutch district and despite being a bit far from the epicenter. Banaskantha district is at No.3 as per the total number of collapsed and damaged classrooms, and at No.2 as per the total rebuilding cost is at the north-east side of Kutch district and northern part of the State.

The total number of collapsed classrooms is 6,698 and damaged classrooms are 17,033. The total number of classrooms is 23,731. The existing total number of classrooms in the State is 47181 as shown in the Table above. So around 50% of all classrooms were affected and 14% of them collapsed.

A primary school is supposed to have an average number of four classrooms, so the number of schools affected is around 11,800 in the State and around 1,146 in Kutch district.

Assuming each classroom to have 36 children (approximately 38 children were observed and mentioned in Part 3 later), the table discloses approximately 240,000 children were learning without school and totally 854,316 children were suffering difficulties of learning somehow. The number of children might increase if the schools adopt some multiple shift system in using classrooms.

How huge the scale of the devastation by the earthquake and how quite immense number of children has been learning without classrooms are implicated in the simple table above.

No further information will be needed to confirm the validity of reconstruction support to the primary educational facilities as a basic social infrastructure in the affected area.

The total estimation of the reconstruction cost is Rs. 146.97 crores by the table. The WB estimates the total reconstruction costs to be Rs. 307.0 crores in its Gujarat Earthquake Recovery Program (Assessment Report, Annex 4), approximately twice as expensive as that of the cost in the table. The difference might be according to the exactness of the estimation due to the timing, more than one month later than that of the GOG estimation.

The summary of damage assessment in educational facilities in all, from primary schools and to colleges was reported on March 14, 2001, as in the table below by the World Bank:

Table-3-7 Summary of Damage Assessment

No..	Sub sector	No. of Institutions Affected	Estimated Cost Rs. Crores
1	Primary Education		
	• Primary Schools	9,593	307.0
	• Teacher Training institutions	42	14.9
	• Kitchens	1,871	3.7
2	Secondary Education		
	• Government Schools	127	22.3
	• Grant-in-aid Schools	1,913	200.0
3	High Education	47	40.9
4	Technical Education	58	81.8
5	Private Educational institutions	Not available	Not available
	Total	**13,581**	**670.5**

3.3 Current Situation of Healthcare in the Affected Area

Brief report of the earthquake in general and the recent general situation of the affected area will be given in the next Chapter.

In this section only the statistics data of how many basic healthcare facilities have been destroyed so far is given according to the resources released by the counterpart of the Project.

Table-3-8 Hospitals Destroyed

No.	DISTRICT	TALUKA	No.	NAME OF HOSPITAL	ARRANGED BY
1	Kutch-Bhuj	Bhuj	1	General Hospital, Bhuj 500 beds (ex. 281 beds)	Primary Minister Office Central Government Project
		Gandhidham	2	Government Hospital, Gandhidham 50 beds (ex. 50 beds)	Indian Medical Association
		Bhuj	3	Mental Hospital, Bhuj 50 beds (ex. 20 beds)	European Commission
		Mandvi	4	General Hospital, Mandvi 100 beds (ex. 100 beds)	Delhi Municipal Corporation
2	S'nagar	Limbadi	5	General Hospital, Limbadi 120 beds (ex. 120 beds)	Gem & Jewelry Limited
		S'nagar	6	General Hospital Surendranagar 120 beds (repair) (ex. 120 beds)	European Commission
		Dhrangadhra	7	General Hospital, Dhrangadhra 50 beds (repair) (ex. 50 beds)	European Commission
3	Jamnagar	Jamnagar	8	General Hospital, Jamnagar 700 beds (ex. 600 beds, increase new 100 beds)	European Commission
4	Rajkot	Morbi	9	General Hospital, Morbi 200 beds (ex. 200 beds)	European Commission

Table-3-9 Primary Health Centers Destroyed

No.	DISTRICT	TALUKA	No.	NAME OF HOSPITAL	ARRANGED BY
1	Kutch-Bhuj	Bhuj	1	Kukma	IDBI
			2	Dhori	Indian Red Cross
			3	Dhaneti	IDBI
		Anjar	4	Bhimasar	Indian Red Cross
			5	Dudhai	Indian Red Cross
			6	Khedoi	Indian Red Cross
		Bhachau	7	Manfara	Indian Red Cross
			8	Kataria	CII
			9	Adoi	MP LAD
		Rapar	10	Suvai	Indian Red Cross
			11	Adesar	Indian Red Cross
			12	Fatehgadh	Save the Children
		Mundra	13	Vanki	Indian Red Cross
		Mandvi	14	Godhra	Indore Malwa
		Abdasa	15	Mothara	Indian Red Cross
2	Jamnagar	Dhrol	16	Latipur	Indore Malwa
			17	Jalia Devalia	Indian Red Cross
		Jodiya	18	Amran	LIC Employee's Union
			19	Hadiyana	LIC Employee's Union
			20	Balambha	Chowgule
		Kalawad	21	Bhalsan	Indore Malwa
			22	Nikava	Indian Red Cross
		Jam Kalyanpur	23	Bhatiya	Indian Red Cross
			24	Ran	Indian Red Cross
		Jamnagar	25	Jan-Vanthali	Indore Malwa
			26	Banug Bagthalaar	Indore Malwa
		Maniya-Miyan	27	Khakhrechi	Indian Red Cross
			28	Vavaniya	Indian Red Cross
		Morbi	29	Bagthala	IDBI
			30	Rajpar	IDBI
			31	Jetpur (Machhu)	Indian Red Cross
		Paddhari	32	Khod Pipar	Indian Red Cross
		Gondal	33	Sltanpur	Indian Red Cross
4	S'dranagar	Lakhtar	34	Dhanki	Indore Malwa
		Halvad	35	Mayurnagar	Indore Malwa
		Limbadi	36	Zinzuvada	Indore Malwa
		Wadhavan	37	Kharaghoda	Indore Malwa
			38	Talsana	LIC Employee's Union
			39	Rampara	Karuna Trust
			40	Methan	Karuna Trust
5	Patan	Sami	41	Sami	IMA
			42	Mujpur	Indian Red Cross
			43	Rafu	IMA
		Patan	44	Vagdod	Indian Red Cross
		Harji	45	Nana	IMA

Table-3-10 Community Health Centers Destroyed

- Based on the same data as previous tables.

No.	DISTRICT	TALUKA	No.	NAME OF HOSPITAL	ARRANGED BY
1	Kutch-Bhuji	Anjar	1	Anjar	JICA
			2	Mundra (Maternity Building)	JICA
		Bhachau	3	Bhachau	Gem & Jewellery
			4	Lakadiya	J.W. Global
			5	Rapar	Gem & Jewellery
2	Jamnagar	Jodiya	6	Jodiya	Malayala Manorama
		Kalawad	7	Kalawad	Shakti Kripa Charitable Trust
3	Rajkot	Maliya Miyana	8	Maliya Miyana	M.P. LADS
4	Patan	Chansama	9	Lanva	
		Santalpur	10	Santalpur	European Commission
		Radhanpur	11	Radhanpur	European Commission
5	S'nagar	Dhrangadhra	12	Rajistapur	GOG
6	Bhavnagar	Bhavnagar	13	Vartej	GOG

The data in the tables from Table-3-8 to Table-3-11 describes not only the scale of devastation but also how the NGOs and other agencies are in charge of the restoration of the damaged healthcare facilities. All theses post-earthquake situations should be studied compared with the pre-earthquake situations in the **Table-3-5**.

Focusing on the Kutch District, 15 of 37 (40.5% of all) PHCs were destroyed.

5 of 12 (41.7% of all) CHCs were destroyed of which 2 CHCs are arranged by JICA as in the **Table 3-10**.

95 of 251 (37.8% of all) Sub Centres were destroyed of which 71 (74.7% of all destroyed) are managed by UNICEF. (Refer to Appendix)

Table-3-11 Dispensaries Destroyed

No..	DISTRICT	TALUKA	No.	NAME OF PHC	FUNDING AGENCY
1	Kutch-Bhuji	Bhachau	1	Anjar	CII
			2	Samakhiyali	Indian Red cross (proposed)
			3	Bharudiya	Indian Red cross (proposed)
		Rapar	4	Rav	Indian Red cross (proposed)
		Mundra	5	Nani Tumbadi	Indian Red cross (proposed)
			6	Vadala	Indian Red cross (proposed)
			7	Ratadiya	Indian Red cross (proposed)
		Abadasa	8	Dumra	Indian Red cross (proposed)
			9	Nudhatad	Indian Red cross (proposed)
		Anjar	10	Ratnal	MERLIN
		Mandvi	11	Moti Bhadai	Action Ministries
			12	Kotdi Mahadevpuri	Action Ministries
			13	Nana Asamiya	Action Ministries
		Bhuj	14	Kotda	CFA
2	S'nagar	Dhrangadhra	15	Malvan	Indian Red cross (proposed)
3	B.K.	Kankrej	16	Umbari	Indian Red cross (proposed)

- Analysis of Damage

The damage assessment carried out by the WB and brief figures in the previous tables are analysed in the next table to show the current situation of basic healthcare facilities in the affected area:

Table-3-12 Analysis of Damage

No..	Type of Damage	Complete Damage (units)	Partial Damage (units)	Damage to Building (Rs. crores)	Damage to Equipment (Rs. crores)	Total (Res. crores)	Recent Destroyed
1	Sub-centre	227	357	36.2	-	36.2	181
2	PHC	48	118	50.2	4.3	54.5	45
3	CHC	21	46	57.5	9.6	67.1	13
4	District Hospital	5	26	28.5	3.2	31.7	9
5	Others	-	-	29.9	0.2	30.1	-
	Total					**219.6**	

The cost is shown in Rs. Crores. The data shown are from DOHFW as of March 14, 2001, while the data of the "Recent Destroyed" in the last column is as of June 20, 2001.

"Others" here means other healthcare facilities including ICDS, CDPO, dispensaries, training centers, medical colleges, food and drug laboratories and so on.

"Recent Destroyed" means recent situation of destroyed basic healthcare facilities to be reconstructed by GOG, GOI, NGOs, and JICA. The numbers of "Complete Damage" given by the WB and that of "Recent Destroyed" are close to each other:

	WB	DOHFW/GOG (recent)	
Sub-center	227	181	Almost same
PHC	48	45	Almost same
CHC	21	13	Some to be retrofitted
Hospital	5	9	WB count some as others

In Part 3 the figures are different for each item due to the differences of the released timing of data.

PART 2

Chapter 4. Rebuilding Plan for Educational and Healthcare Sectors

In this chapter the Rebuilding Plan for educational and healthcare sectors is explained on the basis of available information to the Project Team and from its studies and the experiences during the implementation of the QRS project for the primary schools and the CHCs.

This Rebuilding Plan is to find out the potential needs for further supports by the GOJ in line with, and to help activate the programmes being made up as the Town Plan Development by the GOG.

Needless to say a rapid deployment should be taken and has already been carried out to an extent by the authorities concerned for the rehabilitation of the people whose houses were lost or seriously damaged by the earthquake of the Republic Day. The villages were reduced to rubble and the towns were piled up as heaps of debris in and around the Kutch District, but most of them are still badly waiting to be rebuilt or relocated. Quite a big amount of monetary aid, initially said to be about Rs. 70 crores, were offered by several countries, however, the GOG has received only 0.3% of them as of the end of July, 2001, a small sum of only over Rs. 228,400 compared with the State's budgetary provisions of Rs. 7,000 crores for the relief of an estimated direct loss of Rs. 11,000 crores caused by the earthquake.

Such slowing down phenomenon of support momentum from foreign countries, other States and NGOs were observed not only of village or town wise whole rehabilitation but also of the basic educational and healthcare rebuilding.

As for schools, a mere 165 schools out of a total of 4,862 taken up by NGOs for reconstruction have been constructed so far as of August 18th, 2001.

The healthcare activities in the affected areas were started firstly in tents and then in temporary facilities and will be housed in and carried out in the newly constructed facilities some day in future. This procedure seems to be well organized and strongly supported by UNICEF, Red Cross Society and others. But as the GOG admitted in its Human Development Index for 2010, the assistance of foreign agencies, up to Rs. 3,780 crores, will be indispensable to achieve the target.

Some facilities of higher education and technical education also collapsed due to the earthquake. To revitalize the industries in the Kutch District and the Gujarat State, the rebuilding of technical educational facilities will be crucial and assistances from technologically developed countries such as Japan would be of great help.

In line with the context above, the Rebuilding Plan is described in the following sections.

4.1 Recent Situation of the Earthquake Disaster

(1) Brief Note of the Earthquake

The earthquake was recorded as having a magnitude of 6.9 on the Richter scale, with an epicenter 70 km East of Bhuj, 12 km North of Bhachau and at 16-18km in depth. 17,143 people died and 1,102,317 houses were damaged according to recent information of the GOG. The location of Bhuj is in the Map below.

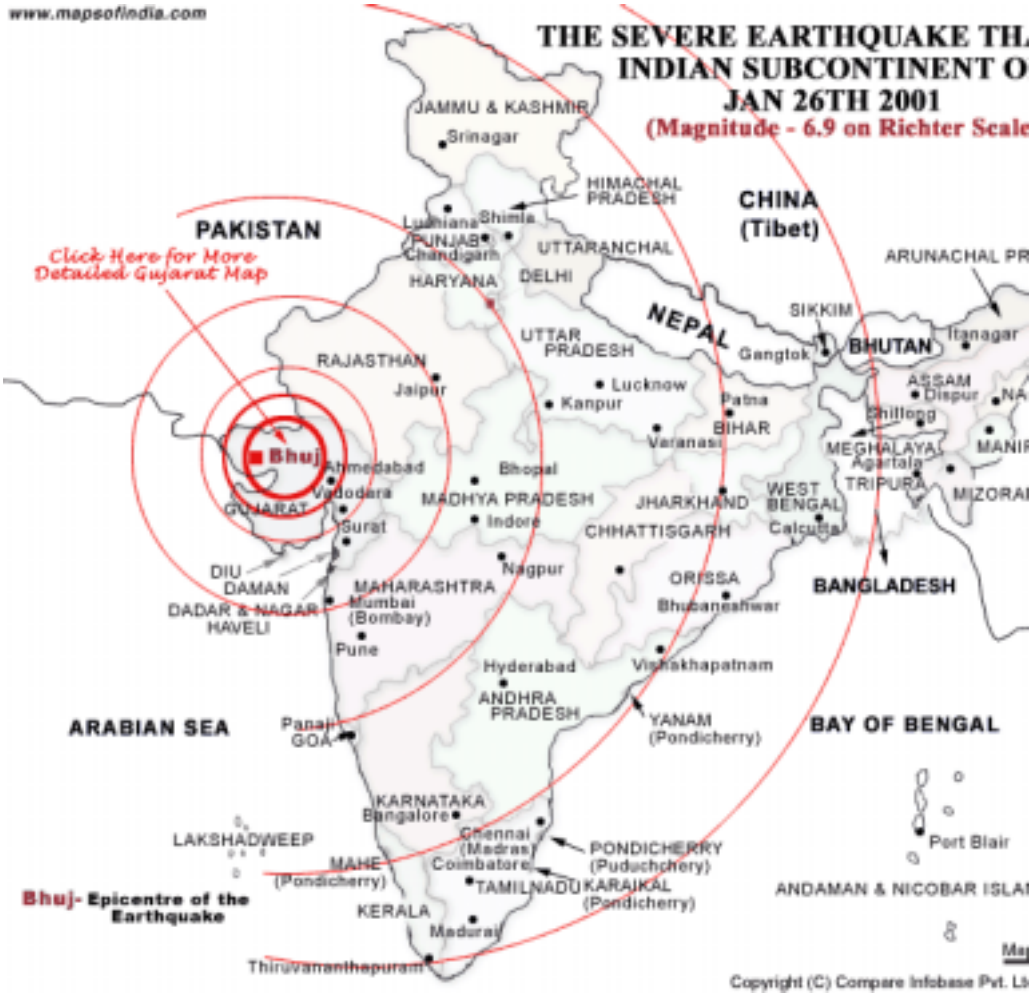


Fig.-4-1 Map of the Bhuj Earthquake (gujaratindia.com)

(2) Worst Affected Villages

The worst affected villages are in four talukas, Anjar, Bhachau, Bhuj and Rapar as listed in the Table-A-2 in the attached Appendix-2.

The QRS project sites except for the Mundra CHC are in and nearby Anjar, Bhuj, and Bhachau towns. This means that the Project Team has carried out most of the support activities in and around the

center of the worst affected areas and has seen the rehabilitation and reconstruction activities of other assistance agencies, NGOs as well as the GOG.

Fig.-4-2 Image of Devastation

(3) Strategy of the GOG

The GOG responded rapidly to the earthquake damage by taking various operations to restore the deteriorated areas and decided an administrative directive as EARTHQUAKE-2001 Rehabilitation Package No.5 on June 24th,2001 as briefed hereinafter.

Resolution

An earthquake of magnitude 6.9 on the Richter scale struck Gunarat on 26th January 2001 and caused substantial loss of life and infrastructure. In order to enable people to reconstruct their houses, the GOG declared five rehabilitation packages earlier for all affected areas other than the four municipal towns of Anjar, Bhuj, Rapar and Bhachau where a separate package was introdueced. The nature and extent of damage in these four towns needed a special package which would address various issues like relocation, in-situ reconstruction, town planning and infrastructure, striking a fine balance between the needs and wants of those affected.

A policy had to be evolved involving people in a participatory manner, evaluating the different views of various sectors of the affected population, keeping in view international experience and applying it to the present context. The policy, which addresses various issues involved, takes times to evolve synthesizing different views. After due deliberations and careful consideration the GOG has finalized a package for the municipal towns of Bhuj, Anjar, Bhachau and Rapar.

Objectives

- Provision of adequate opportunities for development of private housing.
- Development of new areas with required infrastructure facilities.
- Provision of modern improved infrastructure facilities in the areas of Health and Sanitation, Roads, Education, Water Supply and Power.
- Introduction of a modern town planning system for overall development.
- Restoration and up-gradation of places of cultural and heritage importance.
- Restoration of development of community assets.
- Restoration of economic livelihood by various means including setting up of training institutes for skill up-grading/development.
- Reconstruction of settlements with the advice of qualified and experienced Scientists, Geologists, Seismologists, Engineers and town planners.

The GOG is committed to fulfill the objectives by implementing rehabilitation in two phases-(1) short term plan for immediate requirement and (2) medium & long term plan for improved infrastructure facilities with one decade perspectives.

Short Term Plan

- Restoration of essential infrastructure likes water, sewage, electricity etc.
- Provision of technical know-how for design and construction of earthquake resistant buildings.
- Facilitation of loans at reduced rates of interest from HUDCO in addition to the assistance to be provided by the government.

Medium and Long Term Plan

- Restoration and up-gradation of infrastructure.
- Technical assistance for repair of existing buildings.
- Laying of modern infrastructure system.

The Setting Up of Area Development Authorities

The creation of a new area development authority in each of those towns was contemplated in view of the need for a new systematic and coordinated approach to reconstruction of these earthquake ravaged towns. There is a need for new and upgraded infrastructure. The area development authorities

would continue for a temporary period of 3-5 years for the purpose of implementation of overall reconstruction in accordance with town development plans being prepared for each town on the basis of all relevant considerations. The authorities would be for overall planning, setting out and implementing development regulations and for creation/up-gradation of infrastructure. They may levy service charges for the new services provided by them. However, eventually the Municipal Authorities will undertake all municipal services like water, sewage, health and electricity. The authorities will support construction activities and the creation of new infrastructure. The government land could be vested in the Authorities.

They will facilitate:

- Setting up of a technical cell to assist people for preparing building plans.
- Training of engineers to help people to be aware of technical requirements of reconstruction.
- Panelling of structural engineers to assist the review and clearance of building plans.
- Reconstruction and repairs to the maximum extent possible.
- Capacity building of the Municipalities to eventually handle the municipal services.

A well thought out development plan was formulated including various activities such as:

- Widening of roads to ensure safe access and speedy evacuation. Minimum road lines may be decided for the major roads & minor public roads.
- Realignment to be attempted for genuine reasons, inter-area traffic-related issues, requirement of a utility, better town planning.
- Inclusion of adequate open spaces.
- Dislocation to be minimized without compromising on safety and accessibility.
- Detailed city surveys carried out will be taken into consideration.
- Loss of property to be compensated through a combination of financial assistance or providing alternative land.
- Relocation of certain public places like bus-stations, jails, wholesale markets etc., if necessary to avoid congestion.
- Adjoining suitable areas to be included in development plans to allow proper extension of infrastructure to cover new areas.

Special Focus on Infrastructure Development

The rehabilitation & reconstruction project for four towns envisages the inclusion of housing and urban infrastructure. The Gujarat Urban Development Company (GUDC) will implement the project in two phases:

- The first phase corresponds to the draft development plan for the four towns of Anjar, Bhuj, Bhachau and Rapar by the Town Planning Department of Gujarat with the assistance of consultants, selected on the basis of competitive bidding in conformity with the requirements of multilateral donor agencies.

- The second phase contemplates the design and supervision for rehabilitation and reconstruction of urban infrastructure with the support of consultants.

Financial Package for Sustaining the Municipalities

- Suspension of property tax and other taxes for a year.
- Grant-in-aid to sustain the municipalities.

Participatory Approach

- Participatory decision making with the involvement of the community in the implementation.
- Involvement of NGOs and other voluntary agencies.
- Involvement of corporate houses in providing private houses and public infrastructure.

Private Housing

Compensation and loan system have been planned and executed by the government.

(4) GSDMA

GSDMA was established in early February, 2001 as the nodal organization for disaster management of the State. Outline of GSDMA is as follows:

The GOG established GSDMA on February 8, 2001 in order to co-ordinate the comprehensive earthquake recovery programme. GSDMA is registered as a society under the Societies Registration Act. The objectives of GSDMA are:

- To undertake social and economical activities for reconstruction & resettlement of the affected people that would include new housing, infrastructure, economic rehabilitation, social

rehabilitation and other related programmes.

- To prepare programmes and plans to mitigate the losses on account of disasters as strategy for long term disaster preparedness.

- To undertake research and study regarding causes for losses on account of natural disasters and to suggest remedial measures for minimizing the same.

- To obtain funds for rehabilitation and resettlement and to ensure optimum utilization of these funds in the form of grant, aid, assistance or loan from the GOG, the GOI, the WB and ADB, USAID, DFID, IFRC, other donors, financial institutions, the public and private trust and any other organizations.

- To manage the Gujarat Earthquake Rehabilitation Fund.

- To act as a nodal agency, and to co-ordinate various issues relating to the deserving victims out of the funds, either directly or through a common fund, created for these purposes in any other feasible mode.

- To arrange financial assistance so as to achieve the objects of the society.

- To raise money through financial instruments, bonds, deposits and such other manner as may be permissible under the provision of the Society Registration Act, 180 and Bombay Public Trust Act 1950.

- To develop an approach, philosophy, policy guidelines and action plans and other relevant aspects for responding to disasters of any kind;
  management, administration, investment & re-investment of funds out of sale proceeds received from the sale of land, building, equipment, furniture, debris, or any other things or articles or infrastructure.
- To act as a nodal agency and to co-ordinate various issues related to the maintenance of hygienic living conditions, welfare of victims, environmental maintenance and such other welfare measures, as may be assigned to the deserving authority.

- To do all the acts and things conducive for the attainment of the above objects in the most possible manner, which are relevant to fulfill the objects of the society.

(5) Reconstruction of Village Structure

Collapse of Village Structure

As mentioned in the World Bank Report, most of the villages inspected by the survey team have a village structure of the scheduled castes/scheduled tribes territory, i.e. a peculiar space for certain caste communities.

The people who were there are eager to return to that area where their village structure existed before collapse as a community of blood relations and blood relatives even though there were congested housing, narrow paths and no sewerage system.

In case that the program is reconstruction of the previous village for the community, a careful approach to such territorial area is needed. In the case of the relocation program, which is eliminating the old territorial structure, the strong characteristic tribe has even disagreed to the relocation.

In fact, in the case of Dudhai village where the program was implemented at an early stage and praised, although most of the Koly, Bawa and Meghwar tribes agreed to the relocation, approximately 200 people of Koly did not agree because it is far from the cultivation field as they said. However, the true reason of disagreement is said to be that they refused to be mixed up with other tribe's territory at the new place.

Disparity between Caste Classes

Both the saving pursuers and the reconstruction pursuers are being upset about the tribe problem, and according to an activist of the St. Xavier Social Services Group, because of the strict structure of caste in Kutch district, most of the relief goods are not going to the lower caste class but becoming an upper caste class possession.

Many of the NGO activities are, because of the lack of experience for a convergence caste structure and unsuitable approach, being refused by the village community.

This was one of the reasons why the achievement of primary education facility aid was slow.

As of June 26, 2001, there was a report that only 130 cases out of 350 objective villages for NGO activities were going well.

Violence between Tribes

On June 13, 2001, at a village 30 km away from Rapar, 9 were dead and 22 were injured in violence between the Koly and Ghadvi tribes.

The cause of that incident was reported to be the conflict of approximately 250 leasehold acres, but there was also a case of the murder of 2 victims 12 years ago, and it was regarded that there had been a rather deep conflict between caste classes rather than a simple leasehold problem.

As mentioned above, the convergence structure of caste is seriously affecting the formulation of village reconstruction and urban redevelopment programs in Kutch district.

Ideal Approach / Ideal Planning Methodology

For the tribe territory matters, the urban redevelopment program of Bhuj adopts a western style functional urban structure rather than a traditional cultural structure for town planning.

On the other hand, the urban redevelopment program of Bachau reserves as much as possible the cultural remains, religious structure and old city community structure.

This difference is probably for the reason that Bhuj is the town of the district having a potential basis for modern urban development while Bachau is a slightly more rural town and this difference is noted.

It is desirable that the persistent urban development will be done in the course of communication with the community and not through the conceptual program of a planning specialist, and it is thought that the program, achieved through the approach to the community, has a long life. Fig.-4-3, 4, 5 shows the villages core images which will be restructured in line with the context above.

Fig.-4-3 Devastation of Bhadreshwar Boy's School

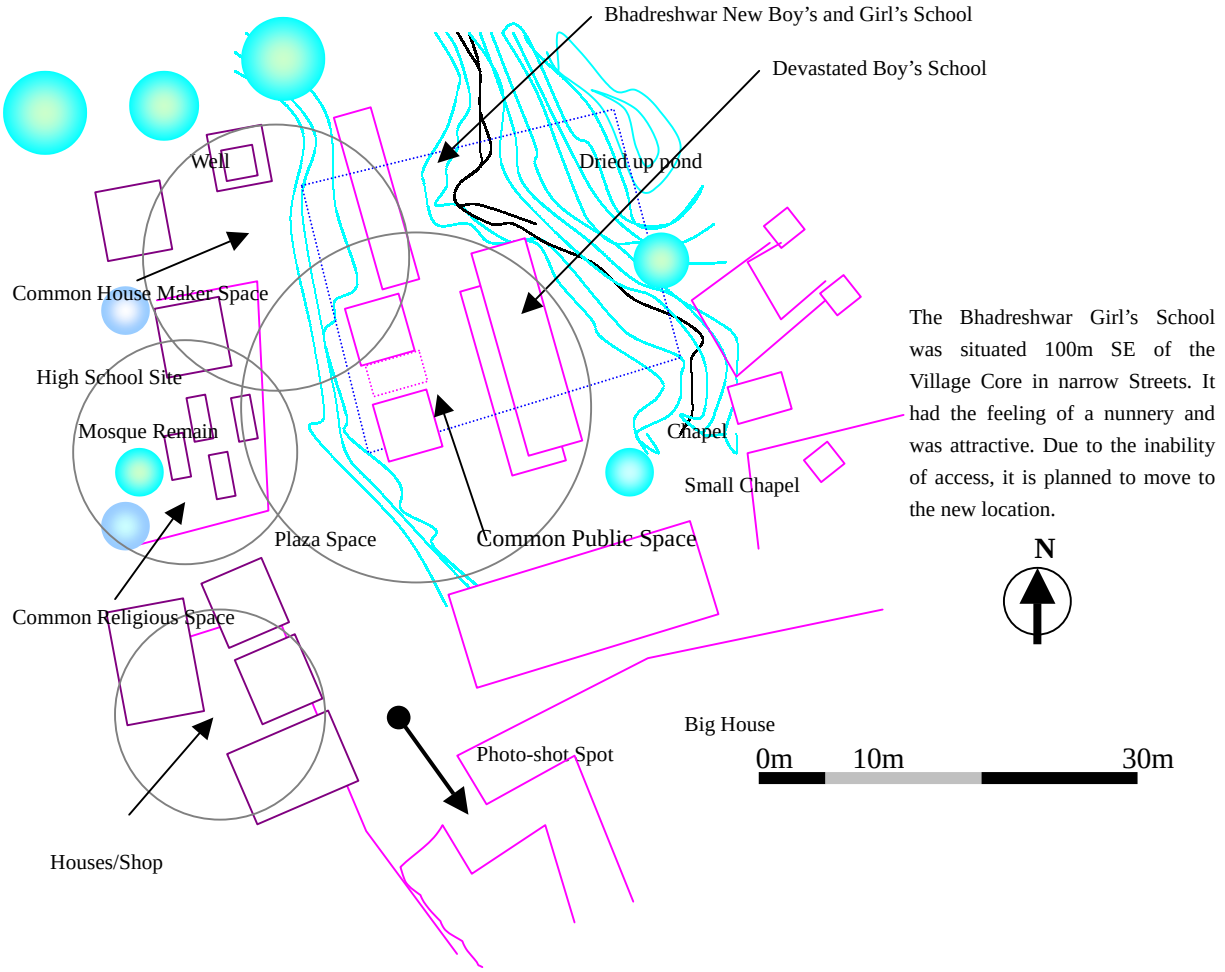


Fig.-4-4 Village Structure of Bhadreshwar Village in Mundra Taluka

Fig.-4-5 Image of Village Core

(6) Current Situation of the Reconstruction

General

While the GOG stated that the affected major social infrastructure will be reconstructed by the year 2003, because of the stagnation of economy, excessive damage, congestion of assistance of reconstruction aid organizations, shortage of human resources to cope with, etc., the State's restoration and reconstruction project is not smoothly proceeding as planned.

For the progress of the QRS project, it was hard to say that there was no negative influence of the above-mentioned matters, and therefore it was not an easy task for the Project Team to overcome such a situation.

Anyway, under the situation that the counterparts of the Project Team were very busy coping with the huge works for the reconstruction program, their effort to cooperate with the Project Team must have been in the ultimate limit condition.

The results of the study on the main points of the above-mentioned information are briefed below.

Reconstruction Budget Structure

Fig.-4-6 Budget Figures of Reconstruction indicates the analysis on the flow of budget/fund to see the correlation between the congested aids and the response of the State.
The values indicated in the Table are from a newspaper and slightly different from those in the other tables, and some of them are approximate figures.
However, the sum of restoration and reconstruction budgets seems to be converging to roughly 100 billion Ruppees or 2.2 billion US dollars.
The State budget for restoration and reconstruction in the year 2001 was 0.44 billion US dollars.
The fiscal year budget of the State is 7.928 billion US dollars.
Then, the restoration budget in the fiscal year is approximately 0.106 billion US dollars.
The insufficient balance of the fiscal year, 0.334 billion US dollars, is expected from the loans of the WB/ADB.
The amount of loans is also approximately 1.8 billion US dollars, which includes all the government subsidies.
Among the aids from other countries, the amount of 38 million US dollars (4.94 billion Yen) of the

Netherlands is large, but it is likely that the amount includes loan as well as grant.

The condition of the State finance appearing here is rather in more difficulties than what the GOG expressed, and it seems that increase of the gross State product and financial restoration by the increase of productivity are essential.

Therefore, the development of human resources through the expansion and improvement of the technical education is important.

Analysis of Assistance Pattern

The assistance patterns, which are correlated with the aid objects, are analyzed hereunder, while the horizontal distribution of the aid, i.e. the regional distribution structure, and the vertical distribution of the aid, i.e. the classified distribution structure, are analyzed separately in sub-clause 4.3 in detail.

Fig.-4-7 Assistance Pattern shows an outline of analysis of the assistance patterns.

According to a monograph by Mr. Matsunaga, the assistant of the Public Policy Research Institute of Osaka University, who accompanied the Bhuj investigation of the Project Team, the subject of the economic policy of the GOG is to eliminate the unbalanced condition caused by the natural disaster and to reinforce the infrastructure for self-development.

There are many emigrants and migrant workers from Kutch district and they are the ones actually supporting the district finance.

This is why many economic reconstruction aids are coming from Kutch people living abroad, and it is causing some chaos in the assistance pattern.

Moreover, it should be expressed that the cause of poor social infrastructure is from the constancy of poverty rather than the earthquake disaster.

This is why the people are not settling in Kutch, called a brain drain phenomenon, and the economic consistency keeps being depressed.

Therefore, it is highly desired that the quality of life to be improved by encouraging the higher education and technical education so that high level human resources will settle in.

The assistance patterns can be categorized into four as shown in Table 4-7.

Firstly, there is a “total village reconstruction support” pattern as in Hingaria village located 65km from Bhuj, famous as the seismic resistant village built by the Vibhas Trust and the Indian-American Foundation and a group of members of parliament.

The above pattern was applied to the whole village, i.e. 106 houses, school, children’s library,

children's park, hospital, etc.

It is reported that all the above-mentioned facilities were completed within 3 months and is an ideal pattern, though it has an inorganic/temporary impression probably because the assistance was carried out in such a short period.

Secondly, there is an assistance pattern to make a special objective disaster-village in one district as a 'City in the City', i.e. the total block reconstruction/relocation support.

The 'Children's Village' in Bhuj is an example of this pattern, and the India Children's Village in India (SOS) was in charge, with support from Mumbai Rotary Club.

The SOS has built the temporary children's villages in Bachau, Anjar and Rapar.

The SOS is also performing a village integration assistance for 500 people in Kunjisar village.

It is said that the SOS has a deep understanding of the caste matters.

Their assistance has a high success rate because it is well funded.

Thirdly, there is a "village multi-project mix support" pattern.

This is an assistance pattern where there are various aid organizations and NGOs to make various facilities of z village individually, and other organization control an overall village construction program including its own task of making the remaining facilities in the village.

This pattern tends to increase the level of facilities, while it needs coordination for overall development plan of the village.

The QRS project falls under this pattern.

Fourthly, there is a "urban facilities reconstruction support" pattern

This is a pattern of city re-development assistance like in the Bhuj case, and it has a time gap problem with the urgent assistance as the city planning takes time.

Finally, there is a "specified sector facilities all over the affected areas support" pattern.

This is an assistance for the regional adhered facilities of children welfare, education and healthcare in the whole affected area, e.g. the assistance by UNICEF, and is intensive assistance as it becomes a main stream of the overall earthquake disaster reconstruction program.

This is also to promote the reconstruction of the social welfare infrastructure of the whole affected area and has been proceeding for the humanitarian contribution from before the disaster.

Figuring out which is a better pattern is not the point, rather the significance is the fact that the rehabilitation and reconstruction activities for this natural desaster are being carried out with such various assistance patterns in complexity, which form the characteristics of the whole activities.

Thus, this whole rehabilitation and reconstruction activities can be considered as an extremely huge

social experiment, and it is thought that the implementation of this Project would produce a lot of valuable and useful information.

State Government Structure for Reconstruction Implementation

Fig. A-1 and A-2 in the Appendix show the outline of the State government organizations of education and healthcare sectors which were related to implementation of the QRS project. Fig.-4-8 shows the relationships of the said organizations from the planning stage up to the completion.

The QRS project implemented in this Project was an urgent and rapid construction project, therefore the system of this operation adopted a steering committee method which a key person of each organization of the GOG was appointed so that such person would be the central axis or core as a nodal point of decision making and intercommunication.

The key persons were the head of the primary education development for the primary education sector, the facility construction director for the healthcare and the secretary of the financial department (the highest position of government organization) who was appointed as signer to the M/M of the Project.

The directors actively managed the practical matters, and they were the ones who became the core where the directive, confirmation and approvals were conducted from up to the levels of local administration, organization of counter-disaster measures and village, according to the procedure flow of a-b-c-a as shown in the Fig.-4-8.

However, the original village assistance procedure of the circulatory arrow flow, A-B-C-A as described in thick lines in the Fig.-4-8, indicates a desirable procedur to be followed.

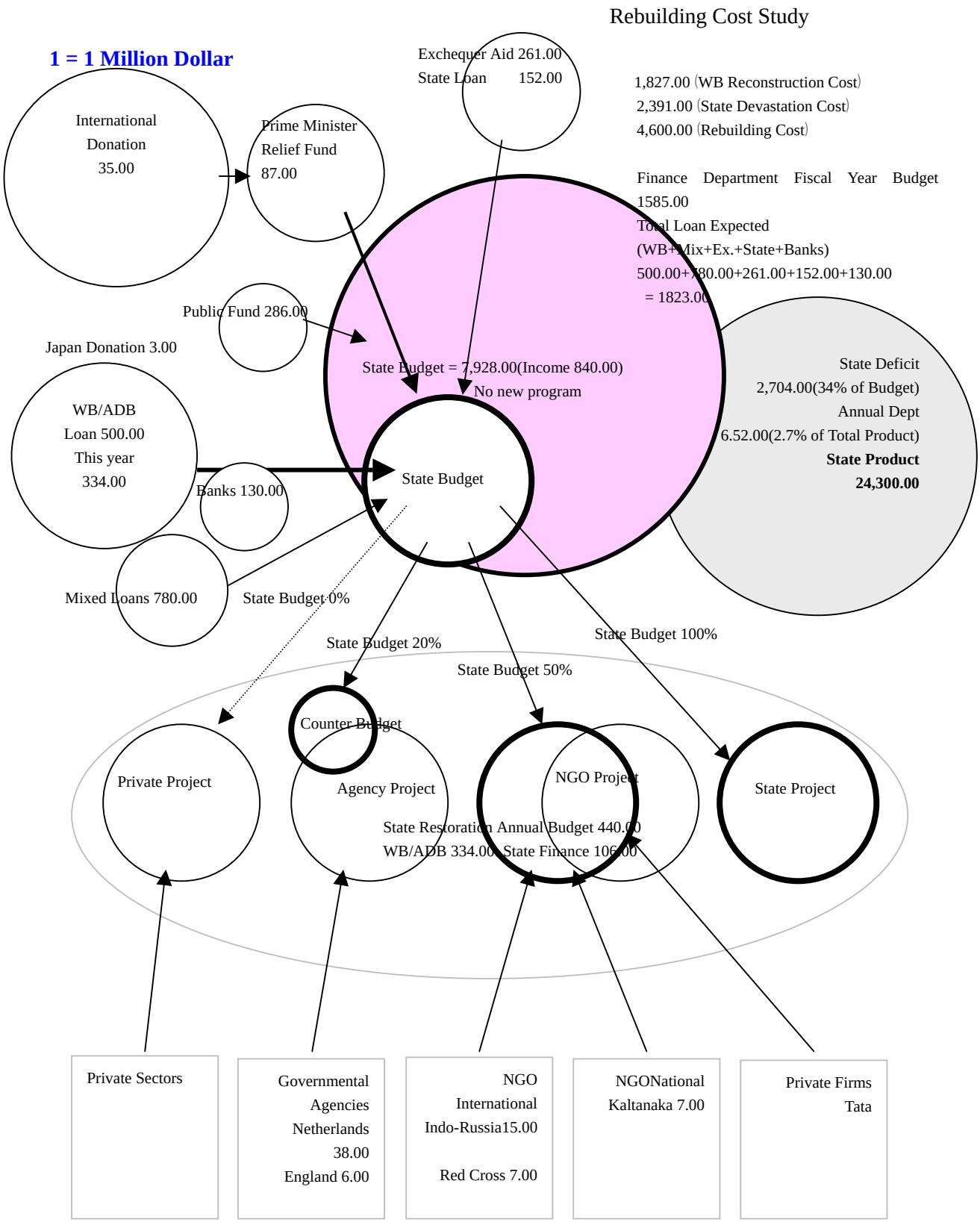


Fig.-4-6 Budgetary Figures of Reconstruction

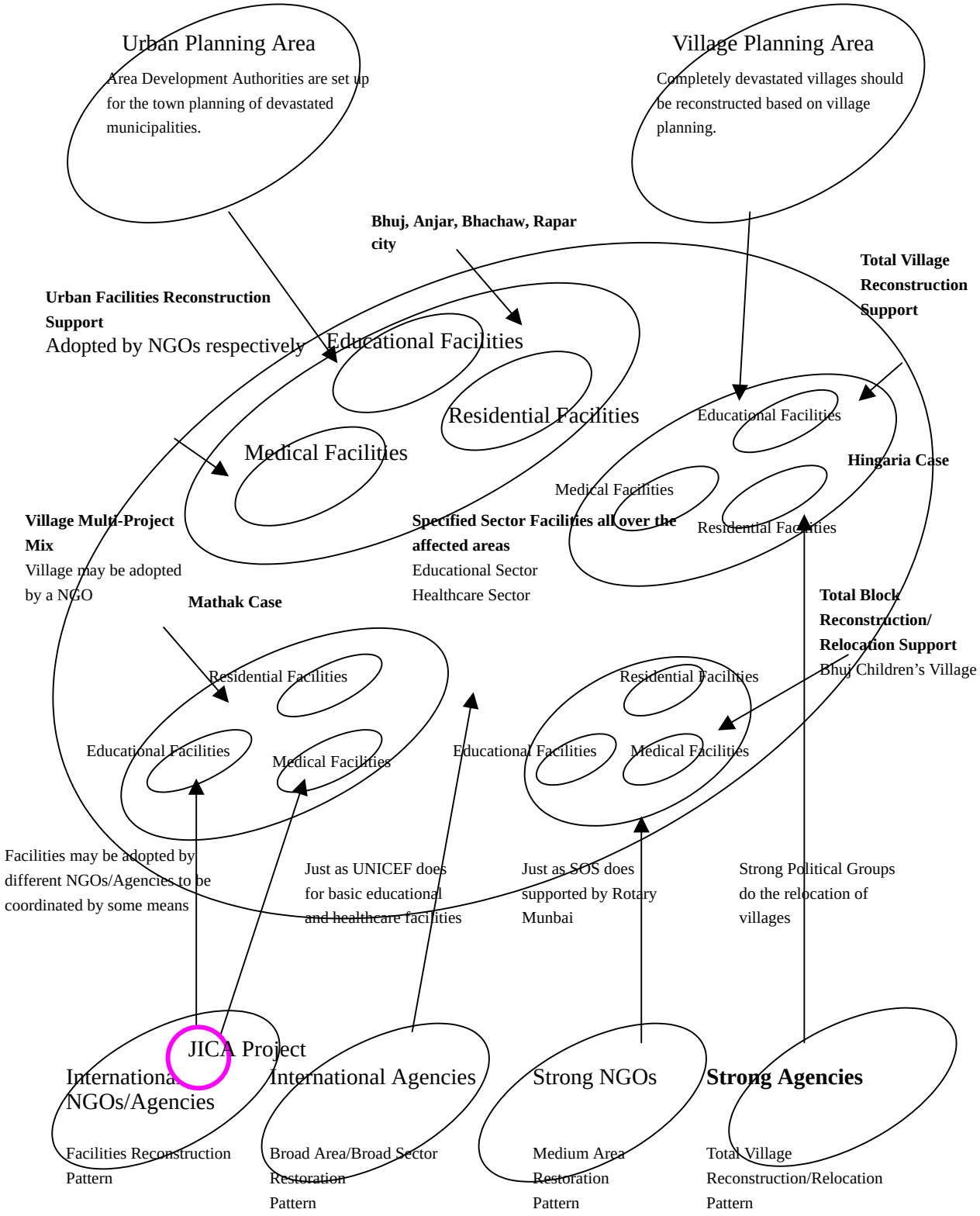


Fig.-4-7 Assistance Pattern

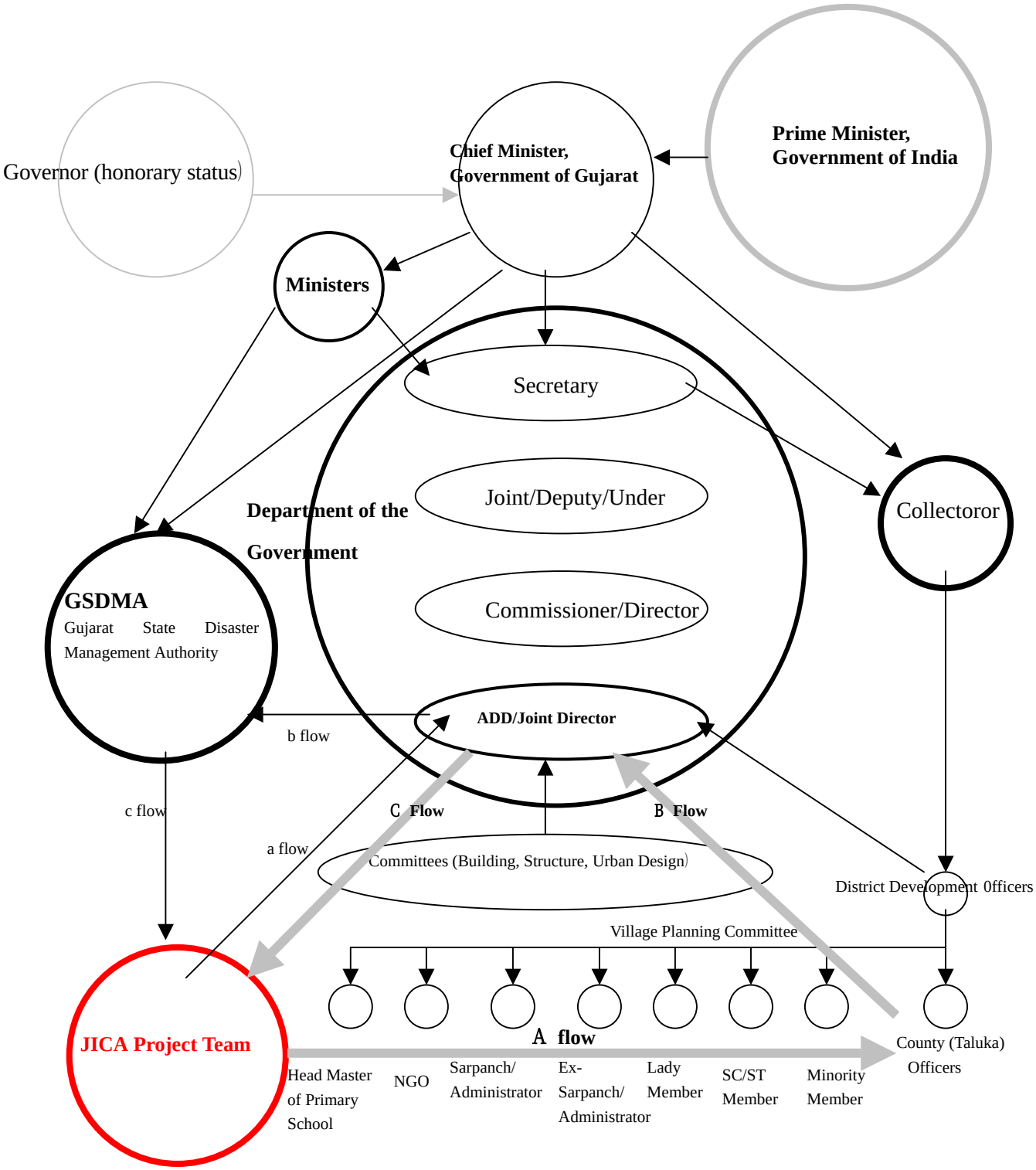


Fig.-4-8 Government Reconstruction Management System

Actual Situation, Inefficiency and Confusion

The chaotic conditions cannot be accepted by the desperate victims, and it should be improved by the nation, State and people themselves earnestly.

However, the slightly confused inefficiency could be a kind of protection or absorption, for the total reconstruction of the whole district in unimaginable scale, as it were, a huge social experiment, it could be considered that such conditions are not always a negative given factors.

It can work to draw the people's participatory attitude for the future, and even though it takes time, there will be a possibility that the village and city without estrangement from their cultural anthropological deep-subliminal structure, will be built in the place of no sense of alienation there.

Such kind of insolence that the donor has an authority to decide the future should not be accepted.

4.2 Projects and/or Programmes of other Donors and/or Agencies

The rehabilitation and reconstruction programmes of social infrastructure of the devastated areas have been carried out mainly by the GOG/GOI so far. Many other international and national/State agencies, NGOs etc. have been supporting/assisting the procedure in many sectors including primary education and basic healthcare described in the following sections.

Firstly, one important thing to be pointed out is that the pre-earthquake activities of those supporting/ assisting agencies are substantially evaluated to be a key factor of their successful post-earthquake performances as the continuation of their activities.

World Bank and Asian Development Bank have already been committed to the development of the State. UNICEF also has been energetically carring out its “Rights of the Child” program all around India.

Many successful NGOs are well experienced in activities in and around the Kutch district and of rehabilitation programmes for the areas of castes and tribes.

Secondly, the importance of the function of the core organization for the relief programmes is to be pointed out. GSDMA was established for this, but not yet so strong as to be the actual core of these complicated procedures.

One more thing to be pointed out is an efficiency of the grass-root-type participatory methodology of the rebuilding programmes together with NGOs through GSDMA.

(1) NGO Adopted Villages

The list of Villages adopted by NGOs in Kutch district and other districts are as in the Table-A-3 and Table-A-4 in the Appendix.

Table-A-5 is a List of NGOs in India. Many NGOs in India are working now in the devastated areas to reconstruct and relocate the villages affected in accordance with the Village Partnership Procedure Manual set by GSDMA.

(2) GSDMA as Nodal Organization

The organization structure of GSDMA is shown in the figure below:

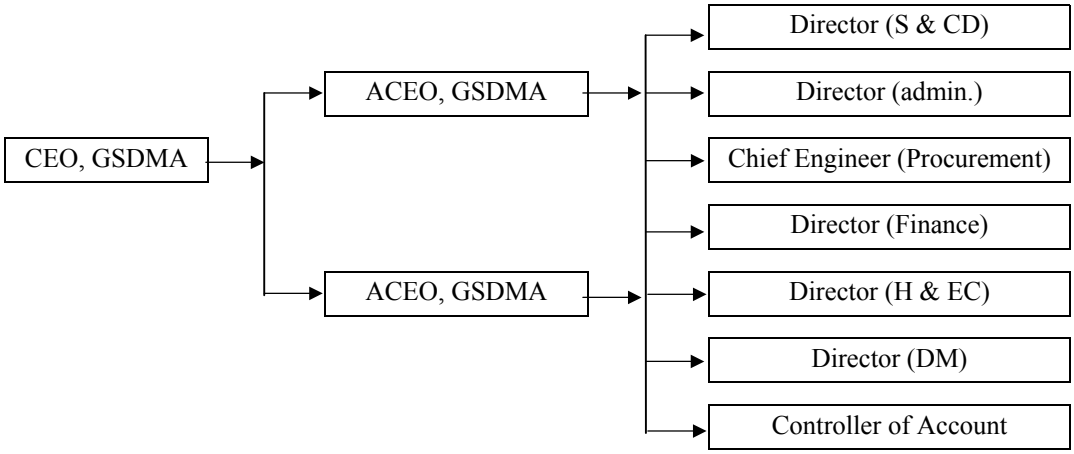


Fig.-4-9 Organization Structure of GSDMA

The reconstruction programmes of villages are typically set up by GDMA as follows:

OVERVIEW OF THE PROCEDURE FOR VILLAGE PARTNERSHIP

Corporate/NGO makes initial application (a letter) for village partnership to NGO Cell at GIIC Office, Gandhinagar	
↓	
Corporate/NGO does initial survey of the village(s)to be partnered with. (In-depth survey can be done by an NGO with the Govt.)	
↓	
Send Prescribed Form for partnership to NGO Cell, District Collector、Taluka Mamlatar of the villages	NGO Cell is in GSDMA.
↓	
In-principle approval obtained from GSDMA within 5 days of request made	GSDMA; Gujarat State Disaster Management Authority
↓	
Within 15 days, Gram Sabha needs to endorse the partnership, Their approval is a requisite.	Gram Sabha is an informal body consisting of all villages.
↓	
A detailed project report with cost estimations is submitted to the ADDI.DDO (for worst affected taluka)/DDO (for other affected areas)	
↓	
Based on the report final approval decision taken by the executive committee (ADDI. Collector + Exec .Engineer for worst affected tulkas、Collector + DDO + Executive Engineer for other villages)	
A separate bank account is opened. Initial 20% deposited (of each partner's share in project cost) The Corporate/NGO begins with the Groundwork along with Gram Navratina Samiti(GNS).Total 50%.	GNS is a committee consisting of important local people.

GRAM NABRATINA SAMITI-GNS STRUCTURE Dy=Deputy
Chairman ; Dy. Collector/Mamlatdar/Talka Development Officer/Dy. TDO
Member ; Sarpanch or Administrator, Ex-Sarpanch, Lady member, SC/ST member, Member from minority committee, if any. Head Master of Primary School, Representative of NGO and Member Secretary.

Fig.-4-10 Village Partnership Procedure Manual

(3) Present Situation of other Donors/Agencies

Overall Situation

From the World Bank Report (one year after the Gujarat Earthquake), up to 18 months after the earthquake struck, the regional restoration of the basic social infrastructure, including primary educational facilities, requires a 400 million US dollar Phase 1 short term operation loan, and this assistance is progressing well. At the same time, for up to 3 years after the disaster struck, for public facilities, public enterprises and countermeasures against natural disaster, a 400 –500 million US dollar Phase 2 medium operation loan is already in progress. Furthermore, for up to 5 years after the earthquake hit, a further 100 – 150 million US dollars Phase 2 long term operation has started, for preparation work on the earthquake damaged social environment, disaster relief for the regions organizational structures and also for preparations for earthquake insurance guarantees etc. Before the earthquake, the United Nations, WB, ADB and other international organizations had been working on of the social environment and providing development assistance in India. These are also the main initiative assistance promoting organizations for the earthquake disaster recovery. For other donors/agencies, the effectiveness of the assistance application regarding the contents, scale and determining of the support, are up to where they stand.

An overview of overall figures of the support assistance from each country and each domestic organization one year after the disaster is described below.

International Organizations

The UN, in particular, UNICEF has been providing continuous development assistance for children's education and healthcare since before the earthquake, and this has been a vital activity. UNDP have also been providing voluntary social environment restoration preparation work. The WB has had a deep relationship with India since before the earthquake and the India Gujarat Earthquake Recovery Program Assessment Report issued jointly with ADB on 14 March 2001 was a complete and detailed study and provided the basis for the earthquake restoration work.

According to UNDP, assistance agencies and NGOs divided the fields of their assistances for rehabilitation/reconstruction work as shown below (as of August 2001)

Education	UNICEF	**Legal**	SLIC
Health	WHO	**Water and Sanitation**	OXFAM
Livelihood	FICCI-CARE	**Food and Nutrition**	World Food Program
Shelter	CARTAS India	**Child Protection and disaffections**	Save the Children
Watershed	VRTI		

Of supports from other countries, assistance from the Netherlands is large. The Netherlands has been continuously assisting the primary education sector from before the earthquake.

With the progress of the decentralization of India, administrative independence of the State governments has increased and the GOG has been the principal body for the earthquake damage recovery. The support organizations of the GOI, other countries, and other State governments are all shown together in Table 4-11. In addition, assistances of NGOs have played important roles in attaining results and assisting in the social development organization work.

Japanese Assistance

The initial assistances made to the disaster area were dispatch of medical teams, provision of relief supplies and delivery of a large amount of additional relief supplies.

Appraisal of overall Funding

Analysing Table-4-1, the total loans amount to 1,430 million US dollars, the non-tied donations to 390 million US dollars, making an overall total of 1,820 million US dollars. The World Bank evaluation shows that out of the restoration budget, various expenses amount to 180 million US dollars, rebuilding costs to 1,820 million US dollars, making a total of 2,000 million dollars. It would appear that 90% of the funds required for the Gujarat Earthquake recovery damage have been obtained, but the reality is that the loans are still only proposed future loans, and that for non-tied donations, the expression used is often just a favourable expression. It has also been established that the actual rebuilding cost will be double (or approx. 600 billion Japanese yen), as the actual declared funds amount to only 45% of this total.

From the World Bank evaluation of 1,820 million dollars for the rebuilding cost, 1,100 million dollars of this, or around 64%, is set for the housing rebuilding cost., and for the earthquake recovery, the village rebuilding is an urgent important item. Due to this, however, other parts of the regional social infrastructure facilities such as the education and healthcare sectors are being delayed. As this Project started a little after the support activities started, this was perhaps one of the reasons that Project was able to obtain firm results in a short time. The current situation of the support for each of

the educational, healthcare and technical educational sectors are shown below.

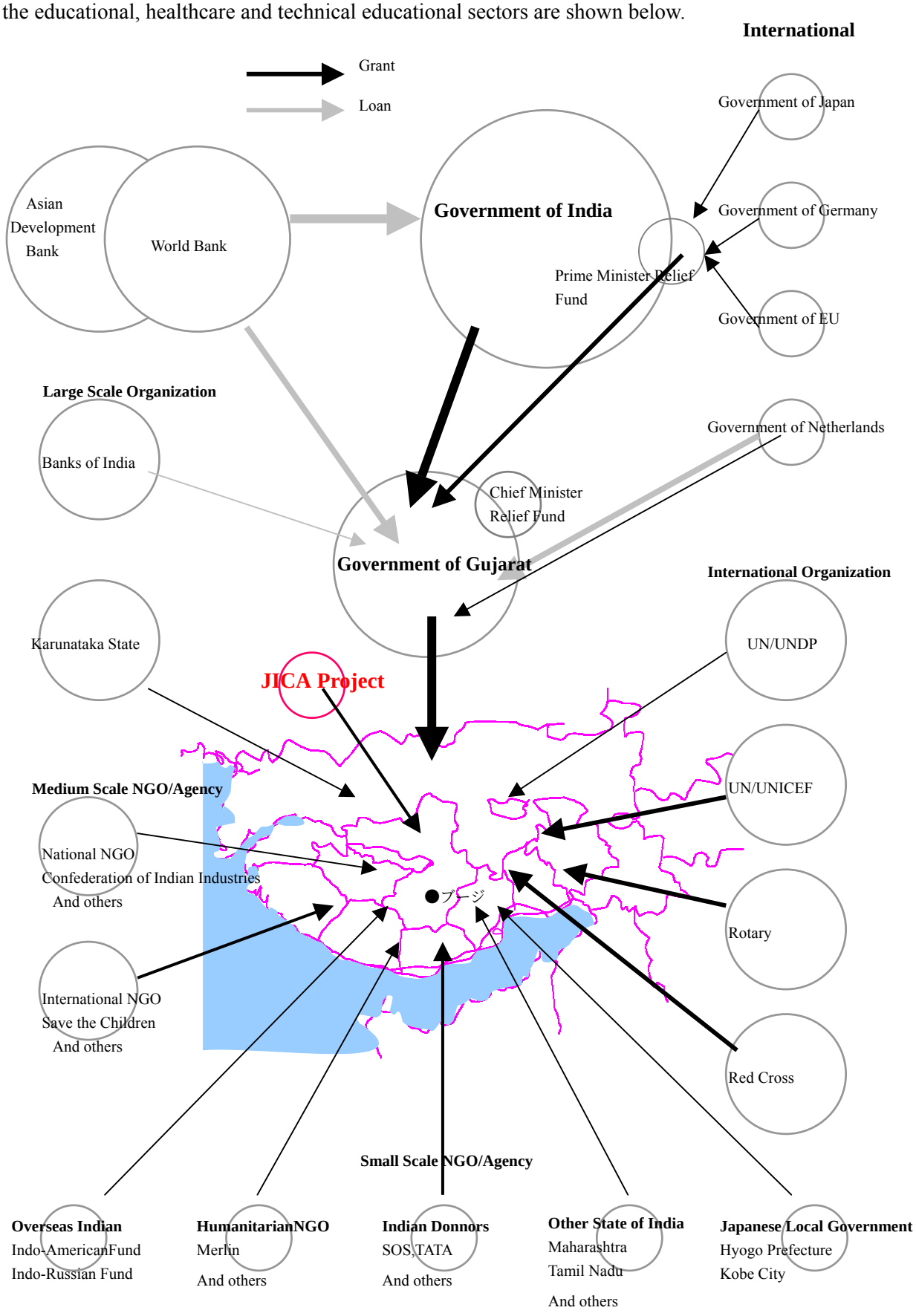


Fig.-4-11 NGOs/Agencies for All Sectors

Table-4-1 Projects and/or Programmes of other Donors and/or Agencies For All Sectors and District -Based on the report of Directorate of Information of the GOG

Donors/Agencies	Project/Programmes	Notes
The United Nations Based on Gujarat earthquake 2001 published at 2001/04 by UNICEF/UN	UNICEF 1st Request for Urgent Support (in a month) 2nd Request for Medium Term in 2001 long Term in 2002	 $ 12.8 million $ 16.0 million $ 1.5 million
World Bank Based on the India Gujarat Earthquake Recovery Program Assessment Report Published at 2001/03/14 by WB/ADB	Assessment Report 01/03/14 Phase 1 Urgent Short Term Assistance Loans Phase 2 Reconstruction Medium Term Loans Phase 3 Institutionalization Long Term Loans Hazard Mitigation Community Knowledge Management Risk Transfer	 $ 400 million $ 400-450 million $ 100-120 million ($ 40-50 million) ($ 15-20 million) ($ 40-60 million)
Asian Development Bank	Assessment Report 01/03/14 with WB 80% of $ 625m Recover cost = $500m Loan	 $ 500.0 million
International Assistance Germany/Japan/EU NRI & NRG UK Germany France New Zealand Government And many others	 Direct ssistance Direct assistance With 60 member team and items, 1200 tents With 30 member team and items With 44 Doctors, relief team, dogs With other materials	 $ 35.0 Million $ 2.8million $ 6.3 million $ 0.5 million $ 0.1 million $ 0.5 million
National Assistance Central Government Prime/Chief Minister's Fund And many others	 Allocation for relief Contribution and 5000 Angawadis Aid for rehabilitation State Bank of India Central Bank of India and employees VSNL MTNL Renbaxy Laboratory Railway Employees Indian Oil Corp Socialist Party	 $ 113.0 million $ 108.7 million $ 112.4 million $ 0.4 million $ 0.5 million $ 2.2 million $ 2.6 million $ 2.2 million $ 3.3 million $ 1.6 million $ 0.8 million

Total loan $ 1,430.3 million, total grant/support $ 392.9 million; grand total $ 1,823.2.

Support Situation in the Primary Educational Sector

As mentioned before, the rebuilding of the villages is the most urgent item, and this is the starting point of the earthquake disaster restoration. The method for the rebuilding of the villages is shown in Fig 4-10. The GOG seeks the participation of NGOs, and then together with a joint village group representative, the village chief (Sarpanch), former village chief (Ex-Sarpanch), women, distinct caste groups, small tribal groups, the primary school headmaster, and an NGO representative, with meetings chaired by the representative from the GOG, the GSDMA approves the progress. The rebuilding of the villages, and whether it will include the primary education facilities, is not always clear, and this became sometimes an obstacle for this Project. In addition, when it was fixed, with the share of

covering the costs shared 50-50% between the NGO and the State Government, even where the conditions for the assistance activities of the NGO are simple, if the work planning capability of the NGO is insufficient, the restoration is delayed, making it almost impossible to do the work, creating another hindrance factor.

Making friendly space for children

For the support organization for earthquake recovery of the primary education facilities, the United Nations also selected UNICEF. This was presented in the details of the Second Assistance Request presented by UNICEF - New Delhi in April 2001, titled 'Gujarat Earthquake 2001: India (April 2001 – December 2001)'. The First Request for the sector of Primary Education was for 27 million dollars, and the second for 57 million dollars. The object was for tents, toilet units, water supply tanks, study kits etc. It did not include any costs for the construction of facilities. Also, the building of 189 primary education facilities with 600 classrooms was planned, and 152 schools and 719 classrooms already being put into work. Of these, 52 schools were already under construction. This was part of the UNICEF project for Creating Child Friendly Spaces, and the work for this project started quickly and progressed on a voluntary basis.

Of international support, the second main support for primary education was the Netherlands government's assistance. This social development support started before the earthquake struck, and was related to assistance contribution for primary education. According to the Embassy of Japan in India's home page (9 February 2002), after Japan and the UK, the assistance from the Netherlands ranked No. 4 towards India, with a total of 50 million dollars. Japan was the highest donor providing 579 million dollars.

Table-4-2 Projects and/or Programmes of other Donors and/or Agencies for Primary Education Sector in Kutch District -Based on GSDMA web 02/02/12-

Donors/Agencies	Project/Programmes	Notes
United Nations (UNICEF) Creating child friendly Spaces United Nations Development Programme (UNDP)	1st Request Equipment/others 2nd Request Water Tank/others (Plan for all) 189 prefabricated and electrified primary schools with 600 classrooms with school kits and teachers kits and sanitation units Provision of over 2,000 sanitation units for schools and Angawadi centers Health and education Forma (HEIMS) Reconstruction Support	$ 2.7 million $ 5.7 million (Data for Kutch) 152 schools(719 classrooms), 52 under construction
World Bank (WB)	Loans to GOG Damage estimation $ 307.0 million	
Asian Development Bank (ADB)	Loans to GOG Together with WB	
Government of Netherland	Grant and loans Already received $ 12.8 million as grant	$ 37.6 million $ 5.7 million
International NGOs 1.Rotary 2.Karnataka and Russia 3.Save the Children	 1. 179 schools (1,093 classes) 2. 408 schools (2,281classes) 3. 8 schools (109classes) Adipur 42 class	 Adopted. All district Reserved. All district Adopted. Bhachau based
National NGOs 1. Confederation of Indian Industries 2. State Government of Karnatak 3. TATA Relief Committee 4. Members of Parliament 5. FICCI-CARE 6. India Net Foundation 7. AMUL(GCMMF LTD) 8. Bhart Scout & Guid 9. World Vision 10. Vivekanand R&T Institute 11. Other NGOs 12. Not adopted	 1. Schools (107 classes), 11 started 2. 37 schools (292 classrooms) 3. 18 schools (108 classrooms) 4. 49 schools (459 classrooms) 5. 30 schools (203 classrooms) 6. 12 schools (58 classrooms) 7. 26 schools (173 classrooms) 8. 7 schools (40 classrooms) 9. 9 schools (60 classrooms) 10. 11 schools (65 classrooms) 11. 127 schools (786 classrooms) 12. 28 schools (129 classrooms)	 1. No details. All district 2. Reserved. All district 3. Reserved. All district 4. Reserved. All district 5. Reserved. All district 6. Reserved. Anjar Taluka 7. Reserved. Mandvi Taluka 8. Reserved. Rapar Taluka 9. Reserved.Rapar based 10. Reserved. Abdasa base 11. Reserved. All District 12. Site problems
GOG (DPEP)	104 schools (707classrooms)	Adopted
GOI	5 schools (35classrooms)	Under construction
DPEP; District Primary Education Programme		

Number of schools reserved for reconstruction and repair listed up in the Table-4-2 is 1,234 with 7,424 classrooms.

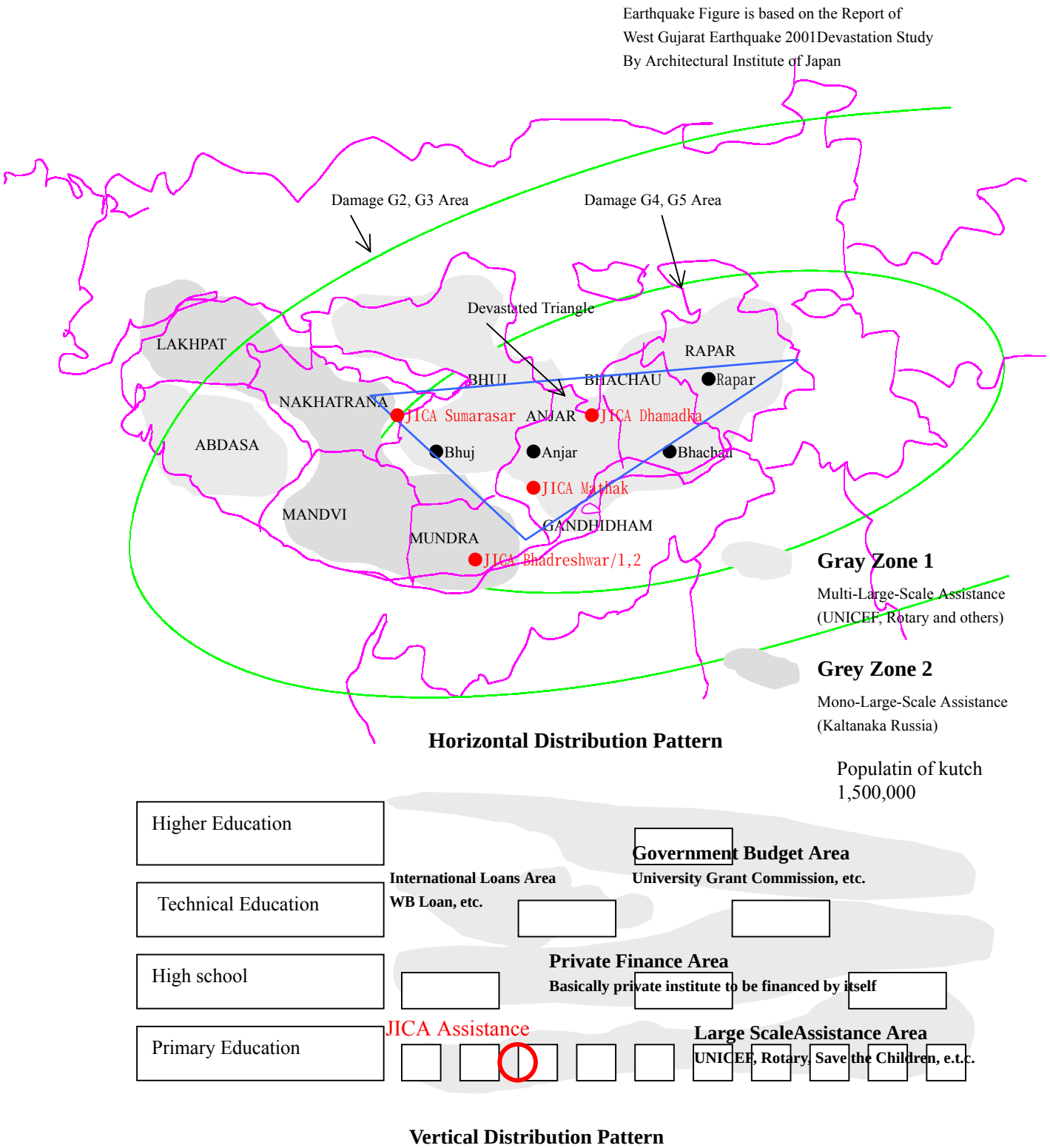


Fig.-4-12 NGOs/Agencies' Activities of the Primary Education Sector in Kutch District

Horizontal Distribution Pattern of Assistance

The epicentre of the earthquake occurred in the Eastern part of Kutch district, 10km North of Bachau, extending over an oval shaped area, tilted slightly upwards to the right,. The main area of damage was very large, and extended over a range extending 400 km by 300km, including at the extremities the State capital Gandhinagar and also the nearby largest city of Ahmedabad. The area of assistance distribution also followed this tilted oval shape, and in particular the worst area of damage extended over an area 300km long by 200km wide. In the SE corner of this area, the number of homes is small, as this is the semi-desert region of the Little Rann, and the number of collapsed houses was also few. The main damage occurred further to the West, near the towns of Bhuj, Anjar and Rapahr, and Bachau is situated in the centre of an inverted triangle in this region, and most of the severest earthquake damage was concentrated in this triangle.

Competition Phenomenon of Assistance

UNICEF, Rotary and Karnakata-Russia were large-scale providers of assistance, and provided support over practically the whole affected region. The assistance of Karnakata was mainly concentrated in the area of Nakhatrana, Lakhpad, Mandvi and Mundra. UNICEF concentrated in the destroyed town of Bachau. Domestic NGOs provided medium scale assistance to over 18 schools over the whole region, while AMUL only focused on the Mandvi sub-district. Smaller scale assistance appeared to concentrate in special regions. Within the triangle, some competition developed in the surroundings of each respective town area, and for the Projects of the Members of Parliament in particular, the order of priority for their selection of chosen projects was high, and for the Project some adjustment had to be made to suit this.

Vertical distribution Pattern of Assistance

The vertical distribution refers to the hierarchical structure of educational organizations and their relation to the assistance provided, and there is a layered structure to the schooling based on age. The United Nations placed emphasis on children's welfare, and UNICEF provided large-scale work on the primary educational facilities, and the Rotary, Save The Children and Karmakate-Russia also added to this. At the high school level there were many Grant-in-aid projects, and with the State government bearing the costs of teachers fees only, this type of assistance was not fit to the government issue. At the technical education level, the State government managed affairs, and were originally hoping for

some World Bank loans. At the higher education level, the numbers affected were not so large, and government related funds provided some support.

The significance of this support in the Vertical/Horizontal Structure of Assistance

According to recent public announcements made by the GOG, most of the damage is concentrated in Kutch district, and although some other regions were also severely damaged by the earthquake, recovery work is generally progressing reasonably well. For the objective application of this Project, the 5 primary educational facilities were all concentrated in the triangle zone in Kutch district bounded by Bhuj, Anjar and Mandvi, and this it can be said that the assistance as decided for the Japanese assistance is apt, and the design supervision work also was efficient.

According to announced Gujarat State data, of the support provided for primary educational facilities, 100% support would involve 43 NGOs and 1,803 classrooms, and 50% support 25 NGOs with 4,676 classrooms. Actually, 100% of this assistance would apply to only 28% of the total damaged classrooms. Gujart State can maybe pay 36% of the budget for rebuilding the classrooms.

Situation of Assistance for the Higher Technical Education Sector

General outline of damage

All the facilities of the technical education sector of Kutch district in Gujarat District collapsed from the seismic damage, and the students have since had to use either temporary facilities or use other facilities in relatively near districts. Kutch district has plans to erect 42 temporary Geodesic domes as temporary facilities. Another 20 prefabricated facilities are needed, and as the government will be providing funds for this, it is probable it will be realized.

Movements of the Technological Education Sector

The Technological Education Directorate has prepared measures to implement rebuilding plans to repair the damage from the earthquake, amounting to a total budget of 21.7 million US dollars, and has made loan requests to the World Bank. However, the World Bank has difficulties in arranging these funds, and the suggested contents of the Technological Education Directorate are not just to restore to the original status, but to rebuild and expand the facilities, and as this doesn't fit the financing standards, the request has not been responded to, and so studies are ongoing. In addition, in the World Bank itself, there are shifts to change assistance to developing countries from loans to grants,

and there are reports that the earthquake damage restoration assistance to India may be re-examined.

Contents of Assistance

According to the World Bank Report, the total budget amount for rebuilding the technical education facilities, and for improving their earthquake resistance, for the whole of Gujarat, would amount to 58 facilities, and a rebuilding budget of 22 million dollars. As shown in Table 4-5, the rebuilding budget for the technical education in Kutch district is 21.8 million dollars, which is almost the same as the above figure. The scope of application would be for Engineering College, Bhuj; Polytechnic, Bhuj; Vocational Training Centre, Bhuj; Pharmacy College, Lakhtar is in the Sarenranaghar District, south east of Kutch district. In addition, as a new application, an Institute of Seismology is also planned, but this would be as a part of the Engineering College Bhuj, and in the report it is proposed that this could be as a university graduate school, Institute of Technology, Bhuj. Dr. Ariya, a leader in seismic-resistant structures, is planning a building material test centre in the Campus of Engineering College, and he also has plans for an earthquake research centre.

Table-4-3 Projects and/or Programmes of other Donors and/or Agencies for Technical Education Sector -Based on the GOG proposals-

Donors/Agencies	Project/Programmes	Notes
The United Nations	No programmes	
World Bank/ADB Request from GOG	1. Engineering College $9.5m 2. Polytechnic $3.3m 3. Vocational Training $0.4m 4. Pharmacy College $0.5m 5. Repairs $1.1m 6. Equipment $5.2m 7. Design $1.1m 8. Training $0.7m Total $21.8m	Not fixed yet WB/ADB is reducing loans to GOG. WB strategy is changing loans to grant. WB does not allot loans to advanced technical education but only to restorations.
International NGOs	No programmes yet	
National NGOs	No programmes yet	
GOG action	1. Data collection 2. Proposal for funding 3. Rehabilitation activities 4. Academic activities 5. Transferring affected student 6. Examination date changing 7. Request to WB; $21.8m	Urgent repair Intermediate shelters; 42 Geodesic Domes to be build as temporary campus facilities designed by a German architect in Bhuj technical education institutes.
m; million		

Multi-National Support

At the moment, in this sector, although there is no competition for assistance, for the sector of higher technical education, while single country assistance could apply to the actual facilities, for teaching and education contents, it is thought that it would be better if there was assistance support from other

countries. It is hoped that for technical cooperation, that effective assistance from numerous countries can be obtained. Although Japanese assistance could possibly cover the facilities and equipment materials, it is thought that the partner country would welcome the format of multi-country cooperation on activities of research and education in the facilities.

Position of Institute of Seismology, Bhuj

As already mentioned, the Institute of Seismology will be a part of the Expansion and Maintenance Concept for Bhuj Institute of Technology (Up-leveled Engineering College, Bhuj) and could possibly become more a decentralized core rather than the center of the country, i.e. a part of the Central Seismology Research Institute Concept as maybe planned in Delhi together with Gandhinagar decentralized core.

Natural Disaster Central Synthetic Institute

First of all, there is certain movement on this matter nationwide.

The possibility of the Japan – India Collaboration Project in the field of earthquake and related technology has been proceeding to a certain degree by exchanging the opinions with Dr. Alia who is the authority of the seismic resistance technology in India and also the examiner of the structural plans of the Education and Healthcare Facilities in Gujarat State.

How it will be substantiated practically is dependent on the process in future, but it will possibly be the Natural Disaster Central Synthetic Institute to be placed in Delhi University in the capital.

In this institute, the department to study for the earthquake and social measures, namely a synthetic science will be established.

For the seismological technology or seismic resistance technology, the Seismological Technology Central Institute will possibly be centralized and established at the core probably at the India Institute of Technology of Mumbai.

Gujarat State Disaster Management Authority (GSDMA)

Secondary, there is a movement of the GSDMA.

According to what the think-tank of Anderson Co. Ltd. said regarding the future of the GSDMA which is acting as a coordination body of the restoration aid for Gujarat earthquake, GSDMA should be the implementation or execution body for the natural disaster restoration/reconstruction program and there will be some way to be, like a department of disaster or think-tank.

As it is shown in the Fig.-4-26, upon participation of the Minister of International Trade and Industry, there is a concept of the National Disaster Control Center of which GSDMA will be a core.

This concept is made in cooperation with the California Disaster Management Center of California University and this concept together with the other concept, the Disaster Expert Training Program, are agreed by Mr. Edward Rise, a State legislator of California and other leading figures of that State.

A few specialists have already been invited to the training at the said university in June, 2001.

The location of these central facilities has not been decided, but it is said that Gandhinagar city where the State government exists, is the most probable location.

Institute of Seismology, Bhuj

Moreover, there is an aid proposal from the technical education bureau of the high education agency of the department of education of Gujarat State.

According to that proposal, the Institute of Seismology, Bhuj is, as a graduate school, to be built in the campus adjacent to Gujarat Institute of Technology.

The concept of such an institute is that, in the ultimate plan of the year 2006, it will be an institution of higher education research, which can accommodate 74 school staff and 140 students.

Because there is still no earthquake research institute in India, to establish the “Center of Excellence” in cooperation with universities and institutes in India, this has a great meaning.

Meeting Point to Japan

Japan, as a country having suffered from earthquakes, took a deep compassion for the earthquake disaster of India and also, taking it as an objective of seismological research, sent an investigation team under the name of “Synthetic Research for Great Western India Earthquake Disaster in 2001” raised by the Ministry of Education.

Two other teams of the civil and architectural fields accompanied this research team.

The Kobe city of Hyogo Prefecture also sent an investigation team for the earthquake disaster restoration aid and is performing the aid activity with the contribution of money, and the brief of such is shown in Fig. 4-26.

Furthermore, the names of earthquake research organizations in Japan are also listed, however it does not mean that these organizations have already committed themselves but are being indicated solely as information to consider the way of the seismological research in India.

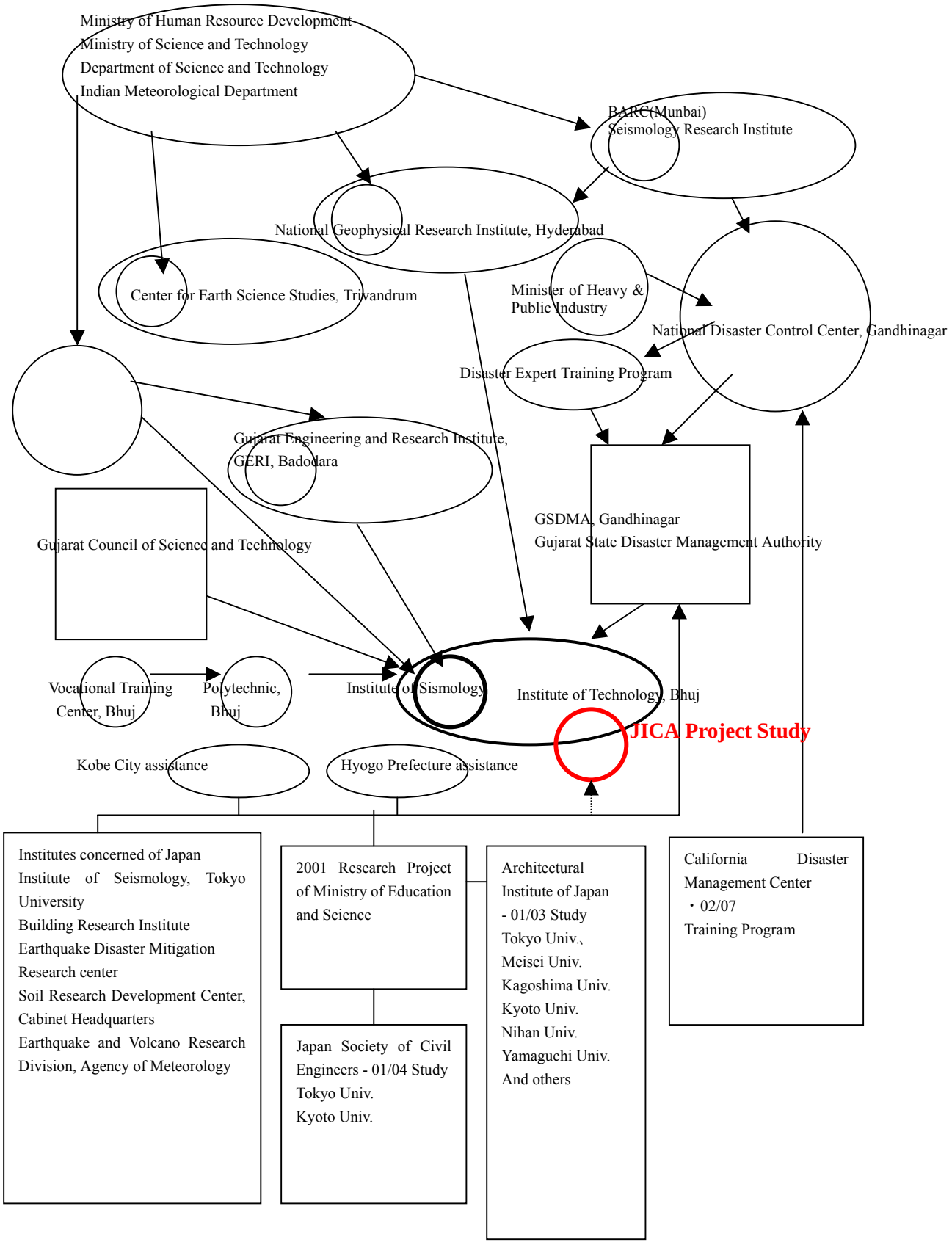


Fig.-4-13 Possible Institute of Seismology

Remarks

Fig. 4-13 of the Seismology Research Institutes indicates, as an assumption or suggestion, the structure of the seismology research institutes of India overall.

It is said that a Great Himalayan Earthquake will occur in the future in India, which might incur some hundreds of casualties due to the accumulated energy produced by the movement of the India-Himalayan Plate (by joint study of Colorado University and Bangalore University).

As there will be another possible earthquake in the Kutch area, the development of the Earthquake Disaster Prevention Research, Synthetic Seismology Research and Seismological Technology Research, are said to be urgent subjects

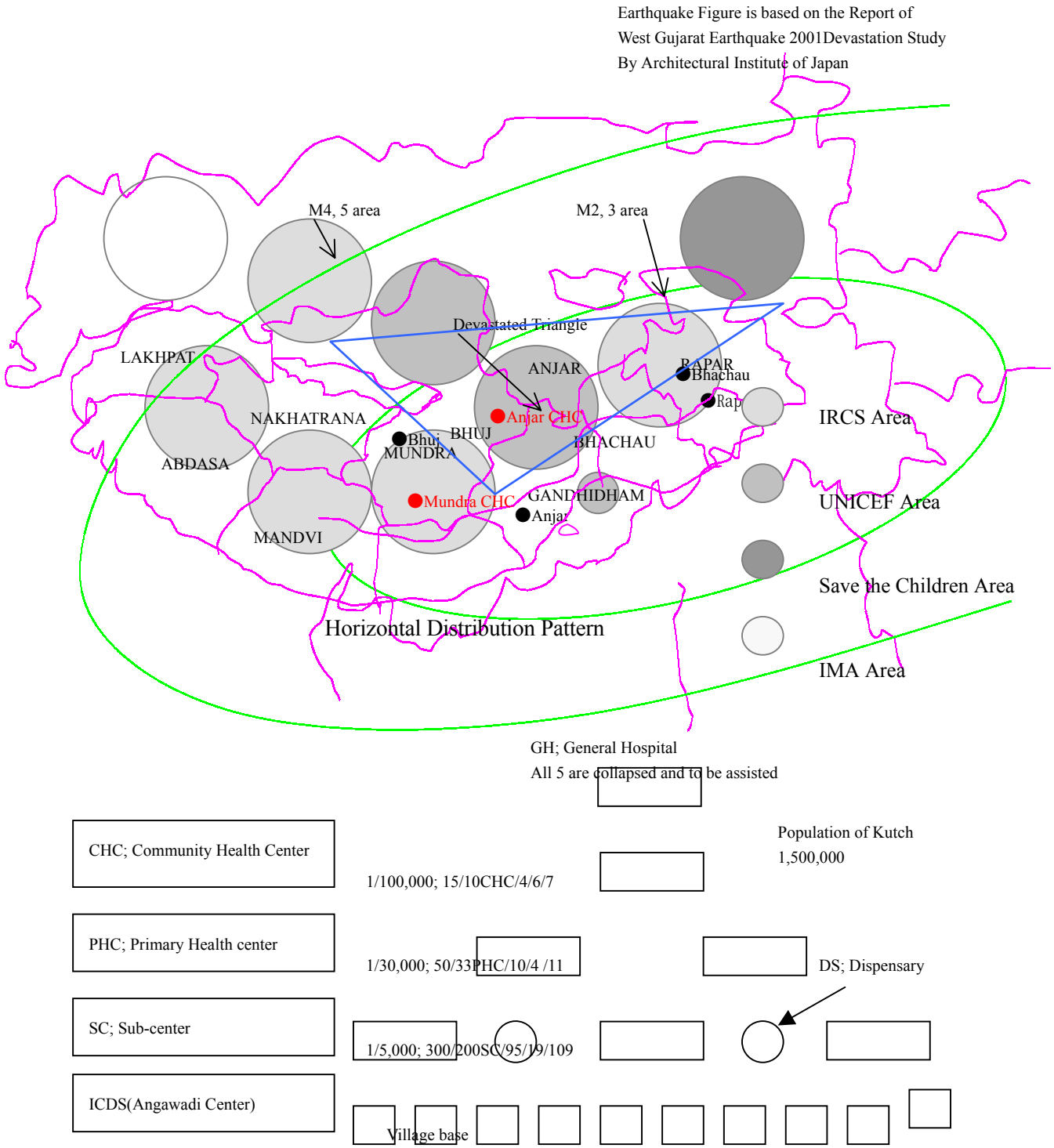
Regarding the above matter, because Japan has suffered from the Great Kansai-Awaji Earthquake, it is thought that the contribution to such technical fields in India is meaningful, as a country with frequent earthquakes.

Situation of Assistance in the Basic Healthcare Sector

Up until now, the assistance of UNICEF has been thorough, as also has been that of the Red Cross and Save the Children, who together these 3 organizations have provided large scale assistance. They have each provided reconstruction assistance for 321, 352 and 144 Anganwadis respectively and 81,1 and 12 sub-centres respectively also. Other assistance has been for sub-centres, primary health centres and community heath centres, and also for general hospitals, for which Merlin and the IDBI, and other medium-size assistance organizations have provided numerous applications of help. Smaller scale support organizations have generally provided help for individual healthcare facilities. Firstly, let us look at the vertical distribution pattern of assistance.

Assistance for General Hospital Facility Layer

Of the numerous damaged general hospitals in Kutch district, there is the Prime Ministers Project for Bhuj General Hospital, the MOL assistance for Bhuj mental hospital, the IMA (Indian Medical Association) assistance for Gandhidham general hospital and the Delhi City assistance for Mandvi general hospitals, a total of 4. In addition, Gem & Jewellery are providing assistance for the Limbai general hospital in Sarendranaghar district. Of these, Mandai General Hospital is not progressing so smoothly, and there are possibilities of changes to the assistance organizations.



Vertical Distribution Pattern

Fig.-4-14 NGOs/Agencies' Activities of the Basic Healthcare Sector in Kutch District

Table-4-4 Projects and/or Programmes of other Donors and/or Agencies for Basic Healthcare Sector in Kutch District

Donors/Agencies	Project/Programmes	Notes
The United Nations (UNICEF) Creating child friendly Spaces	1st Request Short Term 2nd Request Medium Term Long Term (Plan for all) 76 prefabricated and electrified Angawadi Centers with sanitation units 500 liter water tank 145 prefabricated and electrified Health Sub Centers with 3,000 liter water tanks	$ 2.1 million $ 16.0 million $ 1.5 million (01/11/19data for Kutch) 81SC, 321AW **All SC under construction** 93 AW site prepared, not started 9 AW waiting town planning 27 AW problems to solved 192 AW construction stage
World Bank/ADB	Damage estimation $50.17m.	
International NGOs 1. IRCS 2. Save the children 3. Merlin 4. EC	1. 6PHC, 1SC, .352AW, 8DS 2. 1PHC, 12SC, 114AW, 3DS 3. 9SC, 1DS 4. 0	1. PHC/SC/DS designed by NGO, but no schedule for AW s Some problem of fund 2. SC/DS started, AW not fixed 3. **All constructed** 4. No information
National NGOs 1. Gem&Jewellery 2. CII 3. IMA 4. IDBI 5. MP LAD Scheme 6. PMO 7. J.W.Global 8. CAF 9. Delhi Municipal Corporation 10. Action Ministeries 11. Seagram Mfg. Ltd. 12. M.P.LADS.	1. 1CHC 2. 1PHC, 5SC,1DS 3. 1GH 4. 2PHC 5 1MH, 1CHC, 1SC, 6. 1GH 7. 1CHC 8. DS 9. 1GH 10. 3DS 11. 1PHC□12. 1CHC	1. CHC checked 2. Under approval 3. 1 GH designed 4. Designed, under scrutiny 5. No Information 6. Plinth excavation (base) 7. No information 8. **All constructed** 9. Money deposited to funds 10. No response, to be new NGO 11. No detail offered 12. No Information
GOG	1 CHC	1 planned, 2 no information
GOJ	2 CHC	Construction stage
GH; General Hospital, CHC; Community Health Center, PHC; Primary Health Center MH; Mental Hospital, SC; Sub Center, DS; Dispensary, AW; Angawadi Center (Day Nursing Center) GOG; Government of Gujarat, GOI; Government of India, GOJ; Government of Japan, m; million		

As in the Table above, 4 general hospitals, 7 community health centers, 11 primary health centers, 109 sub centers, 784 anganwadis, and 17 dispensaries are adopted by NGOs/Agencies.

All four general hospitals are adopted; all collapsed. All 7 CHCs are adopted; 4 collapsed and others were damaged. All 11PHCs are adopted; 4 collapsed and others were damaged. 109 of 251 sub centers are adopted; 95 collapsed and 24 damaged. 17 of 37 dispensaries are adopted; 16 collapsed and 1 damaged.

Assistance for CHC, PHC Facility Layer

The IRCS is a large-scale assistance organization providing support for 26 PHCs. In addition, the EC is supporting 2 CHCs, the GOG 1 CHC, JICA 2 CHCs and then other smaller-scale assistance organizations proving support for separate single facilities. The IRCS are providing support for 9 facilities in their realm of influence, but there are problems in ensuring funds, and overall the support is not proceeding so smoothly.

Assistance for Sub Center Facility Layer

UNICEF is actively providing assistance for 81 facilities. These are overlapped with the assistance for the primary educational sector (Creating Friendly Space for Children), and can be considered as one large project. The IRCS are supporting 6 facilities, Save The Children 12 facilities, and the Merlin organization assistance for 6 facilities. Compared to the number of facilities, the number of support organizations is small. However, they are well-experienced organizations providing healthcare support all over the world. This means that this layer is fundamental to the communities' healthcare services.

Assistance for ICDS and DS Facility Layer

UNICEF are providing social development assistance for ICDS (Integrated Child Development Services) including day nursery centres for pregnant women and pre-school age children, called Anganwadi. They are meant for use for under-nourished children and as places of special education, and perhaps are not only mere healthcare facilities but also places having functions for the sectors of education and welfare. For regional social work, before the earthquake struck there were ongoing projects progressing, with the support organizations of UNICEF, Save the Children and the IRCS only involved. As for the dispensaries, facilities for supplying medical products, 8 IRCS, 3 facilities supported by the Save the Children and 3 by Action Minister, and others are supported as single facilities by single NGO.

Horizontal Distribution Pattern of Assistance

Lower part of Fig.-4-13 shows the horizontal distribution of assistance. Although there is the assistance for the basic healthcare facilities, one senses the flow of the large overall assistance main stream by the United Nations. Actually, within the devastated triangle zone, the basic healthcare facilities of Bhuj and Anjar are almost all under the assistance scope of UNICEF. Within this area, JICA are carrying out the assistance for the large scale CHC at Anjar, and it might be said that UNICEF come to have a high regard for JICA's relief system. Of the other large-scale assistance organizations, the IRCS are providing a lot of support in the Southwest region of Kutch district in Mundra, Mandvi, Abdasa, Nakhatrana and the east part of Bachau, and in Rapar where there are many problems, Save The Children is providing most of the assistance. However, as shown in Table 4-3, the support of the IRCS has stopped and the situation is worrying.

The significance of this Project in the Vertical/Horizontal assistance

Looking at the distribution of large-scale assistance relating to healthcare, within the disaster triangle zone of Bhuj and Anjar the regional basic healthcare ICDS/SC facilities are almost the object of UNICEF assistance. In Bachau, another region in the triangle zone, the IRCS is providing assistance. Further to the East in Rapar, Save the Children is making the most effort. In the Western zone of Mundra, Mandvi, Abdasa and Nakhatrasa, the IRCS is very active. In Lakhpat, where there was little damage to the facilities, no assistance has been made for any facilities. Small-scale assistance is widely scattered throughout, and there is no special regional distribution pattern. It can be said that the assistance from this Project provided for the CHCs at Anjar and Mundra, is, in terms of the distribution of assistance, well located and of high priority.

(4) Village Structure and Rebuilding Support

Village Structure and Facility Aid

For the Specified Sector Facilities Support, UNICEF is implementing the project of New Child-Friendly Spaces for the Children of Gujarat as the following concept.

UNICEF Programme

Based on its experience of emergencies in India and other countries, UNICEF gave an immediate priority to the reopening of schools. Going to schools goes beyond education. A Classroom is a place where the child feels safe and finds a sense of normalcy. This intervention was combined with an innovative strategy to help traumatized children. Re-opening of ICDS (Anganwadi) and sub-health centers was also considered a crucial intervention as they provide health, nutrition and pre-school services to mothers and young children.

For the above mentioned, UNICEF planned the aid facilities such as 176 nos. day-care nurseries, 500 nos. of water supply tanks, 145 nos. sub-centers having water supply tanks of 3,000 ton capacity and 600 nos. schools.

As for current situation, it is, as a mainstream of Gujarat reconstruction, steadily producing excellent results as shown in Table-4-2, 3 and Fig.-4-12, 13.

Center Core of Village

Firstly, the United Nations, especially UNICEF activities are remarkable for the continuous

development projects for Child Education and Healthcare Aid, which has been started since before the earthquake disaster.

UNDP is also highly motivated to the Social Environment Reconstruction and Maintenance.

Sumarasar

It is located in Bhuj sub-district but considerably in the outer edge area, and there is active livestock farming and dairy farming.

There is an open space about 300m square and forms a centre core of the village.

There are also religious buildings and village offices, and it seems that a day-care nursery by UNICEF has been built near the water supply tank.

The primary school is the core of village central structures, and will be an incentive and symbol to village reconstruction.

The population of Bhuj is 195, 258, and 117, 256 are concentrated in Bhuj city.

Bhuj is the seat of Kutch district, has a large circular lake surrounded by the old town and royal palace, and has many historic structures and a large wall encircling the city, and is so called the fortress city.

Bhadreshwar

Bhadreshwar village is located in Mundra sub-district, 18 km northeast of Mundra city.

The old Bhadreshwar girls' school had been located in the congested old town, a few hundred meters southeast of the centre of village, and was a sensitive and beautiful building like a nunnery.

The reconstruction at the existing location was cancelled, because there was no suitable access road for the construction and the existing buildings are valuable architecturally and historically are to remain, and the final location was decided nearby the boys' school.

The combined total classroom for boys and girls is 14, so it is a relatively large primary school.

In the center of this village, there is an ex-mosque being utilized as a cemetery, some small Hindu prayer buildings and the site for the junior high school, and has a rather congested structure and relatively small area.

If the city planning allows, a slight expansion of this area would be better.

There are 2 day-care nurseries, and one by UNICEF is under construction.

In Mundra city of Mundra sub-district, JICA is making a maternity building of Mundra CHC, and the presence of Japanese aid exists around this area.

The population of Mundra sub-district is 71,250.

Mathak

Mathak is a rural community, located in Anjar sub-district and 6km south of Anjar city.

The village reconstruction aid organization for the overall village has decided the facilities, however there is a conflict for the primary education facilities aid with the NGO of Good Samaritan (Shri D J Pandyan), and it took time for coordination.

The construction of the steel prefabricated school has been started, and the problem of its removal has occurred.

UNICEF is also constructing 3 day-care nurseries.

The triangle shape open space of the village is not so large, though there is a flag-hoisting pole and three temples, one is adjacent and the other two are near the approach.

The aid object facilities are the large elementary school having 9 classrooms.

The approach to the main road is 400m and is not far, and a gate at the main road showing the direction to the entrance of village is being constructed.

The population of Anjar sub-district is 85,651.

Dhamadka

Dhamadka is located 24km northeast of Anjar, and is in Anjar sub-district, though it is also near Bachau sub-district.

The village is relatively near the main road.

The village open space is in between the elementary school area and the village office.

There is a flag-hoisting pole and a temple nearby having an approach.

UNICEF has 2 day-care nurseries, and one of them is under construction.

The primary education facilities are the 7 classroom primary school.

Bachau city was heavily destroyed and is in a serious condition.

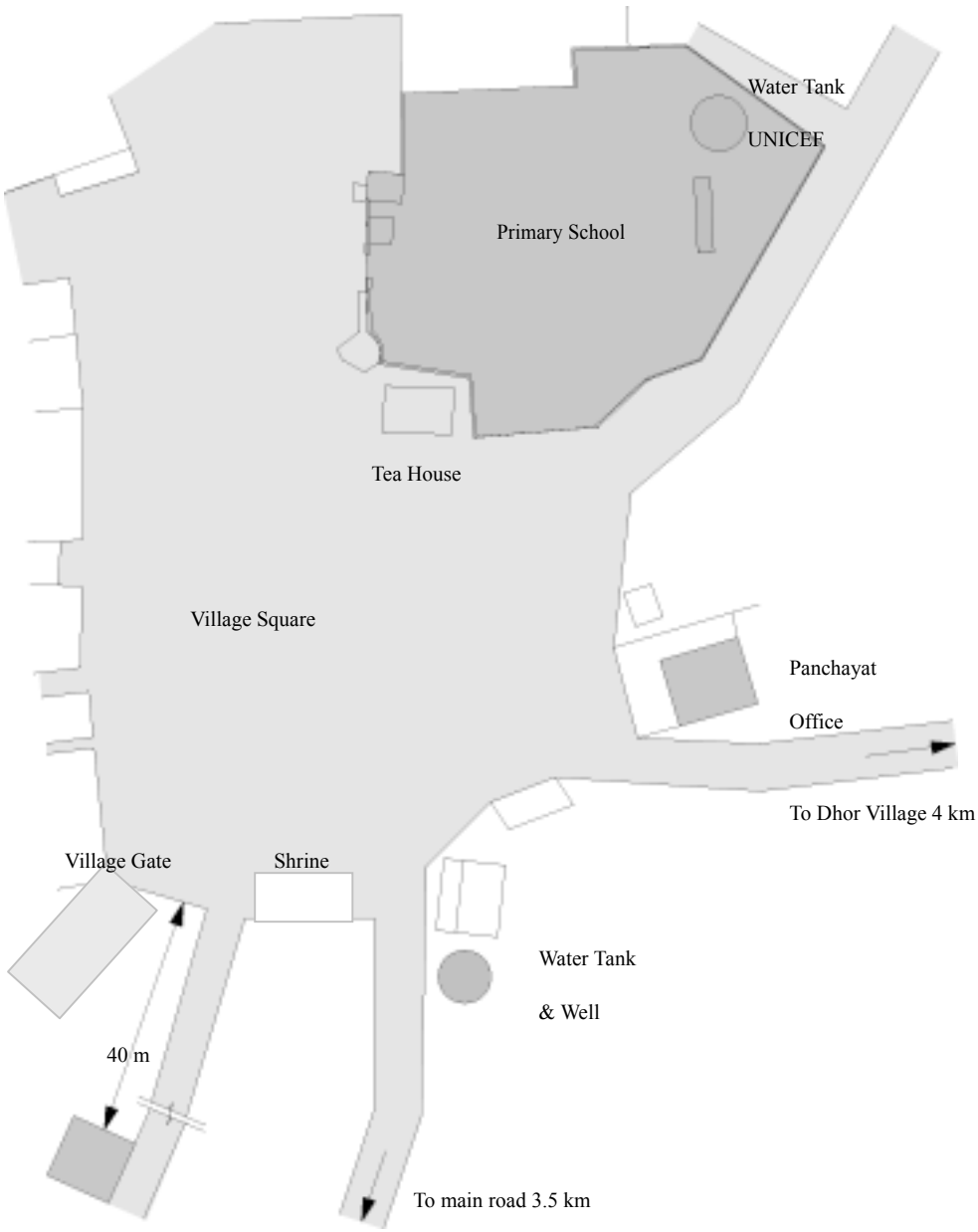
Aid Method

As outlined above, JICA urgent reconstruction aid object facilities are the CHCs which are located in Anjar and Mundra, both in the ellipse zone of the extremely intensive earthquake strike, and the primary education facilities which are located in Bhuj, Mundra and Anjar sub-district, all in the most seriously affected triangle zone, and it is said that they were all appropriate objects of aid because they have a great urgency and Japanese aid presence was expressed.

However, as it appears in the village core structure, they are placed in important areas of the villages, and are to be key facilities for future development of the village structure and have a rather strong incentive to the surroundings than the other single aid objects.

Because of the above matter, even though there were many requests of change from the village, the flexible measures have been taken account of as much as possible for the consideration of the above.

Because it was an urgent disaster reconstruction aid project, the method of aid was based on quick implementing methods, however if the method had been changed and the time frame was not so tight, then the various steps, such as participant pattern “village making” with workshop session, selection of site, establishment of design conditions, design and construction, would have been considered.



Sumarasar Sheikh Village Core

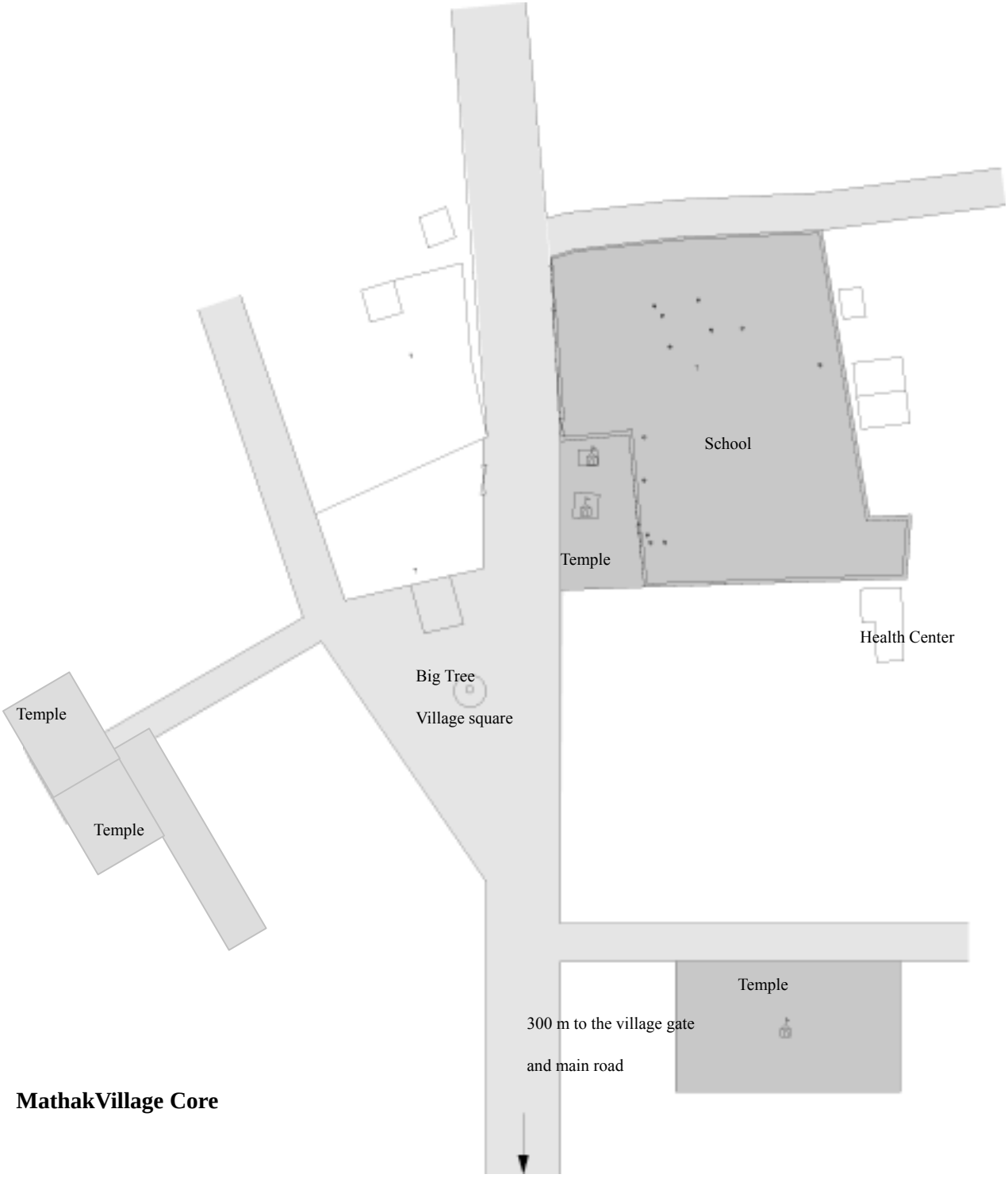
Location;	Bhuj Taluka, 12 km Northwest of Bhuj City
NGO adopted for the village;	Not identified
Primary Education Facilities;	JICA5 classrooms
Basic Healthcare Facilities;	UNICEF1day nursery center (AW), under construction

Fig.-4-15 Village Core of Sumarasar Sheikh

Bhadreshwar Village Core

Location;	Bhadreshwar Village, Mundre Taluka, 18 km Northeast of Mundra
NGO adopted for the village;	Not identified
Primary Education Facilities;	JICA 8 classrooms for boy's school, 6 classrooms for girl's school
Basic Education Facilities;	UNICEF Day nursery center 1, under construction
	IRCS Day nursery cemter 1 planned
Mundra City;	JICA CHC Project for 18 bed maternity building

Fig.-4-16 Village Core of Bhadreshwar



MathakVillage Core

Location;	Mathak Village, Ajar Taluka, 6 km South of Anjar
NGO adopted for the village;	Good Samaitan (Shri D J Pandyan)
Primary Educational Facilities;	JICA 9 classrooms
Basic healthcare Facilities;	UNICEF 3 day nursery center (AW), under construction

Fig.-4-17 Village Core of Mathak

Dhamadka Village Core

Location;	Dhamaduka Village, Anjar Taluka, 24 km Northeast of Anjar, near Bhachaw Taluka
NGO adopted for the village;	Not identified
Primary Education Facilities;	JICA 7 classrooms
Basic Healthcare Facilities;	UNICEF 1 day nursury center (AW), under construction, 1 AW planned
Anjar City;	JICA 50 bed community health center, under construction

Fig.-4-18 Village Core of Dhamadka

4.3 Rebuilding Plan for Future Educational Facilities

The rebuilding of the future educational facilities include not only primary educational facilities but also secondary and higher educational facilities as well.

India has progressively participated in the International activities as in the following table, so that the international earthquake support has been smoothly extended so far:

1949	SET UP THE INDIAN NATIONAL COMMISION FOR COOPERATION WITH UNESCO (INCCU) ACTIVE ROLL IN UNESCO
1949	THE EDUCATION FOR ALL SUMMIT OF NINE HIGH POPULATION COUNTRIES HOSTED BY DEPARTMENT OF EDUCATION UNESO, NICEF, UNFPA, AND OTHER CO-SPONSORS
1998	UNESCO-UNEVOC INTERNATIONAL CONFERENCE ON VOCATIONAL EDUCATION IN THE ASIA PACIFIC REGION IN ADERAID MINISTER FOR HUMAN RESOURCES DEVELOPMENT WITH JOINT SECRETARY, PRIVATE SECRETARY, 2 PROFESSORS ATTENDED
1998 APR.	THE 154TH SESSION OF THE EXECUTIVE BOARD OF UNESCO FORMER FOREIGN SECRETARY AND INDIA'S EXECTIVE MEMBER OF THE BOARD ATTENDED
1998 SEPT.	THE SECOND JOINT MEETING OF SIX INTERGOVERNMENTAL COMMITTEE IN CHARGE OF THE APPLICATION OF THE REGIONAL CONVENTIONS ON THE RECOGNITION OF STUDIES,DIPLOMAS AND DEGREES IN HIGHER EDUCATION AT UNESCO HEADQUARTERS ,PARIS JOINT SECRETARY IN DOE ATTENDED
1989 OCT.	THE 155TH SESSION OF THE EXECUTIVE BOARD OF UNESCO THE SAME MEMBERS ATTENDED
1998 NOV.	THE WORLD CONFERENCE ON HIGHER EDUCATION AT PARIS MINISTER FOR HUMAN RESOURCE DEVELOPMENT AND THE INDIAN DELEGATION ATTENDED
1998 OCT.	THE SECOND MEETING OF THE INTERGOVERNMENTAL REGIONAL COMMITTEE ON EDUCATION IN ASIA AND THE PACIFIC (EDCOM) AT UNESCO, BANGKOK ADDITIONAL SECRETARY OF DOE ATTENDED

Fig.-4-18 Recent Chronicle of International Cooperation in Education

- Education in India P192

(1) Primary educational facilities

The reconstruction of the primary educational facilities involves the overcoming of difficulties and problems by means of slow steps and steady strategies.

It has been studied through the observations by the Team of the implementation of several primary schools in the Kutch district that the post-earthquake rebuilding operation of the primary educational facilities as the basic social infrastructure of the affected areas has been bringing in a momentum of revitalization for the devastated communities by GOG/GOI, NGOs and national and international agencies, and is described in the following sections.

1) Difficulties

Major fundamentals of difficulties are expected to arise due to financial measures with insufficient budget from the GOG/GOI, and from national or international NGOs or agencies, and from administrative matters with the shortages of manpower to manage the implementation of rebuilding thousands of classrooms.

2) Problems

Problems in the rebuilding of the schools are how to physically locate/relocate the sites in the severely deteriorated villages and towns/cities.

The Master Planning for villages and towns/cities should be basically prepared before the location/relocation and commencement of design and construction works

3) Slow Down

The rebuilding of schools should be in line with the rebuilding methodology of the communities. The cultural and traditional goodwill discrimination of identity in various castes and tribes should be used as the basis of master planning for the structures of villages and towns/cities in the districts said to have such kind of communities.

4) Steadiness

The rebuilding of the basic social infrastructures in general should be carried out at a slow and steady pace so as to cope with the difficulties and the problems as mentioned above.

5) Village Structure and Primary Educational Facilities

Village Structure

In the urban integrated areas like Bhuji City, Anjar City, etc., the city planning is currently under progress, and consequently the rebuilding of primary educational facilities remains behind there.

Even in this study, there was a proposal for the primary educational facilities aid in Bhuj, however it was eventually excluded because of the above-mentioned reason.

As a result the subject of primary educational facilities aid for this study included only those at the existing facilities areas located in the village cores, which were left behind in the urban development program.

In any case, the facilities are located in a core area, where the village streets converge, or in the vicinity of that area, and mostly the streets become wider and become a public square there. In the square, there are villagers gathering, hawker shops for sundries and foods, and there are temples, mosques and old graveyards along the streets.

The project site for two schools in Bhadreshwar is exactly located in such a village core, and some women carrying water vases were around the public well inside the square, when the Team visited the site. In the vicinity, there is a housing complex consisting of relatively large houses and many of the houses have a shop at their ground floor. From the center of the square towards the outer area, middle class housing is concentrated along the street, and simple houses like farmhouses are scattered at the periphery. The village core and the conceptual figure of its surroundings are shown in Fig.-4-3 and Fig.-4-4, 4-5 respectively.

Since most of villages were seriously destroyed, the text mentioned above was described taking certain imagination into account based on the research of comparatively lightly hit earthquake disaster areas.

Public Function of Primary Educational Facilities

When this site investigation was taking place in a village, a senior of the village came along with children, and in many cases he was the ex-headman of village ex-sarpanch.

The present village head (sarpanch) might have been watching this elsewhere.

While the ex-head often tried to entertain the investigators with cold drinks, that had to be actually a good opportunity to talk with the villagers for a while, but there is not a suitable place to do.

Despite the fact that the design work was already being carried out based on the information collected during the investigation, the project was refused sometimes by the present village headman for the reason that some other aid organizations were offering such aid programs to cover the whole village area.

However, as it was not an acceptable matter, the measures to convince the villagers were taken through local partners such as the director of the primary education department, the director of Kutch

district (Collector), the district development administrator and his staff, and the rural district development administrator.

If there was a public space in the village, the communication exchange could have been done much more efficiently there and a lack communication could have been avoidable.

There was, in fact, no good public communication space in the village.

As it can be seen in the highly praised musical “Lhagan”, it seems that a living room of the village-head/ex-village-head was the “Pro-Space for Village Communication and Resolution.”

A similar case can be seen in the feudal period of Japan, and even now the round-table talk is still taking place in the refurbishment process of the straw-thatched roof of Shirakawa Village in Japan.

However, the village structure should be modified to a democratic and humanitarian structure.

The Angawadi (day nursery center) of UNICEF has a potential position of the Social Activities for Children and Women and is a base of the Preschool Basic Education.

Moreover, the Angawadi has a positive target of the Primary Education Facilities Aid, which is also planned near the village core so that it could be an incentive for the village structure change.

The primary education facilities will be also utilized as a place for the exchange of villager’s opinions.

Through these activities of aid, the village, rural district, State and even country could be changed.

According to the consideration above, it is apparent that the primary educational facilities aid has a significant meaning in the program.

Visible Space

The primary educational facilities aid has, therefore, an implication to the society of villages as follows.

The streets, major public facilities and central housing become the elements of composition of the Visible Space of the Village Structure.

The village structure should be changed to various spaces such as the child-friendly space, the non-oppressed women space, the space of practicable decentralized administration, the space of practicable universal (all children) education, the space for poverty elimination and the space for discriminated tribes and ethnic minorities to coexist.

The Primary Education Facilities and Regional Fundamental Medical Welfare Facilities (Anwgawadi day nursery center) will function as a major element.

Invisible Space

In India, especially at the peripheries like in Kutch district, the complicated structure of castes/tribes is a body of the group depth conscious structure of the village and is from the invisible cultural structure, i.e. history, custom and tradition, which has been a key element of the place in the course of a long history.

In such an invisible structure, it can be said that the school is a crucial element as a public space admitted by the inhabitant there without any discrimination.

Therefore, the rebuilding of schools is significant not only as it is, but also for the reconstruction of the village.

Methodology

The methodology of village reconstruction proposed by GSDMA is the manner of the steering committee for town making organized by participants of the district.

It is planned and constructed by the participants of the old leaders of the district and the new comers like women, discriminated tribes, NGO volunteers, etc., and the budget is to be shared by the State government and the aid organization half-and-half.

Even in the analysis as of now, it is apparent that the primary education facilities plays an important role in the reconstruction of the village, therefore the town-making by means of village people participation is a basic pre-requisite for the reconstruction of group consciousness structure.

Ideal Space / Ideal Methodology

Fundamentally, a set of ideal spaces of the primary education facilities should be substantiated through the discussions on the “ideal space” therein.

Accordingly, in the process of change of village cultural structure as aforementioned, the primary educational facilities can be built upon the understanding and agreement of the village.

In this Project, the short-term program was unavoidably adopted due to the limitation of the urgent aid for the earthquake recovery program, and the participant program could not be considered because it requires a long term and a large manpower.

It is looked upon as an unavoidable decision under the urgent circumstances.

This should be considered in the event of continuation of the aid.

At the time of site investigation the structural system of existing primary education facilities at

Badreshwar, Sumarasar Sheikh and so on were found simple and non-earthquake-resistant made of cobble stone masonry work.

In the beginning of the investigation, it was a tragic scene of complete collapse, whereas it took some time to recognize the meaning of the project, as a symbol of the future of the village, after completion of the facilities that are the first modern public facilities, creating the most contemporary space among the village housing which are mostly one-story, with stone masonry walls and straw-thatched roofs.

The facilities implicate an architecture of tomorrow, colored in white, flat roofs supported by columns, just like some high level sophisticated educational facilities located in the school zone of Ahmedabad, surrounded by the riches of Indian nature.

(2) Higher Educational Facilities

1) Damage of Higher Education in General

As in the table in 3-7 the damage in terms of cost of the higher education and technical education was estimated to be Rs. 122.7 crores by the WB/ADB with 106 institutions affected. The percentages of respective damage cost to all educational facilities are as follows:

Table-4-5 Overall Damage of Educational Facilities

No.	Sector	Damage Cost	Percentage
1	Primary education	Rs. 325.6 crores	49%
2	Secondary education	Rs. 223.0 crores	33%
3	Higher education	Rs. 40.9 crores	6%
4	Technical education	Rs. 81.8 crores	12%
	Total	**Rs. 670.5 crores**	**100%**

Almost half of the total damage was in the primary education sector and this will be analyzed in other later sections.

The secondary education is basically managed by the private sector, so will be restored firstly by private organizations.

The damage to higher education is only 6% of the total. This is not so big a share and will be able to be managed by GOG/GOI without any assistance from outside.

The technical education damage is 12% of the total. All major technical educational institutions in Bhuj have been damaged so severely as to be not in use even now.

This rebuilding of technical educational facilities as basic social infrastructure can be the objectives of assistance from technologically progressed countries.

So the next section will focus on the reconstruction of the technical education in the affected areas.

2) Overview of technical education in the State of Gujarat

In the State of Gujarat there are 59 government run, 51 grant-in-aid and 25 self financing technical institutions conducting post-graduate, degree, diploma, and certificate level courses with an enrollment of 15,092, 13,547 and 11,524 students respectively, excluding students in post-graduate courses. Totally there are 135 institutions and 40,173 enrolled students. This overview is based on resources informed as of June 2001.

(a) Development of technical education 2000-2001

The Development has been carried out in:

- Establishing many self-financing institutes
- Rationalizing the seats in government run institutions to optimize the organization.
- Helping to increase the seats from 1,530 to 3,540 in the Diploma Engineering through Distance Learning Programmes.
- Establishing the Centre for Research & Industrial Staff Performance (Indo-German collaboration) Extension Centre at Gandhinagar.
- Implementing the Canada India Industry-Institute linkage Project in 4 polytechnics and 2 engineering colleges.
- Implementing the projects of 4 polytechnics for involving Physically Handicapped Persons in Vocational and Technical Education
- Constructing the Geodesic Domes at earthquake affected areas by polytechnics communities.
- Establishing the Microsoft Training Centre at L.D. Engineering College, Ahmedabad.

(b) New approach in Technical Education

New approaches have been tried:

- Establishing the Gujarat State Council for Technical Education
- Starting the TechSAT Programme
- Enforcing the common entrance test
- Enforcing the common entrance test for the engineering courses after the 12^{th} standard.
- Establishing the Dhirubhai Ambani Institute of Information and Communication Technology.

(c) Long Term Planning of Technical Education

Various long term planning projects are being prepared by the directorate such as:

- The Project for the Reconstruction of the Engineering College at Bhuj.
- The Project for the Establishment of Center for Excellence in an engineering college under the World Bank Assistance.
- The Project for the Conversion of S.V. Regional Engineering College, Surat into the Indian Institute of Technology Status Institute.
- The Project for establishing the Institute of Seismology and Research.

(d) Problems of Technical Education

The problems and difficulties in the progress of Technical Education are as follows:

- Staff shortage
  - Post Graduate and Research
  - Assistant Librarians
- Autonomy for Govt. and Grant-in-Aid Institution
  - Educational
  - Financial
  - Administrative
- Control over the Self Finance Institutions and Universities
- Common Grant-in-Code for aided Institutions
- Total Implementation of A.I.C.T.E. (all India Council for Technical Education) Packages
- R. & B. (Department of Construction) Maintenance Grant
- Appointment of Warden in the Hostels
- Revision of Tuition Fees (Ratio of Fees for Free and Payment Seats)

(e) Steps taken by Technical Education Department after Earthquake

The following procedures have been carried out by the Department:

- Data Collection
- Proposal Submitted to different agencies for funding
- Rehabilitation Activities
- Re-Establishment of Academic Activities
- Transfer of Degree and Diploma Students of Bhuj to Ahmedabad and Palanpur for their

study

- Diploma Level Examinations postponed for two weeks
- World Bank assistance of Rs. 100 crores received for the re-establishment of technical institutions in the State

(f) Budget Allocation for the year 2001-2002 plans to reduce the expenditure

- The budget reducing measures will be taken in:
- The Distance Learning Mode of the Engineering Degree combined with the Diploma Distance Learning Mode
- The appropriate plans for the student hostel facilities combined with other plans of institutions
- The scholarship scheme to the students of technical institutions now being discontinued

(g) Budget Allocation for the year 2001-2002 plans to increase the allocation

The important areas for which more allocation is required are as follows:

- Rs. 3.58 crores required for the repairing of buildings to 18 technical institutions where World Bank Assistance is not available
- Budget allocations to technical institutions under continuous schemes are as below;

– Revenue Head	Rs. 16.87 crores
– Capital Works	Rs. 6.14 crores
– Earmarked Head	Rs. 1.25 crores
– (T.A.S.P.)	
Total	Rs. 24.26 crores

(h) Budget Allocation for the year 2001-2002, Additional Allocation

Additionally allocation will be required as:

- Requirement of Rs. 5.16 crores for the reconstruction of the classrooms, water supply, equipments and teaching staff etc. in the degree, diploma and allied courses
- Rs. 33.00 crores is required under the plan for the year 2001-2002

3) Post-earthquake situation of technical education

For the overall damage to educational facilities, numbers and costs are listed in the table in (1).

The post-earthquake situation of technical education in the State of Gujarat specifically informed by the Department of Higher & Technical Education of the State is as follows:

(a) Loss of Lives

The losses of Lives in the Technical Education Sector are listed in the table below:

Table-4-6 Loss of Lives in Technical Education

No.	Institutions	Govt.		Private		Total	
		Staff	Students	Staff	Students	Staff	Students
1	Engineering colleges	1	1	0	1	1	2
2	Polytechnics	1	3	1	12	2	15
3	Pharmacy Colleges	0	0	0	1	0	1
	Sub Total	2	4	1	14	3	18
	Total	**6**		**15**		**21**	

(b) Loss of Property

The losses of properties in the Technical Education Sector are as in the following Tables:

Table-4-7 Loss of Property in Technical Education

N. = Number, Amount in Rs. Crores

No.	Institute Damaged	Public / Government Assets					
		Totally Collapsed		Partially Collapsed		Total	
		N.	Amount	N.	Amount	N.	Amount
1	Engineering Colleges	1	55.00	5	90.00	6	145.00
2	Polytechnics	1	135.00	20	135.00	21	270.00
3	Technical High Schools	1	13.00	100	47.00	101	60.00
4	Pharmacy Coleges	1	17.00	190	12.50	191	29.50
5	Administration Offices	0	0.00	3	0.50	3	0.50
	Total	**4**	**220.00**	**318**	**285.00**	**322**	**505.00**

The aforementioned World Bank Report estimated the total damage to the technical education sector as Rs. 81.8 crores, only 16% of this estimation. The difference may be due to the quantitative preciseness and qualitative exactness of rebuilding design now being carried on by the directorate compared with the assumed calculation soon after the earthquake by the WB/ADB people.

(c) Training Programmes

The short and mid term training programmes have been proposed as:

- Damage Management
- Strategic Planning for the procurement of goods, civil works etc.
- Hazard assessment activities in the State.
- Content updating

- Regional specific disaster management
- Disaster Modeling
- Decentralized, community based, State-wide, multi-hazard disaster management planning process
- Crafts up-gradation
- Various agencies like ITTs, AMA, IIM, CEPT, NCCB&M, TTTI etc. contracted for proposals

(d) Planning for Repair

The proper repairing of partially damaged facilities is important in rebuilding of educational sectors to lessen the amount of rehabilitation budget. The outline of the repairing of the facilities are:

- Repair of institutions under WBA (World Bank Assistance) for;
  - 3 Govt. Enginnering Colleges
  - 14 Govt. Polytechnics
  - 1 Pharmacy College
  - 15 Govt. Technical High Schools
- Administrative approval has been received from GSDMA for Rs. 6.4087 crores for repairing the above institutions.
- Repair of the above institutions shall be carried out by the R & B Department.
- Repair of other facilities not covered under WBA shall be carried out through the State grant.

(e) Intermediate Shelters

It is an impressive experiment to design Geodesic Domes as intermediate shelters in the devastated engineering education campuses. The outline of providing these prefabricated light structures is as follows:

- The study of the students admitted in the year 2001-2002 to engineering colleges and polytechnics will start in the intermediate shelters from the next academic term.
- 180 students of polytechnic of earlier semesters shall continue to study at Bhuj.
- The Geodesic Domes will be provided as in the following table:

Table-4-8 Geodesic Domes Utilized in Technical Education

GD = Geodesic Dome T. = Temporary

No.	District Name	GDs to be constructed	GDs constructed	T.office to be constructed	T. offices constructed	Future Total
1	Kutch	42	11	20	2	62
2	Surendranagar	12	0	0	0	12
	Total	**54**	**11**	**20**	**2**	**74**

- Defined as temporary shelters
- GSDMA has given administrative approval for Rs. 0.1782 crores for temporary shelters (office shed)
  - V.T.C., Madhapar and Govt. Engineering College, Bhuj Rs. 0.0594 crores
  - Govt. Polytechnic, Bhuj Rs. 0.118 crores

  (Works shall be executed by the R & B Department)

(f) Fund Utilization

Expected utilization of funds at the time of proposal to the WBC were as in the list below:

Table-4-9 Fund Utilization Originary Ecpected in Technical Education Sector

No.	Institutes	Cost of Reconstruction	World Bank Component		
			Phase - 1	Phase - 2	Phase - 3
1	Govt. Engineering College, Bhuj	435.00	250.00	185.00	435.00
2	Govt. Polytechnic Bhuj	150.00	120.00	30.00	150.00
3	Govt. Vocational Training Centre, Madhapur	20.00	10.00	10.00	20.00
4	Pharmacy College Lakhtar, Suerendranagar	25.00	15.00	10.00	25.00
5	Repairs of Various Institutions in the State	50.00	50.00	0.00	50.00
6	Procurement of equipment and others	240.00	125.00	115.00	240.00
7	Consultancy, Survey, Design, Supervise	50.00	25.00	25.00	50.00
8	Capacity Development Training	30.00	15.00	15.00	30.00
	Total	**1,000.00**	**610.00**	**390.00**	**1,000.00**

4.4 Rebuilding Plan for Future Healthcare Facilities

The fundamental situation of healthcare in the Gujagat State is quite simply noted in the Human Development Index 2010 disclosed by the Health Minister outline below:

1. On June 26th, **the Human Development Index 2010, the Action plan for prevention of disease**, was unveiled by the health minister Sureh Mehta at a meeting chaired by the chief minister Keshubai Patel.

2. The main component of the programme is **to stem the spread of HIV/AIDS, to contain child and mother mortality and to control TB and malaria**.

3. The detail of the action especially for the rural sector is to be sought in **the co-operation with the private health trust, service oriented doctors, and experts in the private sectors.**

4. To achieve the target of Human Development Vision 2020, GOG provides Rs. 4020 crores. The annual plan is to provide **only Rs. 240 crores**. The rest (**Rs. 3,780**) **would be made with the assistance of foreign agencies**.

5. The action plan for the year 2001-02 is to be stressed on the need for **the extensive research, both in the allopathic and ayurvedi treatments** for the cure of diseases, which are presently beyond their scope.

6. GOG has already commenced **the district units of AIDS, and other diseases and for mental health care.**

7. **8,040,000 children were inspected under school health programmes and 400,000 cataract operations were conducted in the State, which is a record in the country**.

8. It is necessary that proper impetus be laid on the **concept eye donation** and on the popularizing of the Concept. And launching **a cleanliness drive** in the government run hospitals will be needed. **The community health services should be handed over to private trust for effective results.**

9. Measures to be taken on the need of research **and development of quality control for raising the consciousness of health services through the State**.

4.5 Rebuilding Plan for Overall Town Planning

Many towns and villages have been completely destroyed by the earthquake. So in those areas there should be some preliminarily town master planning or village master planning and then the basic infrastructure should be reconstructed in line with the preliminarily master plan.

Bhachau has been devastated as if there were previously nothing. A city master plan is being developed by GOG. with a local consulting firm.

Bhuj was not completely destroyed but various basic urban infrastructures are observed to be in a mess and a city plan has been prepared by GOG also with a local consultant. .

The studies for the two cities will be an important base for the rebuilding plan of educational and healthcare facilities as social infrastructure.

Bhachau taluka (county) has been completely destroyed by the earthquake. It is at the cross point of the highway from Ahmedabad to Gandhidaham with a local road to Bhuj. The county, taluka, has 71 villages and the population is 120,439 according to the population census of 2001. The population of the city (municipality) was around 30,000 at the day of the disaster, but the exact number is not sure according to the confusion of those days. New city planning is to be carried out based on the assumption the population will be 50,000 at 2010. The concept of the new structure of the city is as shown in the figure below. Three major methodologies are to be adopted; Dual Core System: New structure of whole city: Participation Progress Programme.

For planning 6 principle concepts are adopted for the town planning; Establishing proper connectivity between different localities: Conformity of land use: Qualitative infrastructure design considering topographic aspects: Provision of adequate and accessible social infrastructure facilities: public safety, during any kind of hazard: Natural drainage system and water bodies to be preserved.

Characteristics of this town planning is particularly important for the old town to preserve the religious spaces: to preserve the neighborhoods: to preserve the character of the main bazaar road and to reflect that the people are against land acquisition

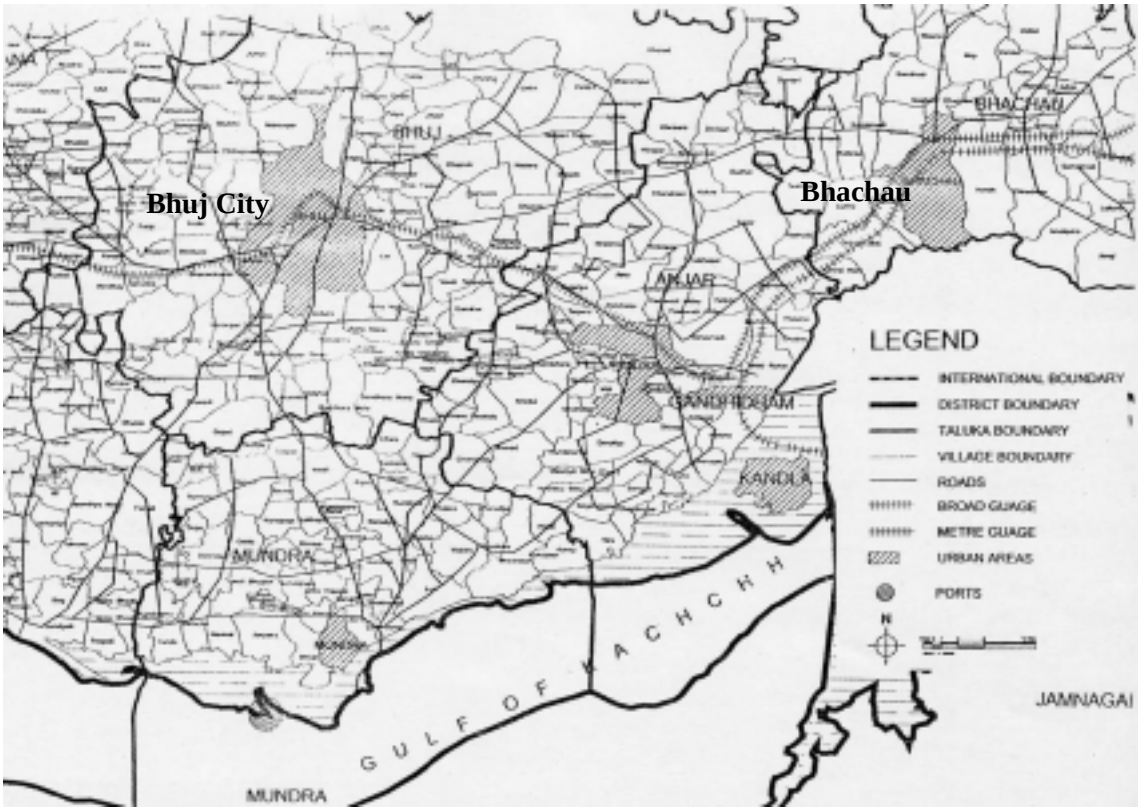


Fig.-4-19 Cities in Kutch

Fig.-4-20 Conceptual Development Plan, Bhachau 2011 (D. C. & E)

D.C. & E Inc.; Dalal Consultants And Engineers Limited

Bhuj has been planned by GOG together with the Environmental Planning Collaborative in Ahmedabad in a plan titled ‘Conceptual Development Plan, Bhuj 2011’. 32% of the urban population of Kutch is in Bhuj. As the administrative and commercial core of Kutch District, Bhuj will grow faster than other cities in the district supported by the industries with south shore ports. Bhuj is a historic city once being the capital of Kutch in 1545 AD. The walled city had fort walls built in 1732 AD. The population in the urban area is now 124,000. The population of Bhuj Municipality is 117,256. Relocation and rehabilitation are the major subject of the planning concept.

The main methodology of the master plan is to use land use zoning. The objectives of the methodology are to regulate development in the urban agglomeration of Bhuj, to keep land prices in check, to enhance efficiency & liveability in the urban area, to support and facilitate economic development, to reduce inequities in the spatial distribution of physical and social infrastructure, to effectively utilize government land, to enhance the aesthetic character and to enhance ground water recharge & improve environmental quality. The Zonings are set as follows; Zoning by sectors based on existing and proposed built form characteristics: Zoning boundaries to follow existing roads, proposed roads, principal physical features or at a fixed distance from any of the above: Water bodies, green spaces, heritage precincts and urban design zones which are strictly limited to further specific development: High density towards the center and along the major transportation corridors.

For the transportation infrastructure concept, the master plan proposes a new concept of roads; Ring roads: Strengthening radials: Developing new radials: Development of a grid of 18 m roads: Higher density zones along transport corridors: Delineate bus routes: shift ST bus stands: Implement proposed bypasses. By using these concepts and methodology the master planning is being set up for the restoration framework of the devastated city.

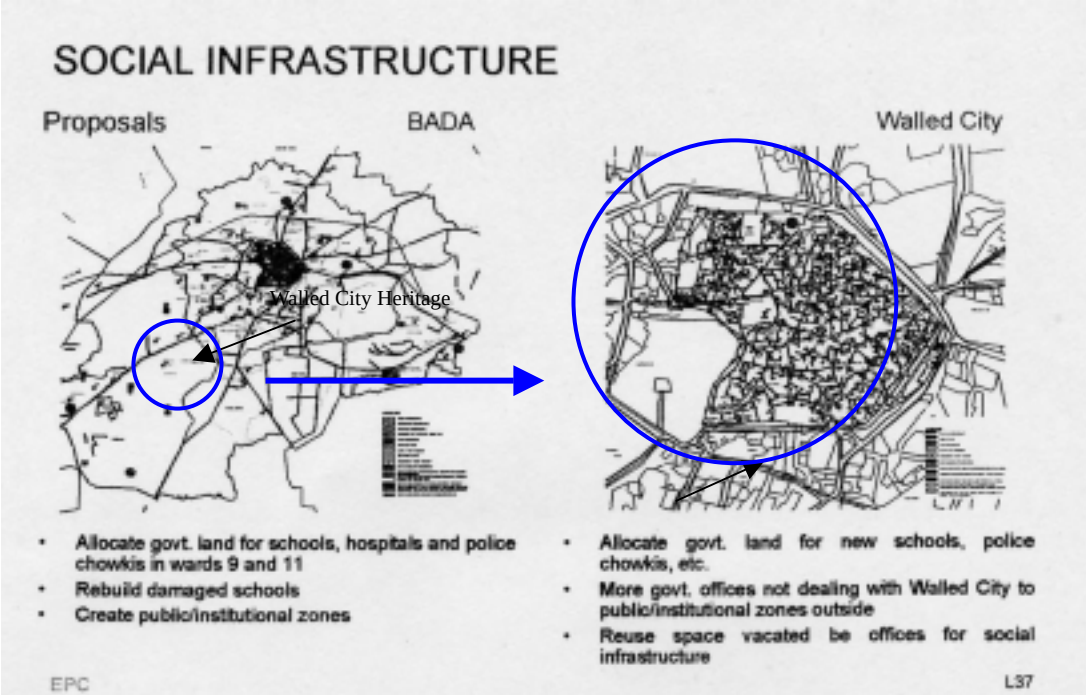


Fig.-4-21 Conceptual Development Plan, Bhuj 2011 (EPC)

EPC; Environmental Planning Collaborative

4.6 Rebuilding Plan for Potential Continuation of Assistance

According to the Scope of Works for the Reconstruction Support for the Gujarat-earthquake Disaster in the Affected Areas in India, the Project Team submitted an inception report to the GOG/GOI whose contents was basically agreed upon. The Project Team implemented the QRS project、which was the reconstruction of 5 primary schools and 2 CHCs, and simultaneously studied the Rebuilding Plan for educational and heathcare facilities (target year 2003) in cooperation with the GOG's officials concerned. The Project Team tried to formulate the Rebuilding Plan and had meetings with the officials concerned in order to find the needs and possibilities for the potential projects.

(1) Introduction

As a preparatory study for the Rebuilding Plan the Project Team studied the possibilities of further supports for the devastated educational and healthcare facilities.

The Project Team implemented the QRS project in Kutch District as reported in other sections. The schools and CHCs were completed, in accordance with the implementing programme in the Inception Report. The officals concerned and the Project Team discussed about the needs of further support through the meetings for the reconstruciotn of the primary schools and CHCs.

There were many, important and drastically damaged technical education institutions in Bhuj, so that the technical educational sector was independently studied as a part of the Rebuilding Plan. During the discussions with the officials the needs for community training was also brought up and included in the Rebuilding Plan in order to enhance people's preparedness for possible future disasters.

(2) Outline of Potential Projects

There are four categories for the study of the Rebuilding Plan:

1) Primary Education Sector
2) Technical Education Sector
3) Basic Healthcare Sector
4) Community Training

The Directorates and the Commissionerate made their utmost effort to help implement the reconstruction projects utilizing the help of NGOs and WB/ADB loans or the GOG/GOI budget. However on account of the financial shortage of the GOG/GOI the Directorates and Commissionerate have come to recognize the difficulty for the realization of its target to completely restore the educational and healthcare infrastructures by the year 2003.

1) Primary Educational Sector

For the primary educational sector two projects are studied as listed as follows in an order of the priority of the projects:

Table-4-10 Potential Projects in Primary Educational Sector

No.	Project	Areas in ha	Periodical Term	Completion
1	Supply of Equipment/Materials for the QRS project (1) I.T. equipment (5 Nos. of computers & UPSs and a printer per school) (2) Equipment for physical education (3) Drinking water facilities (4) A teachers' room cum library, teaching material store, etc. (5) Low height desks for children (sufficient height for sitting poison on the floor)	0.18	Short	2002
2	Constructin of more classrooms	0.18	Short	2002

2) Technical Educational Sector

For the technical educational sector four projects are studied as listed as follows in an order of the priority of the projects:

Table-4-11 Potential Projects in Technical Education Sector

No.	Institution	Area in ha.	Periodical Term	Completion
1	Institute of Seismology, Bhuj	1.56	Medium	2003
2	Engineering College, Bhuj	5.44	Long	2006
3	Vocational Training Centre, Bhuj	0.20	Short	2002
4	Pharmacy College, Lakhtar	5.40	Long	2006

In order for the improvement of human resources development and effective use of the facilities to be rebuilt the needs of technical knowledge/skill transfer along with the reconstruction of each institute was also strongly expressed.

3) Basic Healthcare Sector

For the basic healthcare sector one package project is studied as shown below:

Table-4-12 Contents of A Package Project in Basic Healthcare Sector

No.	Item	Areas in ha	Periodical Term	Completion
1	Mental Care and Rehabilitation Centre at Bhuj	Not Fixed	Short	2003
2	Expansion of Anjar CHC			
3	Regional Logistic Medical Store Centre at Bhuj			
4	6 PHCs including Staff Quarters (7units) in each PHC			
5	5 Allopathic Dispensaries with Staff Quarters (5 units) in each Dispensary and 3 Sub-centres			

4) Community Training

Exploration of possibilities of participationg in long term disaster management capacity building of communities through community trainigs 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.

There may well be one-by-one series base cooperation, parallel simultaneous base cooperation and comprehensive multi-complex base cooperation to cope with the needs in those three sectors.
It should be understood that, in this stage, the scope of works and terms of reference have not been fixed yet so that all the items are approximate and uncertain figures.
It should also be understood that every project and its scope of work is subject to further discussions and studies by both the GOG/GOI and the GOJ whether to be adopted as JICA assistance programmes.

(3) Implementing Procedures of JICA Assistance Programme

As a typical implementation schedule of the support, the following figures give a rough outline of the implementing process for the short, medium and long term JICA Grant Aid Projects based on project experiences in India and other countries:

The Project includes not only implementation of the QRS project but also research and formation of the Rebuilding Plan so that a project finding study, which will require some additional time before the implementation of the Rebuilding Plan if the whole or a part of the Rebuilding Plan were to be carried out, may not be necessary.

In long term projects the Project-Type Technical Cooperation may be adopted simultaneously which takes approximately 5 years.

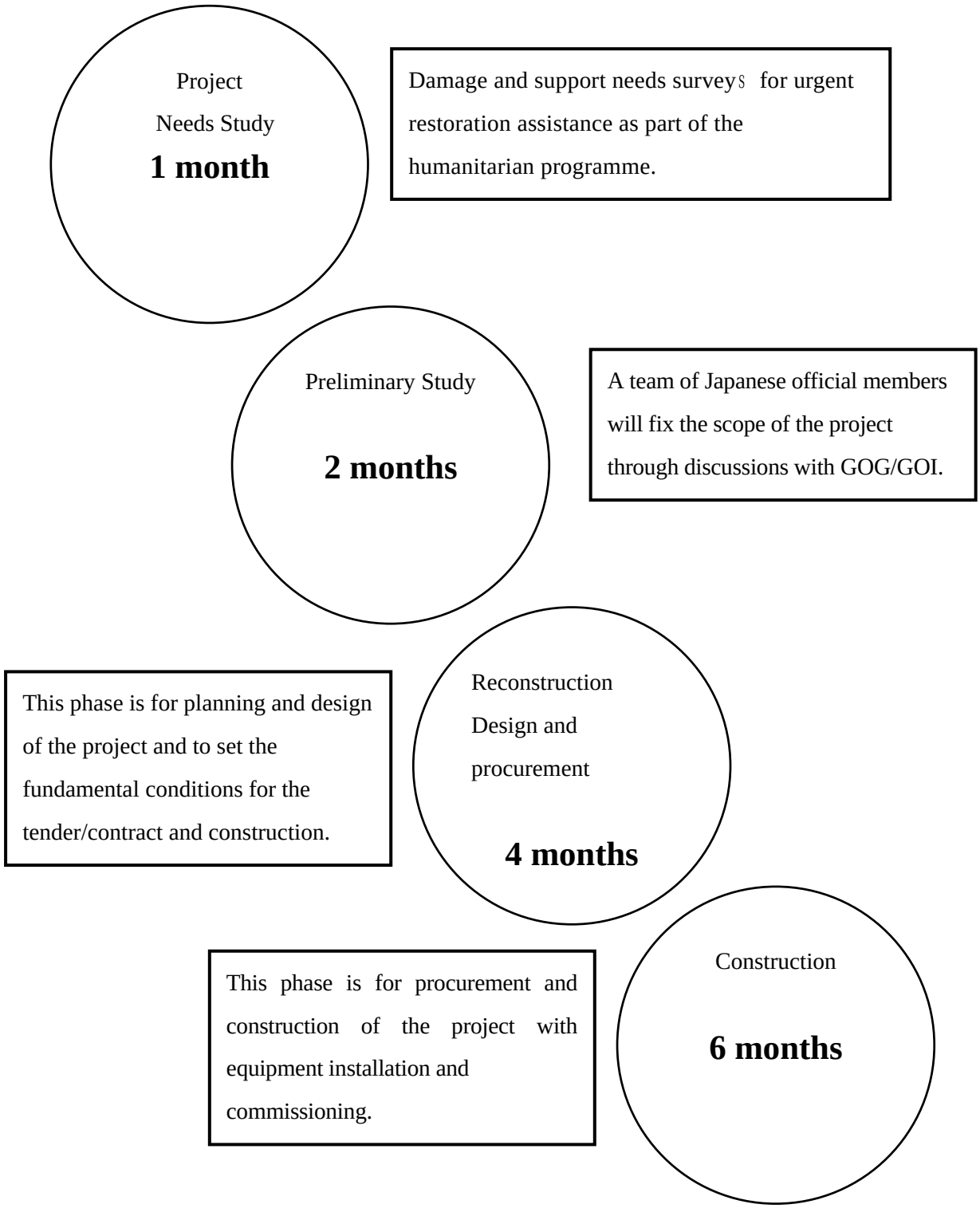


Fig.-4-22 Short Term Project

Based on the Ongoing Support Projects

SHORTEST 24 MONTHS

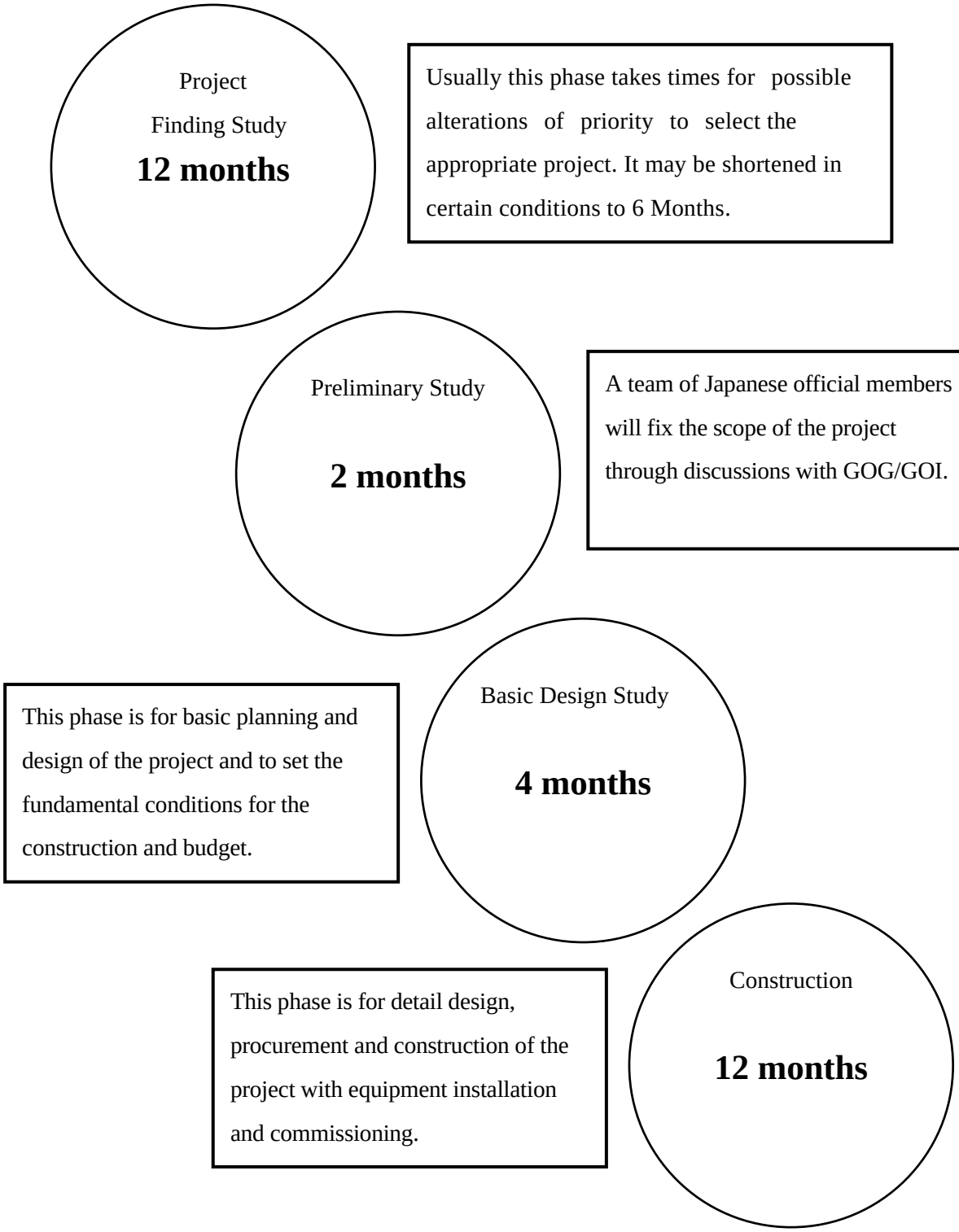


Fig.-4-23 Medium Term Project

Based on the Ongoing Support Projects

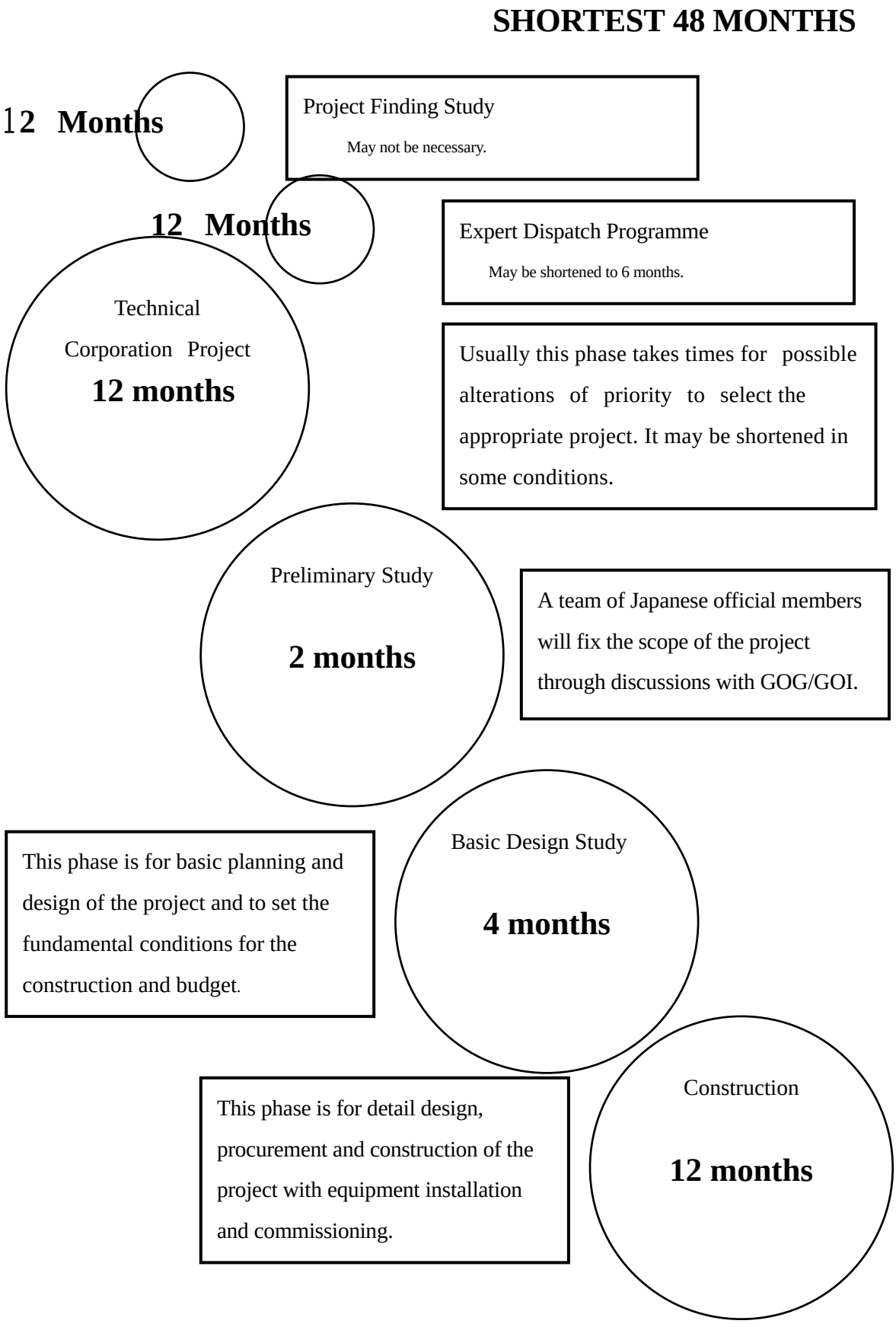


Fig.-4-24 Long Term Project Based on a project in other country

4.6.1 Primary Educational Sector

(1) Summary of Studies

Almost 90 % of classrooms in Kutch District collapsed or were damaged by the earthquake. Teaching in the area has been utilizing the tents or temporary facilities mainly provided by NGOs/international agencies. The DPEP has been making its utmost effort to help implement the reconstruction project by utilizing the help of NGOs and WB/ADB loan or the GOG/GOI budget. However, on account of the financial shortage of the GOG/GOI, DPEP has come to recognize the difficulties for the realization of its target to completely restore the primary education infrastructure by 2003. The potential projects to be studied are figured out below in an order of the priority of the needs.

Table-4-13 Potential Projects in Primary Educational Sector in Detail

No.	Project	Areas in ha.	Periodical Term	Completion	Comments
1	Equipment/Materials supply for the Project and others	0.18	Short	2002	Very urgent needs
2	More classrooms	0.18	Short	2002	Basic needs

There may well be one-by-one base cooperation or parallel base cooperation as the GOG intends to be supported as many projects as possible.

(2) Outline of the Potential Projects

1) Short Term Cooperation Project for Primary Education Sector

(a) Equipment Materials Supply for Classrooms of the Project and others

The QRS project for this sector made 35 classrooms for 5 primary schools with sanitary units and fences to cope with the urgent needs for restoration of the primary education infrastructure.

The GOG and some NGOs started providing computers, UPSs, printers and other peripherals to some of the primary schools in the State though the aoumt was not sufficient to cover all the primary schools in the State.

This support may be provided not only to the primary schools of the QRS project but also to surrounding other schools.

As one of short-term potential continuation of support, the computer equipment/materials and resources supply with instructing manpower for some time will work as a follow-up action to be evaluated and granted.

(b) More Classrooms

As reported in **3.2**, 23,731 classrooms have been damaged in which 6,698 classrooms have been collapsed. From that, as a press release (The Indian Express, July 23rd, 2001), 6,298 classrooms had been adopted by 64 NGOs and agencies as of July 23rd, 2001. 40 of 64 organizations adopted 1,720 classrooms with 100% support and the rest with 50% support. However the number of classrooms already started construction were only 800 and only 150 of them had been completed at the time.

To cope with the situation the GOG has been striving to set up of a construction managing cell with hundreds of personnel and quite recently the Kutch District has established a steering committee to have meetings twice a month under the Collector to vitalize and coordinate the confusing reconstruction of classrooms.

It is understandable that the rebuilding support of more classrooms might be significant and meet the crucial needs of the affected communities, but a primary educational facility is fundamentally a core of a community which should be committed, supported and anticipated by the rural people who have some historical vestiges as hierarchical social structures of caste and tribe so that the methodology of classroom-making needs grass-root type continuous and comprehensive workshops and negotiations/conversations with the rural community just like in the village-making methodology as mentioned in 4.2 2) as the Village Partnership Procedure Manual.

It basically takes quite a lot of time and voluntary manpower to cope with the complicated anticipatory methodology of school making.

Unsuccessful NGOs efforts might come not from their negligence but from the complication of the above-mentioned problems despite their diligence.

4.6.2 Technical Educational Sector

According to the preparatory studies by the Project Team for the Rebuilding Plan of the technical educational sector in Gujarat, there is a need for the re-establishment of the whole technical educational facilities in Bhuj based on a proposal prepared by the Directorate of Technical Education, Ministry of Education, the GOG.

1) Summary of Studies

The technical educational facilities in Bhuj were completely destroyed by the earthquake. The teachers and students have been using temporary facilities and other non-affected facilities in some other districts. The directorate has been making its utmost effort to implement the restoration projects by using the WB/ADB loans or the GOG/GOI budget. However, on account of WB/ADB policy not to support the advancement of academic programmes, but only to support restoration of urgent needs and the financial difficulties of the GOG/GOI. The Directorate has been studying the possibility of foreign support for the realization of its proposal shown below which are made in an order of the priority of the needs:

Table-4-14 Potential Projects in Technical Education Sector in Detail

No.	Institution	Area in ha.	Periodical Term	Completion	Others
1	Institute of Seismology, Bhuj	1.56	Medium	2003	Included in 2
2	Engineering College, Bhuj	5.44	Long	2006	Completely destroyed
3	Vocational Training Centre, Bhuj	0.20	Short	2004	Utilization of 2
4	Pharmacy College, Lakhtar	5.40	Long	2006	Future

There may well be one-by-one base cooperation or parallel base cooperation as the GOG intends to be supported as many projects as possible. If the comprehensive educational complex be realized in one compound in Bhuj as one of the Center of Excellence in Gujarat, including the Institute of Seismology and Engineering College with close relation to the Vocational Training Centre, the technical educational environment of the affected area will be prominently advanced to help vitalize the industries with its enhanced manpower supply and sophisticated technology research/development.

2) Outline of Potential Projects

1) Short Term Cooperation

The Rebuilding Plan shall be for the potential projects to be completed by 2003, according to the Scope of Work agreed between the GOG and JICA on April 26, 2001. The potential projects

may start after the completion of the QRS project, so that the available period may be 2 years from July 2002 to April 2004. The short-term implementation system might be the same as the QRS project and the budgetary scale also might be approximately the same. Consequently the short-term project will be completed by 2003. The Project Team had discussions with the concerned GOG officials and came to an understanding that the Short Term Cooperation for the technical education will be for the Government Vocational Training Centre, Madhapur, Kutch, and 6 km south of Bhuj.

(a) Vocational Training Centre

The Government Vocational Training Centre, Madhapur, Bhuj was started under Central Government Assistance through the Directorate of Technical Education from the year 1992. The Centre was run in a rented house of Saraswati Vidyarawa Campus at Madhapur Navavas. In September 2000 a new building for the Centre was completed. A number of educational facilities collapsed due to the earthquake including the Government run academic, residential and administrative buildings and aided engineering colleges, polytechnics, pharmacy colleges and technical high schools. The Government Vocational Training Centre, Bhuj was totally destroyed. All machinery, equipment, furniture, books etc. were buried under the debris.

Fig.-4-25 Government Vocational Training Centre

① Pre-Earthquake Status

Academic programmes conducted at the time of the earthquake was:

Table-4-15 Pre-earthquake Status of Vocational Training Centre

No.	Name of Courses	Intake
1	Home Electrical Appliance	25
2	Engineering Sketching, Drawing, Drafting	25
	Total	**50**

② Academic Plan

In order to restart the academic activities, all academic, administrative and residential facilities have to be reconstructed with all infrastructures and equipment in the existing premises. The Academic Plan expected in the revitalized institute will be:

a. Annual Intake: 4 courses, 25 per course, total 100

b. Total Strength: 300

c. Programme Duration: Three years

d. Courses:

- Engineering, Sketching, Drawing & Drafting
- Home Electrical Appliance & Wiring
- Certificate in Secretarial Assistace (I.T.)
- Certificate course in web-operater

e. Teaching Staff:

Principal	1
Assistant lecturer	2
Junior lecturer	2
Trade Instructor	1
Store Keeper	1
Total	7

f. Supporting Staff:

Junior Clerk	2
Hamal	3
Chopwkidar	1
Peon	2
Total	8

③ Facilities and Equipment

Facilities will be as follows:

Table-4-16 Facilities/Equipment of Vocational Training Centre

No.	Instruction Area	Area, m × m	Carpet Area in m²
A	Academic Area		
1	Class Room	5 × 66	330
2	Laboratory / Workshop	4 × 88	332
3	Library / Learning laboratory	1 × 88	88
4	Computer Centre	1 × 66	66
5	Faculty Room	1 × 66	66
6	Reprography Centre	1 × 22	22
7	Ladies Room	1 × 22	22
8	Boys Room	1 × 22	22
9	PH Room	1 × 11	11
	Total A		959
B	Administrative Area		
1	Principal's Office	1 × 22	22
2	Confidential Room	1 × 11	11
3	Establishment	1 × 66	66
4	Central Store	1 × 66	66
	Total B		165
C	Residential Area		
1	Principal Area	1 × 100	100
2	Class III	2 × 50	100
3	Class IV	2 ×30	60
	Total C		260
D	Passage, toilet, ramp, lift, central opening, etc.	1 × 150	150
	Total D		150
	Total A+B+C+D		**1,534**

Built-up area = Carpet Area × 1.4 = 1,534 m² × 1.4 = 2,148 m²

Equipment will be as follows:

Table-4-17 Equipment of Vocational Training Centre

No.	Items
1	Furniture
2	Equipment, books, language laboratory, etc.
3	Initial Consumables and maintenance facilities

④ Implementation Schedule

Original expected implementation schedule was:

Table-4-18 Original Schedule of Vocational Training Centre

No.	Activities	Period
1	Approval of project	May - June, 2002
2	Consultant Identification	15 June - 15 July, 2002
3	Tender Invitation	16 July - 16 August, 2002
4	Contractor Awarding	17 August - 30 August, 2002
5	Execution of works	5 September, 2001- June, 2003
6	Tender for equipment	March, 02 - 15, 2003
7	Commissioning of equipment	May, 02 - June, 2003
8	Starting of academic activities	June 16, 2003

Alteration of the academic annual schedule is an important matter and should be in line with the educational annual plan of the GOG. It should not be discussed before a mutual understanding of the GOG and GOI with the GOJ is achieved.

2) Medium-term corporation

Medium-term Cooperation will be for the projects not necessarily completed within the target year 2003 to utilize the JICA Grant Aid official development assistance or some other programmes. A prerequisite for the utilization of JICA Grant Aid Programme is to conform mutual agreement of the GOI and the GOJ, which usually takes the figure of Exchange of Notes by both countries. A request from the GOG to the GOI be inevitable and consequently the GOI request on behalf of the GOG to the GOJ for the implementation of the Grant for the project. To study the detailed requirements and situation and/or circumstances the GOJ will dispatch a technical cooperation team with the GOJ officials and specialists who will assist the activities in the project before and after completion. Successively a basic design study team will be dispatched to finalize the scope of works and schematic plan of the project. Based on all those procedures the GOJ will be able to finalize the budgetary measure. Accordingly it will take 3-4 years for the completion of the project. The projects referred to as in the following report may take 3-4 years and a lot of funding might be necessary, so that it would be recommendable to utilize the JICA system for the Medium term corporation. A potential project fit in the Medium-term corporation is the Institute of Seismology Research.

(a) Institute of Seismology, Bhuj

① Background

One of the most important functions of this Institute is to save as many lives as possible at the time of the strong earthquake. The recent concept of disaster prevention measure is to set up the know how to deal with disasters by studying not only earthquake as physical disastrous phenomenon to be predicted as precisely as possible but also as social devastating phenomenon to be carefully prepared, strongly resisted, and rapidly restored.

The Institute is to be designed to help efficiently minimize damages at any stage of the phenomenon in terms of prediction, preparation、resistance and restoration, so as to be a Center of Excellence in this country and in the world as well. In line with this context a national network of devices of existing or planned ground motion observation stations for the observation of strong ground motion is to be provided in order to determine epicenter locations、magnitude and seismic intensities. As reported in other sections in this report, there are a lot of plans that have been proposed by various sectors such as:

- National Disaster Control Center proposed by GSDMA in Gujarat is being planned as in 4.2 section of this report
- Earthquake Risk Evaluation Center (EREC) by the India Meteorological Department will be set up by the end of 2001. (as reported in the Asian Age of August 22, 2001)
- Disaster Modeling Course in the proposed Government Engineering College、Bhuj as in 4.6.3 section of this report.

Many other projects might also be proposed and implemented by various sectors which will be nodal points of the network by using an internet linkage. The headquarters of comprehensive countermeasures for earthquake disasters to serve as a disaster prevention center in an emergency may be established in GSDMA as the National Disaster Control Center supported by this Institute to collect accurate information on the devastation of the earthquake-hit areas in terms of the above mentioned items and estimate the degree of overall damage in a short time by using up-to-date methods and equipment developed in the Institute. There is the threat of so called “Great Himalayan Earthquake” to have a power to

kill more than 200,000 people with its strain having been built up since 1700 AD as potential energy when it hits some Mega-City in the Ganges plain predicted by an Indo-American team of specialists. (The Indian Express of August 26, 2001)

So the establishment of this kind of institution is requisite to avoid future tragedies.

② Pre-earthquake status

Gujarat has no institutions or laboratories of Seismology to manage independent long-range scientific studies and mitigation programmes. India also has no National/Regional Institute of Seismology. Some departments of universities, the Meteorological Department, the Geological Survey of India, and the National Geophysical Research Institute have performed some limited research and development activities with nearly 50 professional seismologists. M.S. University, Vadodara, has also achieved some works in this area.

③ Academic Plan

By establishing the institute the GOG intends to set up the methodology of making comprehensive earthquake resistant structures in all Indian States, especially in Gujarat State having suffered from earthquake devastations so severely and so many times so far.

There is also the great fear of the possible 'Great Himalayan' killer earthquake which may force 50 million people at risk in India according to a report by the team of the University of Colorado and the Indian Institute of Astrophysics in Bangalore released in the press on August 26th 2001.

The Institute is to be established for academic activities to study earthquakes as a phenomenon to save as many lives as possible during a strong earthquake at its pre-earthquake, in-earthquake and post-earthquake situations and for setting up of methodologies on earthquake resistant and reconstructive urban and rural structures in terms of facilities and social infrastructures as well. As far as administrative matters are concerned, a center for managing disasters has already been established at GSDMA (Gujarat State Disaster Management Authority) in the GOG, and is doing its best to help restore the devastation of the affected areas by the Republic Day's earthquake so that the institute should focus its function only on academic activities accordingly. In line with this context

the Institute should have dual components, one is for seismology study and the other is for earthquake-resistant methodology study, in one compound as shown in the figure below.

Even though the studies on the prediction of earthquakes have been carried out through seismological, geophysical and geo-chemical points of views progressively, the methodology for predicting the coming epicenter spot and strength and pattern of the earthquake has not yet been successfully established.

Thus far the studies on the effect of strong earthquakes which hit large cities indicate 80% of the deaths caused by the earthquakes were crushed or suffocated to death squashed under buildings and furniture. 80% of those victims died within 6 hours after the earthquake, so that the focus of disaster preventive methodology has been gradually shifting from 'Prediction' to' Prevention'.

The Institute should function even after a killer Earthquake, so all or some buildings of the institute must be a model of earthquake resistant structure and so may well be designed as base-isolated buildings which have been successfully developed in Japan.

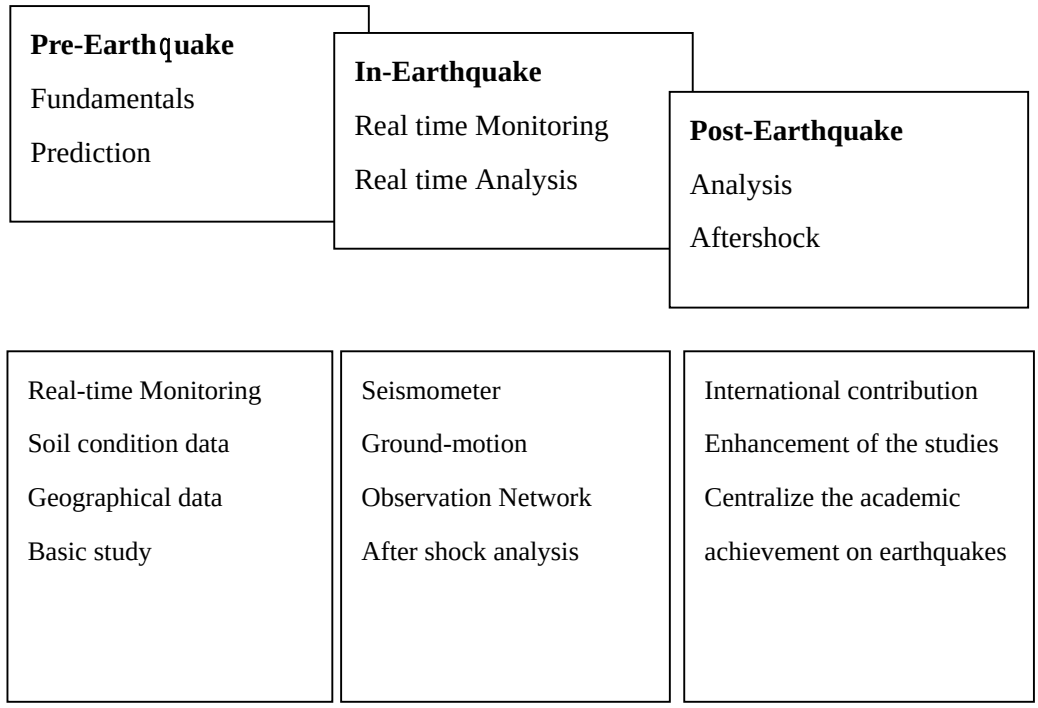


Fig.-4-26 Concept of the Institute of Seismology, Bhuj

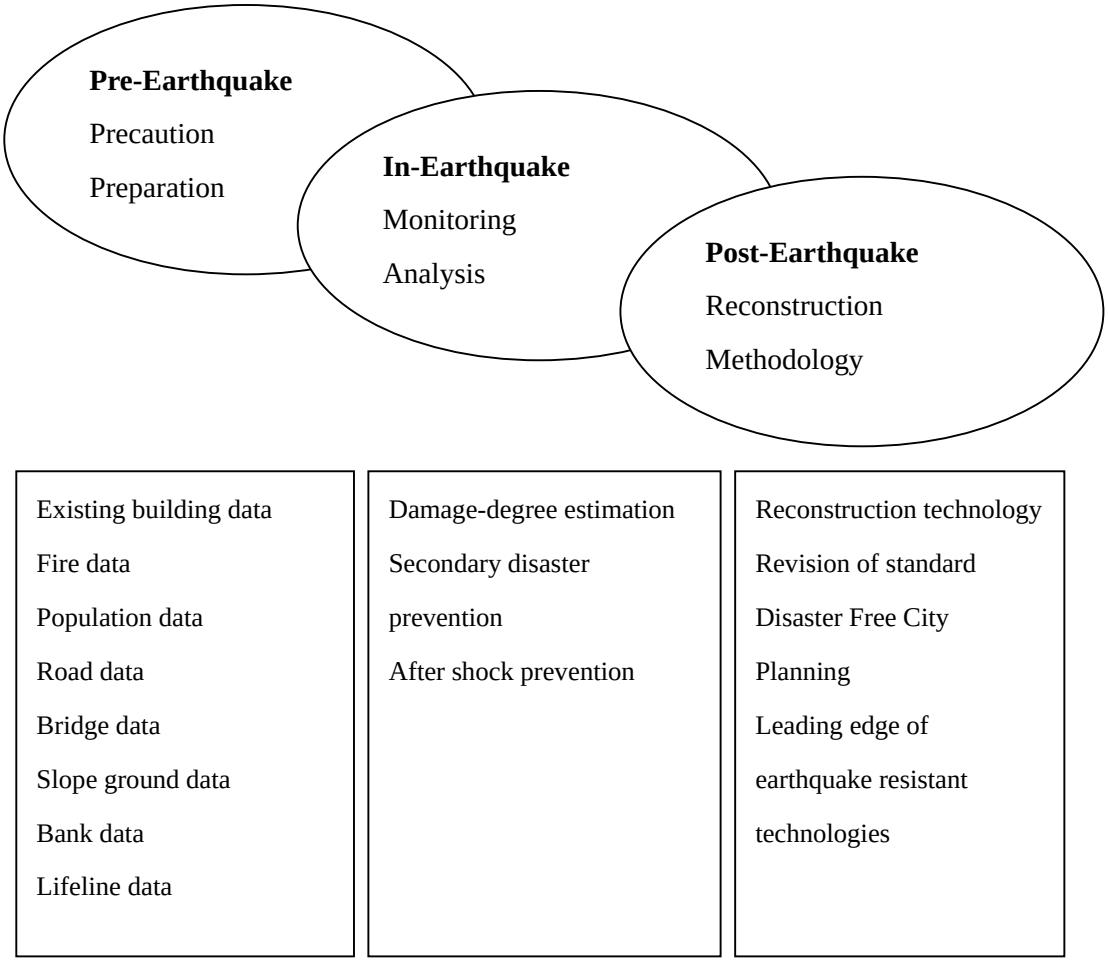


Fig.-4-27 Earthquake Resistant Methodology Study Component

This institution will be registered as a Society under the Gujarat Public Societies Registration Act and sponsored by GOI. Ownership will be retained by the GOG.

The Academic Plan of the Institute to be established will be at an International level and will be deemed university status. The Institute will have heavy-duty earthquake resistant buildings, laboratories, library, computer centers, staff quarters etc. and manage faculty recruitment, foreign training, visiting appointments, seismic observatory and others.

A full-scale institute will have the following centers:

a. Earthquake Prediction Centre
b. Earthquake Information Centre
c. Earthquake Mechanics and Technology Centre
d. Monitoring and Computerized Geo-science Centre
e. Global Geodynamics and Earthquake Modeling Centre
f. Disaster and Mitigation Science Centre

g. Earthquake Observation Network: Permanent and Mobile Units
h. Special Events Analysis Centre
i. International Progress and Visiting Centre

The following are the aims and objectives of this institute:

- To offer International level education and research on seismology
- Survey and study the solution of problems created by the disaster
- To study up-dated methods of planning, designing, constructing, and managing of efficient earthquake-resistant structures and facilities
- To supply information responding to the inquiries by government agencies, professional organizations and the general public
- To create awareness of earthquakes and earthquake hazards
- To provide training in earthquake and civil sciences to the students of the International community
- To reduce earthquake risk by developing the science and engineering, by improving the understanding of earthquake impact on the physical, socio-economical, political, and cultural environment by advocating comprehensive and practical measures studied here
- To offer continuing education programmes covering topics like the fundamentals of earthquake resistant design, evaluation of hazards and decision making systems, seismic retrofit, usage of strong motion data in design, and seismic risk analysis
- To conduct technical seminars emphasizing regional seismic issues in design, policy and implementation
- To coordinate for the investigative effort of several organizations in connection with earthquakes and earthquake hazards
- The need of earthquake design for structures has been well established on the following aspects:
  - To prevent non-structural damage under frequent minor ground shaking
  - To prevent structural damage and minimize non-structural damage in occasional moderate ground shaking
  - To avoid collapse or serious damage in rare major ground shaking

Programmes and activities were envisaged as follows but will be subject to amendment in

the future.

The institute was originally expected to start functioning from the academic year 2001-2002. The strength of the students was to be 360 in the year 2005-2006.

Details of courses offered:

Table-4-19 Courses of Institute of Seismology

No.	Programme/ Year	Duration in years	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006
1	Post doctorate Research	3	00	00	05	10	20
2	Doctorate Programme	3	05	05	05	10	20
3	Post graduate Programme	2	40	40	40	80	100
	Total		**45**	**45**	**50**	**100**	**140**

Staff allocation will be as follows:

Table-4-20 Staff of Institute of Seismology

No.	Categoriesof Staff	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006
A	Teaching Staff					
1	Professor	1	2	5	8	10
2	Readers	2	4	8	12	16
3	Assist. Professor	4	8	12	16	20
	Total	7	14	25	36	46
B	Supporting Staff	2	4	8	10	12
C	Administrative					
1		1	2	4	6	8
2		1	2	4	6	8
	Total	2	4	8	12	16
	Total (A+B+C)	**11**	**22**	**41**	**58**	**74**

④ Facilities and Equipment

Academic Core:

Table-4-21 Facilities of Institute of Seismology

No.	Units / Centre C.=Centre	Space m^2
1	Earthquake Prediction Research C.	350
2	Earthquake Information C.	200
3	Earthquake Mechanics & Engineering C	400
4	Monitor&Computerized Geo-Science C	400
5	Global Geodynamics & Modelling C.	250
6	Disaster & Mitigation Science C.	400
7	Earthquake Observation Network	400
8	Training Centre	400
9	Special Event Analysis C.	200
10	International Progress/Visiting Faculty C.	100
	Total	**3,100**

Administrative Core:

Table-4-22 Academic Core of Institute of Seismology

No.	Units / Centre C.=Centre	Space m^2
1	Director Office	500
2	Registrar Office	250
3	Student Section	500
	Total	**1,250**

Residential Core:

Table-4-23 Residential Core of Institute of Seismology

No.	Units / Centre C.=Centre	Space m^2
1	Hostel,150Boys,50girls	2,200
2	Director's House	300
3	Professor's	2,500
4	Assist. Professor's	4,000
5	Staff Quarters	1,500
6	Servant Quarters	300
7	Transit House	400
	Total	**11,200**

Total Implementation:

Table-4-24 Total Area of Institute of Seismology

No.	Units / Centre C.=Centre	Space m^2
1	Academic Core	3,100
2	Administrative Core	1,250
3	Residential Core	11,200
	Total	**15,550**

Implementation of the Project is to be in connection with overseas institutions such as the Earthquake Research Institute, USA; Earthquake Research Institute, Tokyo; Earthquake Engineering Department, University of California; Center for Earthquake Research and Information, USA; and Seismological Observatory of KOERI, Turkey.

Finding out of appropriate assistance programmes will be an important breakthrough for starting the Project.

⑤ Japanese Seismology Research Organizations

As a country prone to frequent earthquakes, Japan has a lot of seismology research organizations as listed here:

Table-4-25 Japanese Seismology Institutions

No.	Organization
1	Tokyo Daigaku Jishin Kenkyusho (Earthquake Research Institute of Tokyo University)
2	Kenchiku Kenkusho (Building Research Institute, MOLIT)
3	Bosaikagakugijutsu Kenkyusho (EDM) (Earthquake Disaster Mitigation Research center, MOES)
4	Chishitsu Chyousa Kenkyu Suishin Honbu (Soil research deployment center, Cabinet Headquarters)
5	Kishyocho Jishin Kazan kenkyubu (Earthquake and Volcano Research Division, AOM)
6	Shizuokaken Jishin Bosai Kenkyusho (Earthquake Disaster Management Center of GOS)

MOLIT = Ministry of Land, Infrastructure and Transportation. AOM = Agency of Meteorology.
MOES = Ministry of Education and Science. GOS = Government of Shizuoka Prefecture

The institutions listed are not yet nominated to be committed to the potential project, therefore the Web-Sites are available only for reference to get the information of their organizations, activities and so on.

The societies concerned are Architectural Institute of Japan (AIJ) and Japan Society of Civil Engineers (JSCE) and both Societies have already dispatched study teams and carried out their studies as shown in the following table below:

Table-4-26 Japanese Survey Teams for the Bhuj Earthquake

No.	Society	Member	Theme
1	JSA	Shunsuke Otani, Professor, The University of Tokyo Takumi Toshinawa, Associate Professor, Meisei Univ. Arai horoshi, Research Engineer, EDM Yoshiaki Shimada, Associate Prof. Kogakuin Univ. Kimiro Meguro, Associate Prof. The University of Tokyo Hitomi Murakami, Associate Prof. Yamaguchi Univ. Ashwani Kumar, Prof. University of Roorkee Venkataranama, Associate Prof. Kagoshima Univ. Susumu Kono, Kyoto University Hitoshi Tanaka, Professor Kyoto University Fumiaki Uehara, the University of Tokyo Pradeep Kumar, Ph.D the University of Tokyo Y. Hayashi, Associate Prof.. Kyoto University Junji Sawada, Associate Prof. Kyoto University. Sanjay Pareek, Dr.Eng. Nihon University Norio Maki, Dr.Eng. EDM Syu Yamane, Shiga Pref. University Mio Minoru, As.Prof. Toyo Eiwa Jogakuin Univ.	1. The 2001 Gujarat earthquake and Resulting Ground Damage 2. Outline of Damage 3. Micro-seismic Intensity Survey deduced from Building Damage 4. Estimation of MSK Seismic Intensity by Questionnaire Method 5. Damage of Reinforced Structure 6. Damage to Masonry Structure 7. Building Damage in Gangidham 8. Building Provisions in India 9. A Survey on Repaire Human Casuality and Emergency Responce
2	JSCE	Ömer Aydan, Tokai University Ikuo Tohata, the University of Tokyo Tsuyoshi Honda, the University of Tokyo S.K.Prasad, Sri Jachamagendra Institute of Eng. G.P.Chandradara, S.J. Institute of Engineering Junji Seino, Kyoto University	1. Geological, Seismo-tectonics, Faulting and Ground Motion Aspects of the Kutch earthquake of January 26, 2001 2. Soil Engineering Study on 2001 Indo-Gujarat earthquake Damage Report of 2001 West-India Earthquake

3) Long-term Cooperation

Long-term Cooperation will be for the long, large and complicated projects.

The long-term cooperation is the most effective support programme to set up of the basic social infrastructure for the disaster affected areas

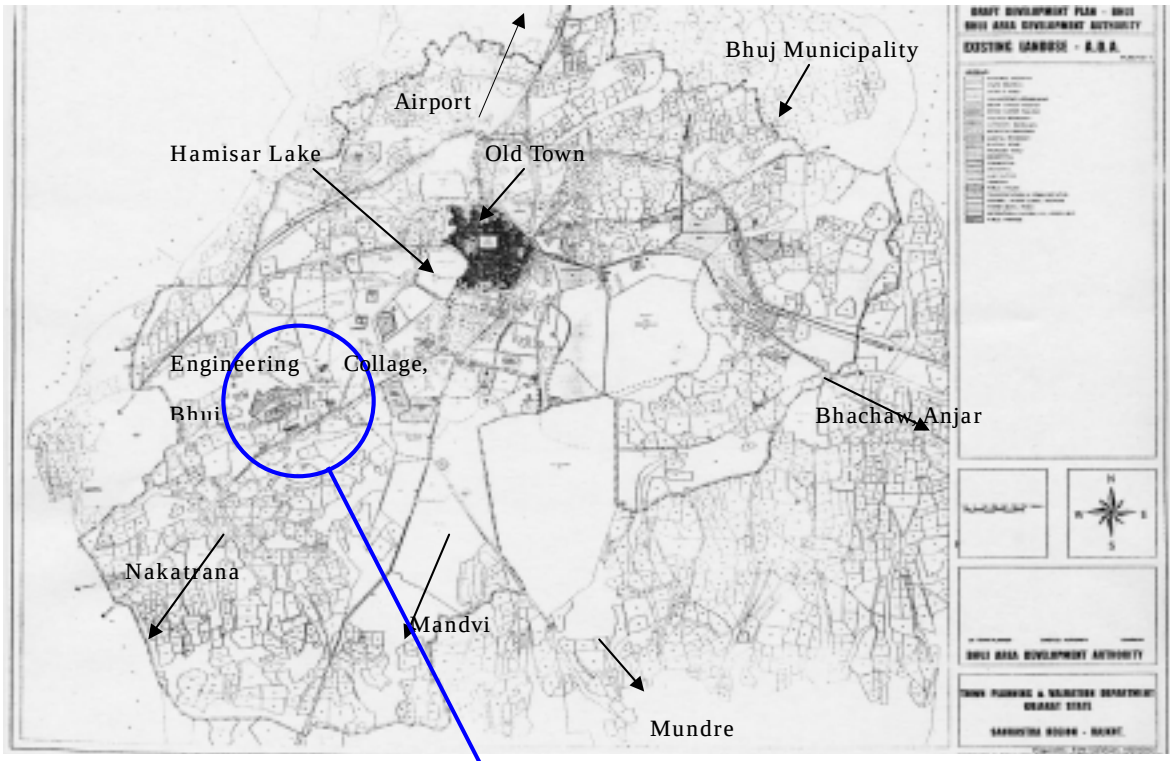


Fig.-4-28 Map of Bhuj

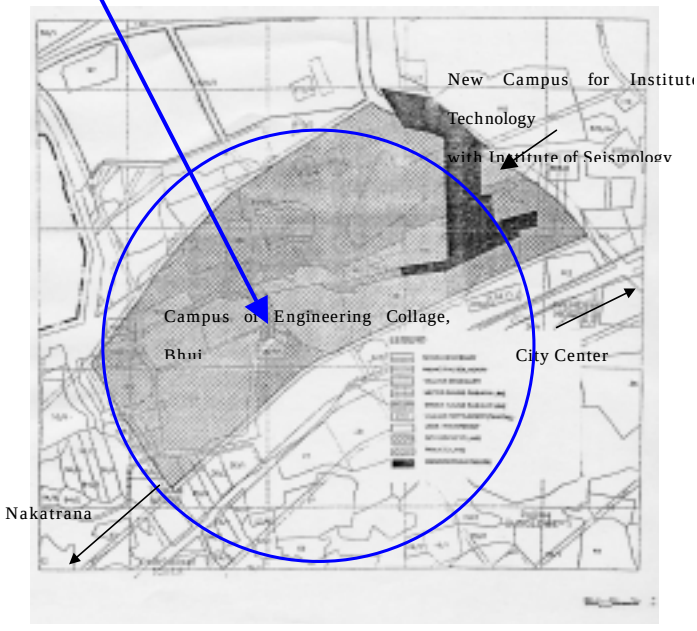


Fig.-4-29 Map of Campus

(a) Engineering College, Bhuj

The Engineering College was established by the GOG in September 1994 offering degree courses in Mechanical Engineering and Electrical Engineering with an intake of 60 in each course. The institute started its academic activities by sharing functioning facilities of the Government Polytechnic, Bhuj and recent student average performance of the institute in final year examinations held by Gujarat University is of the order of 92 % to 96 %.

The State Government has acquired 28.81 acres of land for this institute as shown in Fig.4-12. Construction of 4 classrooms was in progress.

In the earthquake of January 26, 2001, its facilities were damaged to the extent not to be able to run the campus for academic activities.

Therefore the GOG is planning the Re-Establishment of the institute as a high-tech institute offering degree courses of advanced technology in addition to the conventional degree courses of Mechanical and Electrical Engineering.

Looking to present and future needs, it is aimed to re-establish this institute with the following additional undergraduate courses with the intake shown below:

Table-4-27 New Courses of Engineering College, Bhuj

No.	Courses	Seats
1	Electronics & Communication Engineering	60 Seats
2	Computer Engineering	60 Seats
3	Mechatronics	60 Seats
4	Information Technology	60 Seats
	Total	**240 Seats**

① Background

The main objectives of this institute are:

- To create a centre of excellence for providing knowledge, education, and training facilities of a high order in the field of science and technology and other professional areas as per current status and other such matters as may develop in the future.
- To develop different patterns of teaching at undergraduate and postgraduate level.
- To get a high standard of education.
- To develop a Training facility in higher education including professional education and allied fields.

- To develop a learning resources center
- To prepare the students for the new millennium where they may have an all pervasive impact on human life.
- To contribute to India's growth aspirations which can magnified many folds as wealth creation is happening at a faster pace.

② Academic Plan

The curriculum and syllabus has been already prepared by the institute and a subsequent spatial requirement has been listed up for the re-establishment.

The Basic concept of the academic plan is as follows:

Each semester will be of 18 weeks providing 90 net academic contact days. The holidays will be utilized for co-curricular, extra curricular activities and the development of physical and mental strength among the students.

The contact hours per week will be as per the teaching scheme prescribed by the institute.

Periodic assessment, assignment, and quizzes will be the usual features for ensuring structured learning.

The vacation will be utilized for industrial training or for related educational programmes.

- To develop techno-economics environment awareness and ample guided visits to industries will be arranged to develop a feel of the world of work and a better understanding during the study.
- Self-learning is the best method for a devoted student, and to provide self learning, a library, a Computer Centre with internet and Learning Resource Centre facilities will be provided and these places will be open from early morning to late night. Moreover computer facilities will be made available in hostels for working in odd hours.
- The student will also be trained in the area of national concern like the conservation of natural resources, protection of environment, safety, ethics, social responsibility & self-discipline through brain storming sessions, seminar, workshops, group discussions and interaction with experts in these fields.
- Special coaching will be arranged for students of weaker sections. Moreover special coaching will be arranged for all in the area of communication skills, computers and other areas as requested by the students to help those who are not trained in English medium schools or did not have the opportunity to train themselves in the above areas. A language

laboratory will also be established which will also provide opportunity for training for competitive examinations.

- To make the students aware of emerging technologies and professional skill in group working, behavioral science, industrial psychology, economics, finance, entrepreneurship development, engineering skills, marketing management, etc. group discussion, seminars and symposiums will be arranged.
- Student center activities like the ISTE Student Chapter, Wall Magazine, exhibitions arranged by students, student centered seminars, talks,competitions, and discussions etc. will be encouraged.

A Campus Master Plan will be structured in line with the concept of the Academic Plan which will have 4 functional cores:

Academic Core, for Technical Education
Autonomy Core, for Programme development
Industrial Interaction Core, for Industrial Education
Continuing Education Core, for Life Long Education

Facilities and Equipment are to be as in the table bellow:

Table-4-28 Facilities of Engineering College, Bhuj

No.	Facilities	Academic Core	Autonomy Core	Industrial Interaction Core	Continuing Education Core	Grand Total	Total ×1.4
1	Facilities in m^2	36,965	760	220	548	38,493	53,890

③ Details of Facilities and Equipment

The following are required:
Academic Core
Facilities:

Table-4-29 Academic Core Facilities of Engineering College, Bhuj

No.	Utility Area	Carpet Area ㎡
1	Instruction Area	9,960
2	Administrative Area	1,545
3	Student Amenities	790
4	Residential Area	24670
	Total	36,965

Equipment/ Furniture:

Table-4-30 Academic Core Equipment of Engineering College, Bhuj

Furniture

No.	Item	Units
1	White boards	50
2	Classroom tables	50
3	Counters	4
4	Benches	400
5	Drawing tables	300
6	Stools	2000
7	CL. I tables	60
8	CL. I chairs	180
9	CL. II tables	100
10	CL. II chairs	150
11	CL. III tables	125
12	CL. III chairs	150
13	Laboratory tables	150
14	Computer tables	100
15	Computer chairs	200
16	Con. Room furniture	Set
17	Library furniture	Set
18	Res. furniture	160
19	Canteen furniture	Set
20	Hostel furniture	700
21	Dining Hall furniture	20
22	Guest house furniture	Set
	Total	

Equipment

No.	Item
1	Mechanics Laboratory
2	Material Testing & Strength of Material Laboratory
3	Mechanics Laboratory
4	Electrical Engineering Laboratory
5	Surveying & Civil Engineering Laboratory
6	Electronic Circuit Laboratory
7	Digital Laboratory
8	Microwave Devices Laboratory
9	Control System Laboratory
10	Communication Laboratory
11	Measurement Laboratory
12	Electric Machine Laboratory
13	Network Laboratory
14	Power Laboratory
15	High Voltage Laboratory
16	Switch Gear Laboratory
17	Microprocsessor Laboratory
18	Commissioning Laboratory
19	Energy Conversion Laboratory
20	Illumination Laboratory

No.	Item
21	Computer Laboratory
22	Computer Software Laboratory
23	Computer Hardware Laboratory
24	Heat engine Laboratory
25	Fluid Mechanic & Fluid Power Laboratory
26	Metrology & Instrumentation Laboratory
27	Refrigerating & Air Conditioning Laboratory
28	Kinematics & Dynamics of M/C Laboratory
29	CAD Laboratory
30	CAM Laboratory
31	Workshop
32	Control Engineering Laboratory 10.0
33	Alternate Energy Sources Laboratory
34	Automobile Engineering Laboratory
35	I.C. Engineering Laboratory
36	Heat & Mass Transfer Laboratory
37	Thermal Engineering Laboratory
38	Production, Operation & maintenance Laboratory
39	Project Laboratory
40	Mechatronics & Component Laboratory
41	Sensor & Robotics Laboratory
42	Library
43	Learning Resources Centre
44	Training & Placement Office

Autonomy Core

The Autonomy is a system to create and implement new ideas, new programmes and other new services as part of an overall thrust towards the attainment of excellence of the institution in different areas of activities.

The objectives of autonomy are to be:

- Design/modify curriculum or courses
- Use teaching methods as appropriate
- Decide methods of assessments
- Describe rules of admission as per AICTE regulations, subject to the reservation policy of the State Government.
- Evolve methods of evolution and to conduct examinations
- Set standards for quality and accountability

Facilities:

Table-4-31 Autonomy Core Facilities of Engineering College, Bhuj

No.	Space requirment	Carpet Area m^2
1	Controller of examinations Room	25
2	Room for register (Academic)	20
3	Office	100
4	Confidential Room	75
5	Conference / Central Assessment Room	150
6	Stationary Room	100
7	Record Room	200
8	Computer Centre	50
9	Registration Counter	40
	Total	760

Equipment:

Table-4-32 Autonomy Core Equipment of Engineering College, Bhuj

No.	Items
1	Furniture
2	Vehicle
3	Equipment

Industrial Interaction Core

The industrial development envisaged in Gujarat and to meet with the quality requirements of technical manpower, strong linkage with industries is requisite.

The main purposes of strengthening Industry Institute Interaction(I.I.I.) activities are to provide quality trained engineering graduates as per industries needs and to provide quality services by forming strong linkage with them to meet the challenges posed by globalization and the liberalization of economy.

Objectives of the Core are to be:

- To establish an Industries Institute Interaction Cell.
- To improve the quality of graduates by involving industries as partners in curriculum development, planning and implementation of education programmes and evaluation of students, evaluation of faculty exchange.
- To provide services like testing, consultancy, training, quality control programmes etc. to industrial personnel.
- To enhance quality of industrial personnel, faculty and students through effective linkage.
- To share resources of both, institute and industries, to improve the quality of their working.

- To share resources of both, institute and industries, in the form of improved services to be provided to the society.

Action programmes are to be:

- Graduate students to be competent engineers
- To develop awareness among students regarding industrial environment during study.
- Exchange of information and experts/academics.
- Development of institutional facilities.
- Joint continuing education programmes.

Facilities:

In line with the programmes, the following facilities are required:

Table-4-33 Interaction Core Facilities of Engineering College, Bhuj

No.	Utility Area	Carpet Area in m^2
1	Room for Professor (Industry Institute Interaction)	20.00
2	Room for Liaison officers	20.00
3	Office	20.00
4	Computer Room	30.00
5	Conference / Campus Interview Room (Common with continuing education centre)	100.00
6	Reprography Room	30.00

Equipment:

Table-4-34 Interaction Core Equipment of Enginreering College, Bhuj

No.	Item
1	Furniture
2	Vehicle
3	Separate phone connection with FAX machine
4	Modem for networking with industries
5	Computers
6	Plain paper copier
7	Public address system for Campus interview orientation
8	TV, VCR, Projection system for projecting cassettes of industries during seminar, interview etc.
9	Scanner
	Total

Continuing Education Core

The rapid change in technology emphasizes to effect change in manufacturing processes to enable the industrial establishment to complete on cost as well as on the quality aspect of

their product in the market. The change of manufacturing process needs the replacement of equipment as well as technocrats. Upgrading the knowledge and skill of those involved the industries is a crucial element to cope with the change. Moreover rural youth, especially girls, may not attend the Institute due to social and economical constraints. Therefore the Distance Learning Mode of education is the only solution for them to study at home. There are hundreds of technicians and skilled workers with the eagerness to learn more but without the chance to learn. Continuing Education is the only way left to realize the social justice for them.

Objectives of the Core are to be:

- To bring the latest knowledge to 80% of the workers in the industries.
- Keep them aware of development in the field of computers, Information Technologies, Mechatronics CAD-CAM, etc.
- Improve the knowledge of the persons working in different technical professions.
- To set up closer Industry Institute relationships
- To provide opportunities of acquiring degrees to youths in industries, in rural area and to girls.
- To offer opportunities to technical persons to upgrade their knowledge to cope with the changing technologies.
- To provide technical education facilities to adult learners through non-formal programmes.
- To provide facilities to dropouts from formal education striving to continue their career through non-formal programmes.

Facilities:

Table-4-35 Continuation Core Facilities of Engineering College, Bhuj

No.	Items	Carpet Area in m^2
1	Seminar Room	70.00
2	Conference (Common with I.I.I. Centre)	-
3	Office	80.00
4	Reprography Room & Computer Room(Common with I.I.I. Centre)	-
5	Store Room	100.00
6	Public Relation Officer Room	15.00
7	Reception Room	25.00
8	Distribution Counters	20.00
9	Training Hostel (Guest House, common with Institute)	238.00
	Total	548.00

Equipment:

Table-4-36 Continuation Core Equipment of Engineering Collage, Bhuj

No.	Items	Units
1	Furniture	Set
2	Office Equipment	
	Computer	2
	Photo Copier	1
	Telephone, Fax, Modem	Each
	Printer	1
	OHP	1
	Projection System	1
	Slide Projecter	1
	V.C.R. / D.V.D. Player	1
	TV	1
3	Books	Set

Fig.-4-30 Government Engineering College, Bhuj

- Giodesic Dome for Temporary Facilities

④ Bhuj Institute of Technology

The Academic Plan of the Government Engineering College, Bhuj has been energetically studied by the directorates concerned and is progressing to be an autonomous institution having AICTE/Govt. approved degree level courses and future post graduate courses in future with deemed university status. The title of this section is to express the future image of this college.

As an evolving organization, generally speaking, every educational facility should be changing to cope with evoluving society and industry. The collapse of the existing facilities

by the disaster might be a precious chance to drastically evolve to be a futuristic Institute of technology for the Government Engineering College, Bhuj.

Not only the concept but also the technology to be installed for the institute should be modern such as having sophisticated earthquake resistant structures, an advanced desalination plant, non-conventional energy saving devices, an internal optics cabling for IT Campus, rainwater harvesting equipment etc.

The revised outline of the campus will be as in the table bellow:

Table-4-37 Future Courses of Institute of Technology, Bhuj

No.	Proposed courses	Proposed intake
1	Post Graduate Courses	150
2	Undergraduate Courses	Included in No.1
3	Mechanical Engineering	60
4	Electrical Engineering	60
5	Information Technology	60
6	Computer Engineering	60
7	Electric & Communication Engineering	60
8	Mechatronics	60
9	Disaster Modeling	60
	Total	**570**

In line with the revised outline the GOG are planning to set up a programme for the implementation of this project as follows:

Scope of Works

I. To develop:

- Detailed Plan
  Account of how the Technical Institution at Bhuj/Kutch will be established in phases.
- Institutional Plan
- Academic Plan
- Curriculum Development Plan
- Financial Plan
- Faculty Plan
- Total Project Management Plans

  for its being an affiliated Institution initially, with a future provision of its being

autonomous/deemed to be an university, etc.

- Supervision and Quality Assurance Plan

II. Organize/execute the establishment of laboratory/library/computer center/information center including procurement of equipment, furniture, books and other goods.

III. Design, supervise and manage the reconstruction of the Institute.

Terms of Refernce

I. Preparation of Detailed Institutional Plan

The Institutional Plan, the Academic Plan, the Financial Plan and the Faculty Plan shall be detailed out for implementation purpose. The Faculty Plan, and The Personnel Plan shall be as per the Statutory Norms while the admission procedures shall be as per the Statutory / Govt. Rules.

Institutional Plan

Detail out the following:

- Management structure including governance aspects
- External linkages
- Appropriate campus model including landscaping

Academic Plan

Prepare detailed curricula and detail out academic programmes to be offered by the institute.

Financial Plan

Provide projection over five year period from inception, including funds to be available through student's fees. The revenue and non-revenue income and expenditure will be taken into account. The proposed fee structure will be as per the Statutory / Govt. Norms.

Faculty Plan

Provide the composition of the core faculties at the institute, along with requisite qualifications and other details such as staff-student ratio to be observed. The Faculty Plan shall be as per the Statutory Norms.

II. Procurement of equipment and establishment of laboratories.

- Detail the technical requirements of the Institute and provide for the establishment of laboratories, audio / visual rooms etc.
- Receive and evaluate quotations on a financial and technical basis.
- Shortlist and award contracts to procure computers / equipment.
- Establish laboratories and computer rooms.

III. Construction Management of Institute Site

Prepare a master plan of the Institute, which shall include design and detailed engineering of the Institute. The Master Plan will include civil, architectural, sanitary, electrical and other internal and external services including systematic phase growth. The construction conditions shall be as per the World Bank guidelines. The activities will be:

a) Preliminary drawings and estimates

Prepare preliminary conceptual building drawings to complete internal and external provisions of the Institute.

b) Detailed building drawings

Get approval from the component authorities for preliminary building drawings, detailed engineering drawings, counter plan, landscape plan of the site, external electrification plan, water supply schemes, sewage disposal, storm water drianage, working drawings, structural drawings, internal electrification, plumbing drawing and cost estimations.

c) Cost of civil works

The cost should be suggested on a % basis of the actual costing.

d) Cost of procurement

The cost should be suggested on a % basis of the actual cost.

e) Suggested payment schedule

To carry out the Project on a turn-key basis, a phase-wise payment schedule is to be suggested.

(b) R.D. Gardi Government Pharmacy College, Lakhtar

The College is in Lakhtar of Surendranagar, on the southeast side of Kutch district, also awfully devastated by the earthquake.

① Background

The College was totally destroyed on the day. All the machinery, equipment, furniture, books etc. were buried under debris. As Reconstruction Support, JICA is striving to help to reconstruct basic healthcare facilities as social infrastructures in the affected area. So it is important to study the present situation of pharmacy education in the area as a vital element of healthcare programmes.

② Pre-earthquake Status

The Academic programmes conducted at Pre-earthquake status were as follows:

Table-4-38 Courses of Pharmacy College, Lakhtar

No.	Name of Course	Intake
1	Diploma Pharmacy	40
2	Degree Pharmacy	60
3	Post Graduate Pharmacy	10
	Total	110

In order to restart the academic activities in the R.D. Gardi Government Pharmacy College, Lakhtar, all the academic, administrative and residential buildings have to be reconstructed with all equipment and infrastructures in the existing site.

③ Academic Plan

As a Reconstruction Proposal, an Academic Plan is prepared as follows:

Table-4-39 Academic Plan of Pharmacy College, Lakhtar

No.	Item	Diploma	Degree	Post Graduate	Total
1	Annual intake	40	60	10	110
2	Total strength	120	240	20	380
3	Programme duration	3 years	4 years	2 years	6 years

Teaching staff will be;

Table-4-40 Staff of Pharmacy College, Lakhtar

No.	Teaching staff	Number
1	Principal	01
2	Professor	02
3	Assistant Professor	04
4	Lecturer	12
	Total	19

④ Facilities and Equipment

The following requirement is prepared by the GOG and yet to be studied further in detail.

Facilities:

Academic:

Table-4-41 Academic Facilities of Pharmacy College, Lakhtar

No.	Requirement	Area (m^2)	Carpet Area m^2
1	Classroom	5 × 66	330
2	Laboratory	8 × 100	800
3	Library / LRs etc.	1 × 100	100
4	Computer center	1 × 88	88
5	Faculty room	1 × 44	44
6	Seminar room	1 × 66	66
7	Reprography Center	1 × 22	22
8	Ladies room	1 × 22	22
9	Boys room	1 × 22	22
10	PH room	1 × 11	11
	Total		1,505

Administrative:

Table-4-42 Administrative Facilities of Pharmacy College, Lakhtar

No.	Requirement	Area (m^2)	Carpet Area m^2
1	Principal's office	1 × 22	22
2	Confidential room	1 × 11	11
3	Establishment	1 × 66	66
4	Central Store	1 × 22	22
	Total		121

Residential:

Table-4-43 Residential Facilities of Pharmacy College, Lakhtar

No.	Requirement	Area (m^2)	Carpet Area m^2
1	Principal quarters	1 × 150	150
2	Professors quarters	1 ×120	120
3	Assistant Professors quarters	2 × 100	200
4	Lecturers quarters	2 × 90	180
5	Hostel/Accommodation for faculty	4 × 30	120
6	Boys hostel (100)	1 × 600	600
7	Girls hostel (50)	1 × 350	350
8	Class Ⅲ quarters	4 × 50	200
9	Class Ⅳ quarters	4 × 30	120
	Total		2040

Student Amenities:

Table-4-44 Amenities Facilities of Pharmacy College, Lakhtar

No.	Requirement	Area (m^2)	Carpet Area m^2
1	Canteen	1 × 100	100
2	Guest room	3 × 22	66
3	Warden office	1 × 11	11
4	Medical facilities	1 × 11	11
	Total		188

Grand total carpet area is ①+②+③+④ = 1,505m^2 + 121 m^2 + 2,040 m^2 + 188 m^2 = 3,854 m^2.

Total plinth area required = Carpet Area × 1.4 = 3,854 m^2 × 1.4 = 5,396 m^2.

Equipment:

Table-4-45 Equipment of Pharmacy College, Lakhtar

No.	Requirement
1	Furniture
2	Laboratory Equipments, books, LRs etc.
3	Support facilities and maintenance facilities

4.6.3 Basic Healthcare Sector

As a preparatory study for the Rebuilding Plan the Project Team studied the possibility of further support for the devastated basic healthcare facilities.

The Project Team has implemented the QRS project by constructing 2 CHCs in Kutch District as reported in other sections. The officials concerned and the Project Team have discussed about the needs of further support at the meetings for the reconstruction of the CHCs.

The followings are the summary of the discussions.

(1) Summary of Studies

Almost all hospitals in Kutch District, approximately 17% of the CHCs, 4% of the PHCs and 3% of the sub-centers in the State of Gujarat collapsed or damaged by the earthquake. Healthcare in the area have been utilizing tents or temporary facilities mainly provided by NGOs/ international agencies. The Commissionerate of Health, Medical Services and Medical Education has been making its utmost effort to help implement the reconstruction project with utilizing the help of NGOs and WB/ADB loan or the GOG/GOI budget. However on account of the financial shortage of the GOG/GOI the Commissionerate has come to recognize the difficulties for the realization of its target to completely restore the basic healthcare infrastructure by 2003. The potential project, which is a package project consists of 5 items, is shown below in accordance with the minutes of the meetings dated August 14th, 2002.:

Table-4-46 Items of A Package Project in Basic Healthcare Sector in Detail

No.	Item	Areas in ha.	Periodical Term	Completion
1	Mental Care and Rehabilitation Centre at Bhuj (Former Bhuj Mental Hospital)	Not Fixed	Short	2003
2	Expansion of Anjar CHC:			
3	Regional Logistic Medical Store Centre at Bhuj			
4	6 PHCs including Staff Quarters (7 units) in each PHC			
5	5 Allopathic Dispensaries with Staff Quarters (5 units) in each Dispensary and 3 Sub Centres			

There may well be one-by-one base cooperation or parallel base cooperation as the GOG intends to be supported as many projects as possible.

(2) Outline of Potential Project

1) Short Term Cooperation

Because the items in this package project are urgently needed, the short term cooperation is the most preferable one for realizing this project. However, the procedural requirements of both the governments needs to be fulfilled and details of each item must be further clarified in order to implement the project when/if this project is taken by the GOJ.

(a) A Package Project

In order to fulfill the required medical services for the people of Kutch as well as the victims of the earthquake in totality the package includes the needs 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 needs was recognized after rehabilitation and reconstruction activities began. Also in order to provide healthcare services at the PHC, dispensaries and sub-centre levels as soon as possible, the package includes urgent reconstruction of PHCs, dispensaries and sub-centres, which was originally allocated to another NGO that had not carried out any reconstruction activities even after 19 months from the earthquake.

The following describes the background and brief requirements of the itmes,

① Mental Care and Rehabilitation Centre at Bhuj

The Mental Hospital, Bhuj was completely destroyed except for a small lightly damaged structure currently being used as an administrative office. Some temporary rooms were constructed to carry out its medical services, however, new permanent facilities are much awaited because the temporary rooms barely serve the needs that the Centre is supposed to provide.

Required facilities

- Halfway Home:
  To accommodate 20 occupants (10 male and 10 female) with utility equipments and hospital furniture
- Shelter Rehabilitation Workshop:
  To accommodate 30-40 patients with equipments and appliances for workshop

② Expansion of Anjar CHC

After completion of the QRS project for the CHC at Anjar, the CHC was re-categorized as a referral hospital & CHC and the function of the CHC naturally broadend from the usual CHC level. The following are the required facilities due to the upgrade.

- 15 bedded Orthopaedic Ward
- 10 bedded Rehabilitation & Physiotherapy Centre with equipments and instruments
- Staff Quarters for Class III (12 units) and Class IV (20 units)
- One number of Ambulance

③ Regional Logistic Medical Store Centre at Bhuj

There is only one central medical store in Ahmedabad for the whole Gujarat State at present. It took more than a week to deliver necessary medical supplies to certain part of Kutch when the earthquake occurred thereby revealing vulnerability of the existing government's medical supplies distribution system in the State. Upon realizing the weakness the GOG decided to decentralize the present distribution system of medical supplies, specifically, by constructing several regional logistic medical stores within various parts of the State. The regional logistic medical store at Bhuj is one of the cetnres the GOG planned.

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

The six PHCs were originally allotted to another NGO, Indial Red Cross, however, no reconstruction activities have taken place even 19 months after the earthquake (as of August 14th, 2002). Considering the difficulties that the people of the catchment areas of the PHCs, possibilities of reallocation of the PHCs are sought for.

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

The five Dispensaries and thee Sub Centres were originally allotted to another NGO, Indial Red Cross, however, no reconstruction activities have taken place even 19 months after the earthquake (as of August 14th, 2002). Considering the difficulties that the people of the catchment areas of those Dispensaries and Sub Centres, possibilities of reallocation of them are sought for.

Realization of this package project would further signify the healthcare sector rehabilitation activity in Kutch district carried out by JICA as a whole with synergetic effect along with the reconstruction of the CHCs at Anjar and Mundra.

4.6.4 Community Training

As a preparatory study for the Rebuilding Plan the Project Team held meetings with the officers of GSDMA and during the course of discussions, an issue of exploration of possibilities for participating in long term disaster management capacity building of communities through community trainings in collaboration with GSDMA was brought up. 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. Though there may be many issues to be cleared before the realization of this request, it is thought that there would be a positive impact on the people of Gujarat for enhancement of their preparedness for future natural disasters.

Since this is a know-how transfer project, no request for fisical construction is indluded in this request at the moment.

PART 3

Chapter 5. Quick Reconstruction Support Project

5.1 Outline of Quick Reconstruction Support Project

There are two main objectives in the Project. The first is to form long term and mid term schemes which are described in Parts 1 and 2. The second is to carry out the Quick Reconstruction Support (QRS) project, which is to urgently reconstruct damaged and malfunctioning facilities as a part of the overall Project. It is essential to reconstruct the malfunctioning facilities as soon as possible in order to achieve evident results of the Project.

Educational and healthcare sectors have been chosen as the target sectors for the Project among the sectors of basic human needs support because these sectors adopt well with the aim of Japan's Official Development Assistance. After the discussions between the GOG officials and the Project Team, and in consideration of the rebuilding plans formed by the GOI and GOG, and assistance by other NGOs and organizations, the GOG confirmed that the reconstruction of primary school classrooms in the educational sector and the reconstruction of CHCs in the healthcare sector are parts of the Project. Also, as described in Chapter 4.4, the GOG decided that the Kutch district, which was damaged the most, should be the target district for the Project. The potential primary schools and CHCs for the QRS project were selected by the GOG and the Project Team studied the sites for finalizing the site selection. After study and approval from JICA, the sites for the QRS project were finalized.

The counterpart organizations that the Project Team held discussions with regarding the QRS project are shown in the following chart (Fig.5-1).

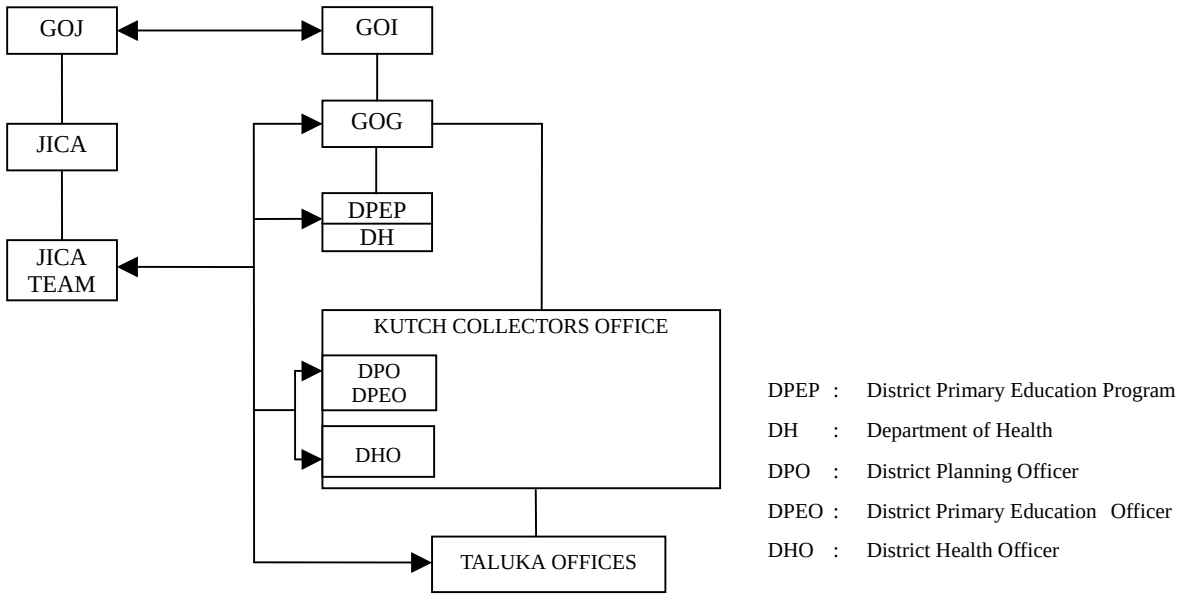


Fig. 5-1 Authorities Concerned to the QRS Project

District Primary Education Program (DPEP) of the GOG is in charge of primary education for the entire Gujarat State and the District Primary Education Officer (DPEO) at the Kutch Collector's office coordinates assistances from NGOs/other organizations to each primary school in Kutch district. The Department of Health (DH) of the GOG is in charge of healthcare services for the entire Gujarat State and the District Health Officer (DHO) coordinates the actual management level in Kutch district.

5.2 Design Policy for Primary Educational Facilities

The extent of damage caused by the earthquake on primary education facilities were more severe both in quantity and quality compared to the ones on secondary or higher education facilities. In general, it is because those facilities were built years before the higher education facilities with inadequate technology not suitable for earthquake zone-V, such as masonry bearing walls without proper ties, because providing primary education for the people was the topmost priority.

As shown in Table 5-1, among the 1,379 primary schools in Kutch district, almost all the primary schools were damaged. 2,100 classrooms out of a total of 5,356 were destroyed and 2,440 other rooms were partially destroyed or were damaged to the extent that they cannot be used without repair.

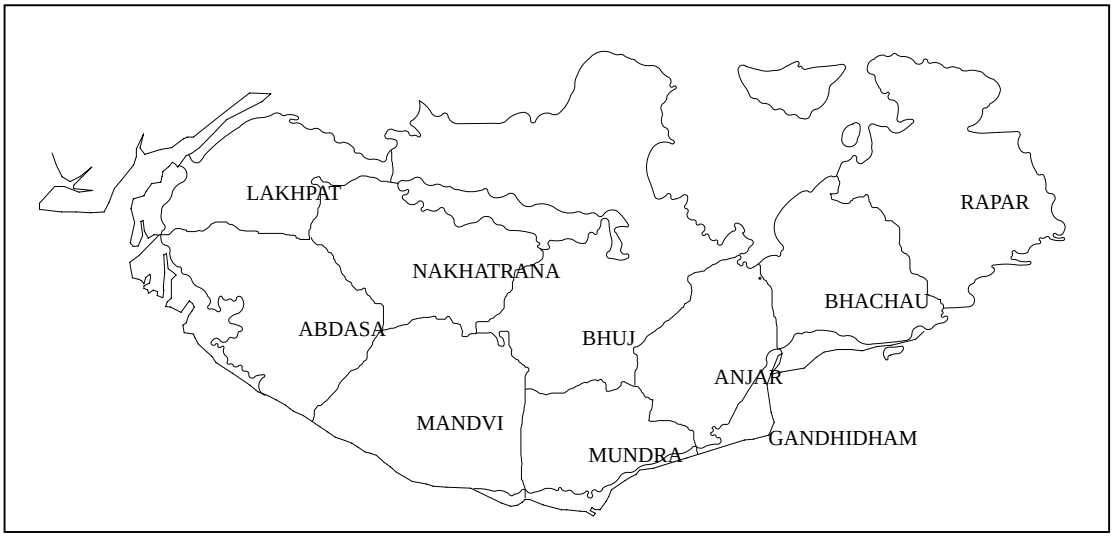


Fig. 5-2 Taluka of Kutch District

The damage to the facilities have forced 201,932 pupils and 5,150 teachers of the primary schools in Kutch district to use temporary rooms and tents which provide only minimum sheltering. The temporary classrooms are typically made of timber column/beam frames and galvanized steel sheets for walls and roofs, or basic temporary prefabricated structures that do not have much heat isolation

nor weather resistance, and hence the lifespan of the structures are very short.

Table 5-1 Damages to Primary Schools in Kutch District

District name		No. of primary schools	No. of classrooms	No. of collapsed classrooms	No. of partially damaged classrooms	No. of teachers	No. of pupils
1	Bhuj	242	933	348	537	1,040	42,290
2	Mandvi	159	720	83	464	670	25,560
3	Mundra	(estimated)103	376	122	234	366	12,622
4	Anjar	83	337	297	71	361	14,012
5	Bhachau	124	602	475	39	475	20,112
6	Rapar	221	656	472	160	661	28,833
7	Abadasa	160	493	129	304	440	14,379
8	Nakhatrana	155	751	148	478	603	21,981
9	Lakhapat	92	206	26	153	221	7,555
10	Gandhidham	155	282	-	-	313	14,588
Total		1,379	5,356	2,100	2,440	5,150	201,932

Source: Damages to Primary Education Earthauake-2001, District Panchayat Kutch

It is observed that the locations of the primary schools in most of the villages are near the village centre. This maybe because the locations were selected so that villagers could watch the pupils going to and from the school, as well as during classes, with or without intention. Or perhaps the schools were the cores of the communities and surrounding houses were later built around the school. Though most of the primary schools were old, they were of better quality than the typical houses in the rural areas of Kutch district. Thus it could be assumed that the primary schools, except for the temples and the like, provided a core function for the community.

Upon completion of the QRS project, with the construction of seismic zone-V approved classroom structures, not only the school function will be restored, but also there is a possibility that the schools could be used for other purposes by the community, such as a space for communal interaction/coordination for reconstruction of the village.

The five schools for the QRS project, Sumarasar Sheikh of Bhuj Taluka, Bhadreshwar Kumar and Bhadreshwar Kanya of Mundra Taluka, Mathak and Dhamadka of Anjar Taluka, were selected by the GOG after incorporating the results of the JICA Team's site study. After analyzing and examining the requested number of classrooms, available areas and shape of the school plots, the number of classrooms was decided for each school. The GOG has already allotted other schools to other organizations and NGOs for their reconstruction.

The allotted number of schools for this QRS project, which is five, is relatively small considering a total of 1,379 damaged schools in Kutch district. However, the classroom reconstruction will have

effects on the whole village as mentioned above. Thus there would be a ripple effect on the community by the QRS project beyond measurements such as the number of schools and classrooms.

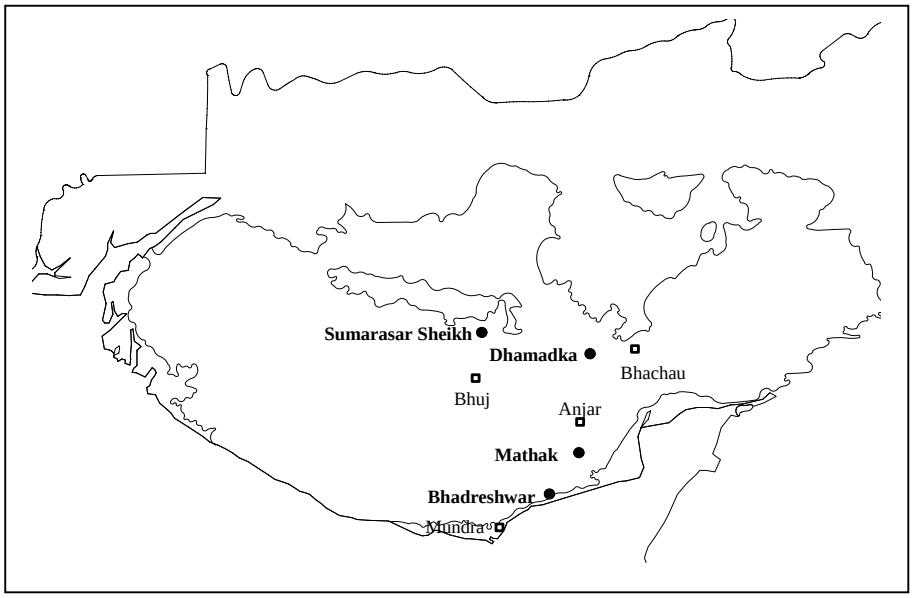


Fig. 5-3 Construction Sites of Class Rooms

The numbers of existing classrooms before the earthquake, collapsed/damaged classrooms, and proposed classrooms are shown in the following table.

Table 5-2 Number of Classrooms

	Name	Before earthquake	Collapsed	Damaged	Proposed
1	Sumarasar Sheikh	9	4	5	5
2	Bhadreshwar (Boys)	8	8	0	8
3	Bhadreshwar (Girls)	7	4→7	3→0	6
4	Mathak	8	8	0	9
5	Dhamadka	7	7	0	7
Total		39	31→34	8→5	35

Source: DPEO Bhuj

Note: Though the number of collapsed classrooms at the existing Bhadreshwar girls school is 4, it is counted as 7 because the girls school will be shifted adjacent to the Bhadreshwar boys school due to its current confined site situation. Thus the total numbers of collapsed and damaged classrooms are counted as 34 and 5, respectively.

The total number of collapsed classroom is 34 and an almost equivalent number of classrooms, 35, is proposed and planned for the QRS project.

Though the actual number of pupils per classroom varies slightly depending on the school, there are on average about 38 pupils per classroom. The floor area (calculated wall-center to wall-center) of one classroom is 36 m^2 and thus the floor area per pupil is approx. 0.95 m^2. This floor area per pupil is not too small since the pupils typically sit directly on the floor without using desks and chairs in

classes.

As one of the main purposes of the Project is urgent reconstruction support for the earthquake damaged facilities, reconstruction of facilities at the minimum level required to restore the pre-existing functions prior to the earthquake is the topmost priority of the QRS project.

Thus classrooms, sanitary units, boundary walls and gates are to be built for the primary schools under the QRS project, and teachers' rooms, store rooms for teaching materials/equipment, etc. are to be provided by the GOG in the course of time.

'Permanent' prefab construction was chosen as the construction method for building classrooms, taking into consideration the securing of high quality work, minimizing the construction period and delivering the classrooms to the GOG as early as possible. Regarding the material of the classrooms, precast concrete prefab, not steel structure prefab, was selected for its superior characteristics in terms of thermal insulation, weather durability, and to match with the surroundings of the village.

5.3 Design Policy for Healthcare Facilities

Under the healthcare referral system in India, a district hospital is provided as the higher referral medical facility within a district and a community health centre is provided for every 100,000 people, a primary health centre for approx. every 30,000, a sub centre for approx. every 5,000. It is unavoidable that there are differences in catchments areas of each healthcare facility when they are placed according to the relative population because population density varies place by place. The present situation of healthcare facility distribution in Gujarat State and Kutch district is as follows.

Table 5-3 Numbers of Health Facilities

	Gujarat State	Kutch District
District Hospital & Other Hospitals	50	4
CHC	253	10
PHC	1,023	37
Sub Centre	7,274	251
Dispensary	108	37

Source: DH, GOG

Assuming that the total population of Kutch district is 1,526,000, the present numbers of established CHCs, PHCs, Sub-Centres as shown in the above table 5-3 show that the number of healthcare facilities in Kutch district fall about 20% short of the number required. Moreover, the earthquake

extensively damaged the healthcare facilities in Kutch district, e.g. all 4 district hospitals were destroyed, 4 out of the 10 CHCs were also destroyed and the remaining 6 were partially damaged.

Table 5-4 Damage to Healthcare Facilities in Kutch

	No. of Existing Facil.	Collapsed	Partially Damaged
District Hospital & Other Hospital	4	4	0
CHC	10	4	6
PHC	37	15	19
Sub-Centre	251	95	119
Dispensary	37	16	14

Source: DH, GOG

Among the healthcare facilities, which were destroyed or severely damaged, the GOG has decided a policy to reconstruct hospitals and CHCs and the organizations responsible for reconstruction of the said facilities have also been decided. Accordingly, Anjar CHC and Mundra CHC were allotted by the GOG for this QRS project.

The district hospital at Bhuj which had 281 beds before the earthquake is planned to be reconstructed as a 500 bed hospital with expanded diagnosis and treatment facilities and to serve the Kutch district as the central medical facility.

Table 5-5 Reconstruction of Hospitals & CHCs in Kutch District and Responsible Agencies

Hospital		Existing Bed Nos.	Planned Bed Nos.	Agency
1	Bhuj	281	500	Prime Minister
2	Gandhidham	50	50	Indian Medical Association
3	Bhuj/Mental	20	50	European Commission
4	Mandvi	100	100	Delhi Municipal Corporation
CHC				
1	Anjar	75	50	JICA
2	Mundra (partial damage)	30	30	JICA/Maternity Building
3	Bhachau	30	30	Gem & Jewellery Ltd.
4	Lakadiya	30	30	J.W. Global
5	Rapar	30	30	Malayala Manorama

The damaged 44 PHCs and 181 Sub-Centres in Gujarat State have also been allotted to other organizations such as UNICEF, Indian Red Cross, and other NGOs and are awaiting execution of reconstruction work.

All the healthcare facilities and staff quarters at Anjar CHC were totally destroyed by the earthquake. Healthcare services are currently provided by setting up tents and temporary prefab structures with 8 beds within the CHC premises, which is barely enough for the actual needs.

Some of the CHC staff are living in tents built within the premises, however, the excess number of the staff due to decreased healthcare services are staying in their hometown or elsewhere.

In order to restore the basic functions of the CHC, it is necessary to reconstruct the main healthcare building and supply medical equipment. Further, in order to meet the functional demand for expected healthcare services, such as nighttime emergency cases, etc., it is mandatory that staff quarters for essential medical staff, e.g. Medical doctors (class-I, II staff), Nurses and Lab. Technicians (class-III staff) be reconstructed within the premises. Whilst is it is comparatively easy to find suitable houses for the class-IV level staff in Anjar, it is hardly possible to find good quality/condition houses, e.g. having decent toilets, bathrooms etc., for renting to staff at medical officer level.

It was decided that the level IV staff quarters will be constructed by the GOG in the future and until then they will be compensated with a standard housing allowance.

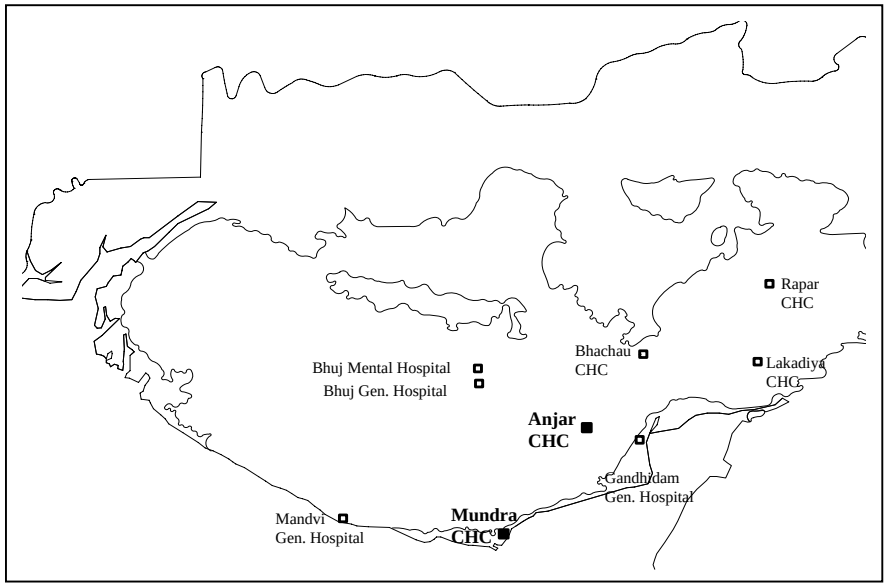


Fig. 5-4 Hospitals and CHCs in Kutch District

The original Anjar CHC building was constructed as a 75 bed hospital in 1956. It was converted to a Community Health Centre when the healthcare service system was reorganized. Typically, one CHC is referred to from 4 to 6 PHCs, and is positioned between the PHCs and district Hospitals. A standard CHC has 30 beds and the assumed number of outpatients per day is about 300. However, some important CHCs have a 50 bed capacity. In view of the increase in urban population of Anjar Taluka, the number of beds in planned Anjar CHC has been decided to be 50. Patients with complications, or who require higher levels of treatment, etc., are referred to Bhuj General Hospital.

The main healthcare facility and most of the staff quarters buildings at Mundra CHC were subject to certain degrees of damage but are still functioning. Hence the necessity for reconstruction of those buildings is rather lower, however, the maternity building was severely damaged and needs to be reconstructed. A part of the main healthcare facility is currently used as the maternity ward with a decreased capacity, causing hindrance to the overall healthcare performance of Mundra CHC. Thus it is necessary to reconstruct the maternity building as a part of the QRS project in order to assist restoration of the Mundra CHC functions as soon as possible. Medical equipment of the maternity building at Mundra CHC is still kept there and will be used for the QRS project, so no additional medical equipment needs to be provided.

In summary, the QRS project includes the construction of the main healthcare facility, auxiliary buildings works, staff quarters and the supply of requested necessary medical equipment for Anjar CHC, and the construction of the maternity building for Mundra CHC. The contents of the facilities and the size are determined on the basis for provision of CHC functions, but not hospital functions, so that the maintenance and running costs will not exceed that of a CHC.