JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
MINISTRY OF EDUCATION AND CULTURE,
THE KINGDOM OF NEPAL

BASIC DESIGN STUDY REPORT ON THE PROJECT FOR EXPANSION OF THE EDUCATIONAL MATERIALS CENTRE IN THE KINGDOM OF NEPAL

MARCH 1993

UNICO INTERNATIONAL CORPORATION

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PREFACE

In response to a request from His Majesty's Government of Nepal, the Government of Japan decided to conduct a basic design study on the Project for Expansion of the Educational Materials Centre and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Pakistan a study team headed by Yasushi Hiroshige, Deputy Director, Textbook Division, Elementary and Secondary Education Bureau, Ministry of Education, Science and Culture and constituted by members of UNICO International corporation, from October 27 to Novermber 13, 1992.

The team held discussions with the officials concerned of His Majesty's Government of Nepal, and conducted a field study at the study area. After the team returned to Japan, further studies were made and the present report was prepared.

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

I wish to express my sincere appreciation to the officials concerned of His Majesty's Government of Nepal for their close cooperation extended to the team.

March , 1993

Kensuke Yanagiya

Kensuke Yanagiya
President
Japan International Cooperation Agency

March 1993

Mr. Kensuke Yanagiya
President
Japan International Cooperation Agency
Tokyo, Japan

Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Expansion of the Educational Materials Centre in the Kingdom of Nepal.

This study has been made by UNICO International Corporation, based on a contract with JICA, from October 22, 1992 to March 15, 1993. Throughout the study, we have taken into full consideration of the present situation in Nepal, and have planned the most appropriate project in the scheme of Japan's grant aid.

We wish to take this opportunity to express our sincere gratitude to the officials concerned of JICA , the Ministry of Foreign Affairs and the Ministry of Education, Science and Culture. We also wish to express our deep gratitude to the officials concerned of Janak Education Materials Centre, JICA Nepal Office and the Embassy of Japan in Kathmandu for their close cooperation and assistance during our study.

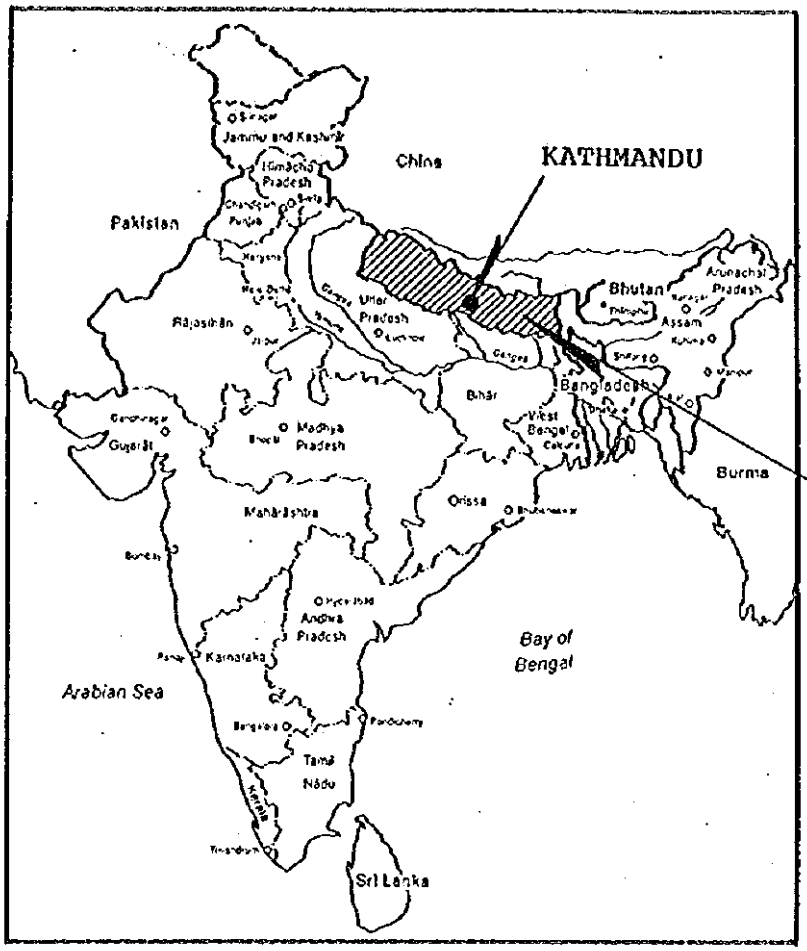
At last, we hope that this report will be effectively used for the promotion of the project.

Very truly yours,

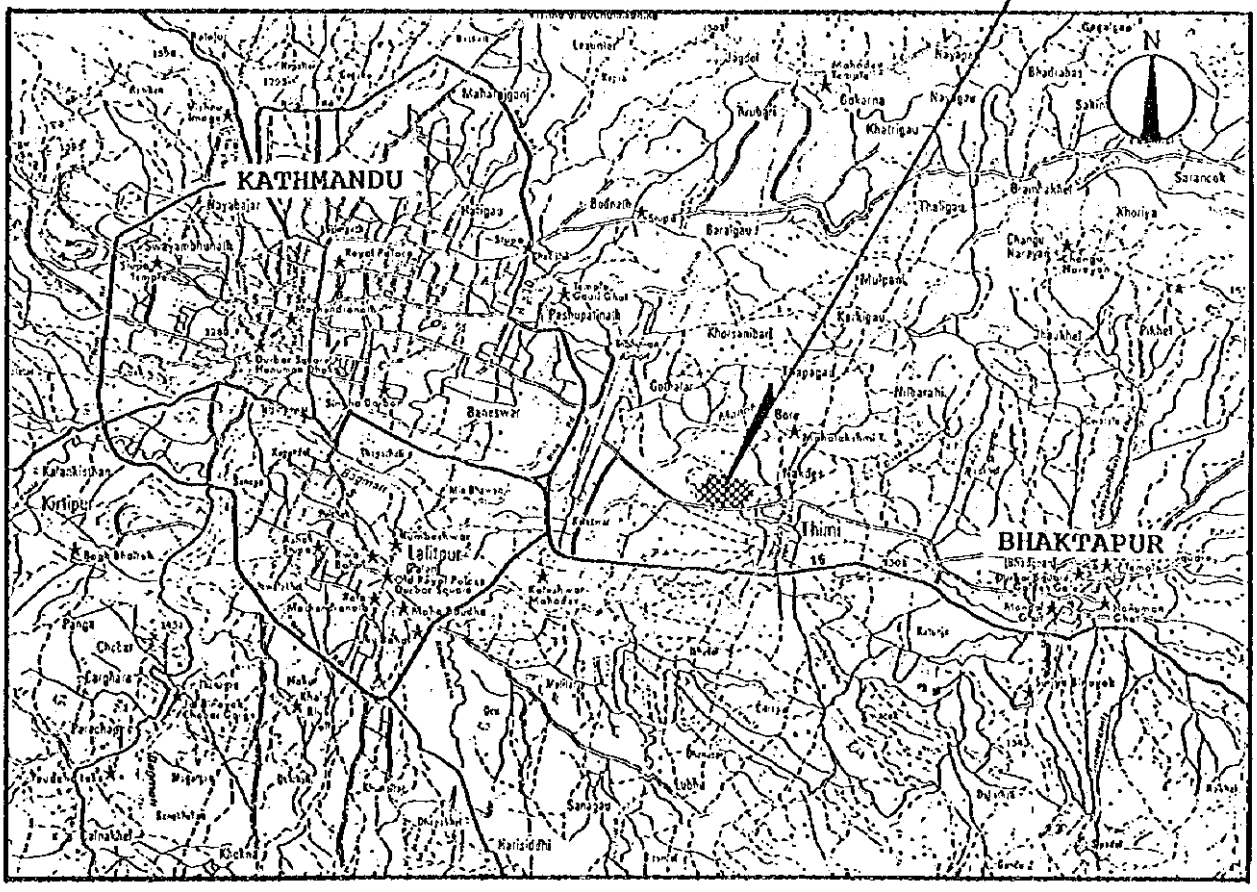
Kiko Nagasawa

Kiko Nagasawa
Project Manager,
Basic Design Study Team on
the Project for Expansion of the
Educational Materials Centre
UNICO International Corporation

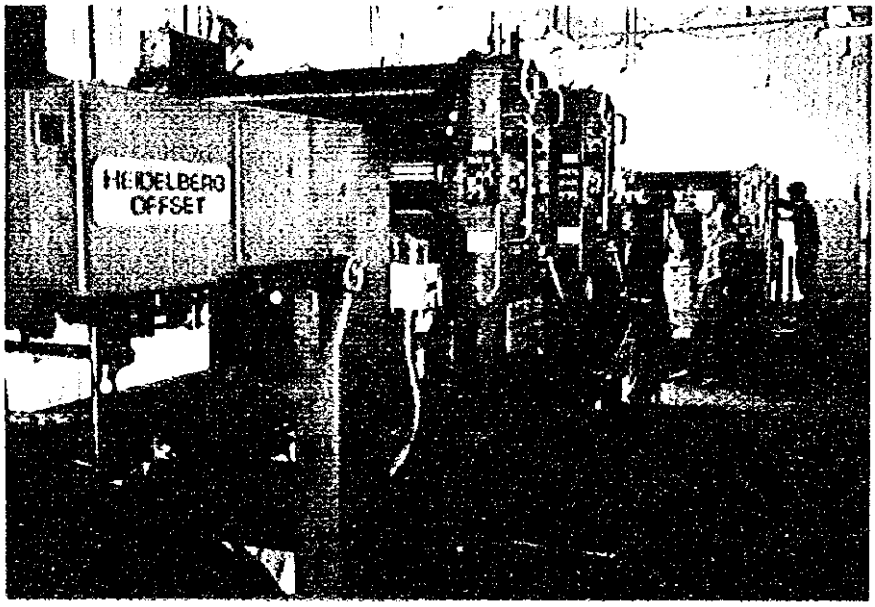
LOCATION OF
THE PROJECT SITE



JANAK EDUCATION
MATERIALS CENTRE



New Factory Block and
Site of Extension Block



Existing Printing Press

Manual Folding Operation

SUMMARY

SUMMARY

The expansion and systematic development of education in the Kingdom of Nepal started in 1951 with the Restoration. In 1971 the National Education System Plan (NESP) was formulated and the unified educational target was established. Curricula and textbooks were made uniform throughout the Kingdom. The present primary and secondary education system provides five years of primary education (Grade I-V) and five years of secondary education (Grade VI-X). One of the objectives of the primary education is to raise the literacy rate and Nepali is used in teaching. In 1977 a free education system was introduced in primary education. In 1980 free distribution of textbooks started to students of Grade I, II and III. The free distribution system has been extended and in 1997 all the students of public primary schools are to be provided textbooks free of charge.

These measures on education have resulted in the rapid increase of schools, teachers and students in primary and secondary education. Education has spread remarkably. However, there are still many problems in the education in Nepal.

1) The literacy rate, although it has increased, is still as low as 36 % (in 1990). Especially the literacy rate of women is as low as 18 % while that of men is 52 %.

2) The participation rate at primary education level has increased much and the statistics shows it as 107 % in 1990. However, the World Bank (Basic and Primary Education Project:1992) reports that only half of the boys and one third of the girls of school ages (6-10) are enrolled. Those who proceed to Grade II from Grade I are not many. There are many dropouts and repeaters.

3) Enrollment of girls is still low.

4) Classrooms in primary schools are not enough to accommodate the increasing students.

5) Teaching is not adequate and the quality of teachers is low. The quality of education has not yet been improved.

6) The textbook contents are outdated. The design of textbooks is poor.

In these circumstances, His Majesty's Government of Nepal (abbreviated to HMG) gives a priority to the policies of making basic and primary education accessible to all and increasing the literacy rate, and of enhancing the efficiency and quality of the education sector. In order to achieve these policy objectives, HMG has placed priority on the development and expansion of basic and primary education in the education and culture sector and has taken several measures. The Primary Education Project (PEP 1989-1992) was carried out in 6 districts with the support of the World Bank, international organizations and some countries. It was a success. Extending the concept of the PEP, HMG started "Basic and Primary Education Project (BPEP 1992-2000) which includes all aspects of basic and primary education aiming to apply the project to the whole country by the year 2000. The World Bank, ADB, UNICEF, UNDP, Japan (JICA) and Denmark (DANIDA) are supporting or planning to support the BPEP. The BPEP consists of the following three components.

1) Improvement of the quality of basic and primary education (development of curricula and textbooks, in-service teacher training and increase of women teachers).

2) Increase of accessibility to basic and primary education (promotion of non-formal education, primary school construction).

3) Improvement of management of basic and primary education (establishment of a management system of the BPEP, development of primary school design capacity, school facilities construction programme management).

The Janak Education Materials Centre was established in 1958 to print textbooks. It is a public limited company under the jurisdiction of the Ministry of Education and Culture and funded by the government. It is the only textbook printing factory in Nepal which produces textbooks for primary and secondary education. Since the start of the National Education System Plan in 1971, the role of the Centre has been expanded. The Centre is now printing teacher's guidebooks and other teaching materials besides textbooks. The printing facilities of the Centre are old and obsolete. Facilities installed at the inception of the Center and in the 1960's are still being used. At present the offset printing presses and book binding machineries installed in the 1980's are used for printing and book binding of textbooks. The facilities were installed not at one time but at separate times without consideration of the whole layout. The equipment is not in good working condition because parts are in short supply. The present production capacity is 9.5 million books per year. The existing facilities will continue to be used.

The demand for textbooks is increasing for the increase of school age populations, enrollment and teaching subjects which use textbooks, and the extension of the free distribution of textbooks. The Basic and Primary Education Project has developed a new curriculum and revised textbooks in line with the new curriculum. The size of textbooks has also been enlarged. The production of textbooks required in 1992 was 12 million books. Since the present production capacity of the Centre is 9.5 million books per year, the Centre is now on 24 hours work overtime. The present capacity can not meet even the present demand, much less the future demand which is predicted to increase rapidly. It is neither suitable to produce textbooks of new size. For these reasons the Centre has drawn up a plan to increase its production capacity of textbooks. HMG has requested the Japanese Government for a Grant Aid in order to expand the equipment which is necessary to increase the production capacity of textbooks at the Centre.

Upon the request, the Japanese Government decided to conduct a study on this proposal and the Japan International Cooperation Agency dispatched a basic design study team to Nepal from 27 October to 13 November 1992. The study team has confirmed the background and details of the request through a series of discussions with the Ministry of Education and Culture, Nepal and the Janak Education Materials Centre, and studied the present situation of textbook production for primary education and the implementation plan of the project in Nepal. The team also studied the functions of organizations related to this project in Kathmandu and its surroundings.

The study is summarized as follows.

(1) The output of textbooks for primary and secondary education in 1992 is about 12 million books in total. The forecast made by the Ministry of Education and Culture in November 1990 predicts that the demand will be 16 million books (20 million) in 1995 and 21 million (29 million) in 1999. The figures in parentheses are amended ones in May 1992. Although there are big discrepancies between these two figures, the demand is predicted to increase about 1.5 to 2.5 times in five or six years. The demand increased at an annual rate of 9.5 % during five years from 1987 to 1991. Judging from this past trend and the strong government policy on education, the demand for textbooks will increase as predicted in the 1990 forecast or more.

(2) The project of increasing the production capacity of the Janak Education Materials Centre consists of expansion of the printing and book binding facilities and replacement of the existing obsolete prepress facilities (preparation of negative films and press plates). The existing printing and book binding facilities will continue to be used but must be expanded to meet the increasing demand predicted for the year 2000. The newly installed production line will produce textbooks of new size; 180 x 240 mm (equivalent to B5). Until now the size is 154 x 210 mm (equivalent to A5).

(3) The new machines will be installed in the existing factory and the extension block. Construction of the extension block started in January 1991 and will be completed by October 1993. Since the Centre has enough number of staff in operation and maintenance, the new equipment will not require the increase of the operation and maintenance staff.

(4) Printing paper is purchased by international tender. Chinese and domestic paper is used. Two domestic paper mills can supply sufficient amount of paper and have a plan of expanding their production capacity. There is no problem with paper supply for increased production of textbooks. UNICEF is providing free of charge HMG with printing paper of 350 tons every year and will continue this supply for the coming five years.

Considering these situations, we have drawn up an equipment provision project to expand the production capacity of textbooks at the Janak Education Materials Centre. The outline of the project is as follows.

(1) The Executing Agency: The Janak Education Materials Centre.

(2) Plan of Activities:

The equipment to be provided through this project is for production of textbooks for primary and secondary education and is used for mass production of textbooks for lower grades of primary school. The existing facilities will be used in the production of small amount of various kinds of textbooks. By such proper use of the existing and new facilities the production efficiency will be raised.

(3) Outline of the Equipment:

The equipment planned is the one which can produce about 10 million textbooks of new size (240 x 180 mm). Three single colour sheet fed perfecting presses were requested. However, in view of the balance of the whole production processes, two single colour sheet fed perfecting presses will be installed. Five folding machines and one perfect book

binding line will be installed. A gathering machine, a perfect binding machine and a three-knifed trimmer will be connected composing one perfect book binding line. Transportation equipment will be provided to carry printing paper and signatures etc. so that they can be treated more carefully. Voltage regulators will be furnished to stabilize the supply voltage since the voltage fluctuates considerably.

(4) Place to Install:

The equipment to be provided through this project will be installed in the existing factory (the new factory block) and the extension block. The extension block is under construction and will be completed by the time of installation.

The equipment planned is as follows.

Items	Quantity
A. Prepress Process	
Vertical Compact Camera	1
Film Processor	1
Vacuum Printer	1
Plate Processor	1
Plate Punch	1
Effluent Treatment Facility	1
B. Printing Process	
Single Colour Sheet Fed Perfecting Presses	2
Single Colour Sheet Fed Press	1
C. Book Binding Process and Others	
Folding Machines	5

Perfect Binding Line	1 line
Paper Trimmer	1
Knife Grinder	1
Jogging Machine	1
Paper Lift	1
Tying Machine	1 set
Hand Lifts	2
Automatic Voltage Regulator	1 set

The cost to be borne by the Nepal side when this project is implemented through a Grant Aid of the Japanese Government is estimated at about 6.9 million rupees.

It will take 2 months for the detail design and 10 months in the procurement and installation of equipment.

When the project is implemented through a Grant Aid of the Japanese Government, the following effects are expected.

(1) The project will contribute to the spread of education and the enhancement of the quality of education by expanding the production capacity of textbooks for basic and primary education.

(2) The improvement of curriculum and textbook contents will be embodied in textbooks of new specifications and in increased volumes of textbook prescribed to students. Provision of textbooks which are more attractive to and easy to use by students will increase enrollment and reduce dropouts.

(3) These effects will help solve the problems caused by lack of education which hinder the economic development, the improvement of health conditions of people, the implementation of family planning and so on.

(4) The project will contribute to raising the level of publishing industry of Nepal through the modernization of text production which will be resulted by the technicians and workers of the Janak Education Material Center acquiring advanced techniques of prepress, printing and book binding.

The operation and maintenance system of the project is evaluated as follows.

(1) Printing paper, printing ink and other materials necessary to produce textbooks are supplied domestically or imported. The supply system is established and there will be no problem with the supply of materials.

(2) There are enough number of staff members at the Janak Education Materials Centre and it is not necessary to increase the number of staff for this project. The work morale of the employees is high and there are experienced staff members who constitute a core of the operation and maintenance work. There is no problem with the operation and maintenance of equipment provided the workers are trained properly in the operation and maintenance of equipment.

(3) The Janak Education Materials Centre is an autonomous body and financed by the sales of textbooks on the market and the purchase by the government of textbooks for free distribution. The government will secure a budget for free distribution of textbooks. The price of textbooks is decided based on the production cost and there will be no serious problem with maintaining the operation budget.

In conclusion the project will bring about the effects as mentioned above and help the spread of basic and primary education and the improvement of people's life in Nepal. These benefits will justify to implement this project through a Grant Aid of the Japanese Government.

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CHAPTER 1 INTRODUCTION

Chapter 1 Introduction

His Majesty's Government of Nepal (abbreviated to HMG) gives priority to the expansion of education and has taken measures to spread and improve the basic and primary education. One of the priority measures is a project to increase the textbook production capacity of the Janak Education Materials Centre to meet the increasing demand for textbooks for the primary education. HMG has requested a Grant Aid of the Japanese Government for the equipment which is required for the textbook production in this project.

Upon this request the Japanese Government decided to conduct a basic design study on this project. The Japan International Cooperation Agency dispatched a basic design study team headed by Mr. Yasushi Hiroshige, the Deputy Director of the Textbook Division, Elementary and Secondary Education Bureau, the Ministry of Education, Culture and Science, Japan to Nepal from 27 October to 13 November 1992.

The study team had a series of discussions with the authorities in Nepal concerned about this project and visited the Janak Education Materials Center and other related institutions. The team collected necessary information and studied the scope of cooperation, the activities of the Janak Education Materials Centre, outlines of the request, the arrangement of the implementation in Nepal, the maintenance and operation plan, and the scopes of work and so forth. Upon returning to Japan, the study team has selected adequate equipment, estimated the project costs and drawn up an implementation plan based on its study in Nepal.

The report summarizes selection of adequate equipment, a basic design, a project implementation plan, a maintenance and operation plan, an evaluation of the project and some suggestions. The minutes of discussions, a list of study team members, the itinerary and a list of persons interviewed are appended to the end of the report (Appendix 1-4).

CHAPTER 2 BACKGROUND OF THE PROJECT

Chapter 2 Background of the Project

2.1 Primary and Secondary Education in Nepal

Expansion and systematic development of education in Nepal started in 1951 at the time of the Restoration. The National Education System Plan (NESP) was formulated in 1971 and school curricula and textbooks were made uniform throughout the Kingdom in the course of implementation of the new curriculum. In 1981 the primary education was extended from three years to five years. The present primary and secondary education system provides five years of primary education (Grades I-V)and five years of secondary education (Grades VI-X). The secondary education is divided into two stages: two years of lower secondary education and three years of upper secondary education. Students who pass the School Leaving Certificate (SLC) examination after Grade X are eligible to enter the higher education system.

The numbers of schools and enrollment have rapidly increased through such expansion and systematization of education. Curricula and textbooks have been standardized. One of the objectives to spread primary education is to raise the literacy rate. Now Nepali is used in education. In 1977 a free education system was introduced in primary education. In 1980 free distribution of textbooks started for students of Grades I, II and III. In 1987 the free distribution system was extended to girl students of Grades IV and V as well as the boys of the same age group in 18 remote districts of the country. The government is planning to extend the free textbook distribution to all the male students of Grades IV and V in 1997 and all the students of public primary schools are to be provided textbooks free of charge then. Table 2.1 shows the budget allocation to the education sector. It is seen from the Table that the budget to primary education receives a high share.

These measures on education have resulted in the remarkable increase of primary and secondary schools, teachers and students. Education have spread significantly as seen from Table 2.2.

Table 2.1 Total Allocated Budget (Regular and Development)

(in thousand Rs.)

	1986		1988		1990	
	Amount	%	Amount	%	Amount	%
1 Primary Education	442,369	30.70	623,503	38.37	967,119	46.37
2 Lower Secondary & Secondary Education	188,868	13.11	215,705	13.27	287,673	13.79
3 Adult Education	4,224	0.29	4,462	0.27	8,268	0.40
4 Curriculum, Textbooks, & Educational Materials	17,230	1.20	34,838	2.14	62,576	3.00
5 Physical Education & Sports	10,905	0.76	52,804	3.25	74,068	3.55
6 Miscellaneous Education Project	3,255	0.23	96,125	5.92	*	*
7 Education Administration	46,248	3.21	56,848	3.50	65,241	3.13
8 Education Research & Statistics	115	0.01	115	0.01	190	0.01
9 Scholarship & Student Welfare	5,526	0.38	7,408	0.46	4,796	0.23
10 Supervision, Training, & Publicity	3,011	0.21	7,302	0.45	8,639	0.41
11 Archaeology	5,834	0.40	10,024	0.62	10,865	0.52
12 University	614,524	42.65	379,742	23.37	465,937	22.34
13 Science & Technology	28,352	1.97	82,493	5.08	43,800	2.10
14 Integrated Rural Development	13,977	0.97	8,679	0.53	*	*
15 Cultural Development	817	0.06	100	0.01	998	0.05
16 Technical & Vocational Education	15,508	1.08	26,927	1.66	32,732	1.57
17 Others	39,954	2.77	17,979	1.11	52,667	2.53
Total	1,440,717	100.00	1,625,054	100.00	2,085,569	100.00

* Included in "Others"

Source: Ministry of Education and Culture: educational statistics (1990)

Table 2.2 Education Data on School, Student, and Teacher

	1981(2038) Total	1986(2043) Total	1987(2044) Total	1988(2045) Total	1989(2046) Total	1990(2047) Total
School						
Primary	10,628	12,186	12,491	13,488	15,834	17,842
Lower Secondary	2,786	3,729	3,824	3,857	3,941	3,964
Secondary	918	1,411	1,501	1,638	1,791	1,953
Student						
Primary	1,388,001	1,857,658	1,952,504	2,110,556	2,526,147	2,788,644
Lower Secondary	169,564	271,244	289,594	305,409	325,237	344,138
Secondary	144,331	268,805	289,923	307,534	338,779	364,525
Teacher						
Primary	29,134	53,405	55,207	57,204	63,945	71,213
Lower Secondary	12,245	12,529	11,744	11,989	12,245	12,399
Secondary	4,909	9,256	8,918	9,143	10,207	10,421

Source: Ministry of Education and Culture: Educational Statistics (1990)

However, there are still many problems with education in Nepal.

1) The literacy rate is still as low as 36 % (in 1990). Especially the literacy rate of women is as low as 18 % while that of men is 52 %.

2) The participation rate at primary education level has increased much and the statistics shows it as 107 % in 1990. However, the Basic and Primary Education Project, 1992 of the World Bank reports that only half of the boys and one third of the girls of school ages (6-10) are enrolled. Furthermore, those who proceed to Grade II from Grade I are not many. There are many repeaters and dropouts.

3) Enrollment of girls is still low.

4) Classrooms in primary schools are not enough to accommodate the increasing students.

5) Teaching is not adequate and the quality of teachers is low. The quality of education has not yet been improved.

6) The textbook contents are outdated. The design of textbooks is poor.

In these circumstances, important policy objectives of the government are to make basic and primary education accessible to all and to increase the literacy rate, and to enhance the efficiency and quality of the education sector. In order to achieve these policy objectives, HMG gives a priority to the development and expansion of primary education and has started many programmes for the development and improvement of curriculum, the development of textbooks and teaching materials, teacher training, construction and reconstruction of primary school buildings and so forth.

2.2 Outline of Related Projects

2.2.1 Eighth Plan (1992-1997)

(1) Objectives and Priorities of Eighth Plan

HMG announced the Eighth Plan (1992-1997) in December 1991. The plan aims at an annual GDP growth rate of 5.1 % and creation of 1.4 million job opportunities. It aims at not only the economic growth but also sustaining growth by means of social reform and improvement of management placing emphasis on maintaining a minimum living standard in rural areas. Priorities are given to development of rural infrastructures such as roads and irrigation facilities, improvement of agricultural technology, creation of employment opportunities, and provision of such basic services in rural areas as education, health services, drinking water and houses. Seventy percent of the total development budget is allocated to the development of rural areas.

The principal objectives that the Eighth Plan seeks to achieve are:

a. Sustainable Economic Growth

The present population of the country is already placing excessive demands on existing bio-physical resources. Therefore, a reduction in the rate of population growth is highly essential to achieve the objectives of sustainable economic growth.

b. Alleviation of Poverty

Of the factors causing poverty, the basic cause contributing to poverty is the dependence of the growing population on scarce economic resources. The Eighth Plan aims at implementing social programmes targeted to raise the people's living below the poverty line.

c. Reduction of Regional Imbalances

Disparities between rural and urban areas and among various development regions have increased. For the economic enhancement of underdeveloped areas, the provision of social, economic and market services and the access to facilities like drinking water and alternative forms of energy will be increased.

Given the limited financial, human and institutional resources of the country, the Eighth Plan gives priorities to the following activities.

a. Agricultural Intensification and Diversification
b. Energy Development
c. Development of Rural Infrastructures (such as construction of schools)
d. Employment Generation and Human Resources Development (such as expansion of basic education and technical and vocational training opportunities in rural areas)
e. Reduction in Population Growth
f. Industry and Tourism Development
g. Export Promotion and Diversification
h. Macro Economic Stabilization
i. Administrative Reform
j. Monitoring and Evaluation

The total and sectoral investment requirements for the Eighth Plan are estimated as shown in Table 2.3. The share of agricultural sector is the biggest as in the Seventh Plan. The share of the social services sector (education, health services, drinking water etc.) will increase to 7.6 % from 6.8 % in the Seventh Plan. Sixty four percent of the total gross fixed investment will be invested by the private sector while the remaining 36 % will be invested by the government sector.

Table 2.3 Total and Sectoral Investment Requirements
(in millions of rupees at 1991/92 prices)

	Seventh Plan (1985 - 90)		Eighth Plan (1992 - 97)					
					Private		Government	
	Amount Rs.	Share (%)	Amount Rs.	Share (%)	Amount Rs.	Share (%)	Amount Rs.	Share (%)
Agriculture, Irrigation & Forestry	25,270	24.5	43,876	25.8	27,512	25.2	16,364	26.8
Industry and Mining	7,572	7.4	14,925	8.8	13,689	12.5	1,236	2.0
Electricity, Gas & Water	17,246	16.7	27,668	16.2	8,631	7.9	19,037	31.1
Construction	3,382	3.3	5,072	3.0	5,072	4.7	0	0.0
Trade, Hotel & Restaurant	2,678	2.6	6,581	3.8	6,009	5.5	572	0.9
Transport & Communication	15,881	15.4	26,119	15.3	11,281	10.3	14,838	24.3
Finance & Real Estate	23,970	23.3	33,184	19.5	33,184	30.4	0	0.0
Social Services	7,015	6.8	12,907	7.6	3,815	3.5	9,092	14.9
Total	103,014	100.0	170,332	100.0	109,193	100.0	61,139	100.0

Source: National Planning Commission: Eighth Plan (1992 - 1997)

The sectoral allocation of development outlay in the Eighth Plan is shown in Table 2.4. The agricultural sector (agriculture, irrigation and forestry) and the social services sector (education, health services, housing, drinking water etc.) will receive a higher share (25.7 % and 31.5 % respectively). The investment by the government sector shown in Table 2.3 covers 54 % of the development outlay. Of the allocation of 35,408 million rupees to the social services sector, 17,290 million rupees are allocated to education and culture.

Table 2.4 Sectoral Breakdown of Development Outlay
(in millions of rupees at 1991/92 prices)

Item	Amount(Rs.)	Share(%)
1. General Administration	170	0.15
2. Economic Administration & Planning	133	0.12
2.1 Planning Commission	56	0.05
2.2 Statistics	77	0.07
3. Social Services	35,808	31.56
3.1 Education & Culture	17,290	15.24
3.2 Health	5,466	4.82
3.3 Local Development	4,010	3.53
3.4 Housing & Drinking Water	8,577	7.56
3.5 Other Social Services	465	0.41
4. Economic Services	77,368	68.17
4.1 Agriculture	10,947	9.65
4.2 Water Resources	35,802	31.54
4.3 Land Reform & Survey	791	0.70
4.4 Forestry & Environment	5,372	4.73
4.5 Industry	2,245	1.98
4.7 Other Economic Services	2,181	1.92
Total	113,479	100.00

Source: National Planning Commission: Eighth Plan (1992 - 1997)

(2) Policies and Plans in Education Sector

The education sector is placing emphasis on the policies to provide all the children of age 6-10 with primary education by the year 2000. Policies and plans on primary education in the education and culture sector of the Eighth Plan which are related to this project are as follows.

Objectives

- To make basic and primary education accessible to all and to increase the literacy rate.

- To enhance efficiency of the education sector and to raise the quality of education.

Policies

- Expansion of basic and primary education.

- To empower local bodies to enforce free and compulsory primary education.

- To extend non-formal education to increase the literacy rate.

- To improve quality of teaching methods, to upgrade physical facilities of schools and to expand the teacher training programme.

- To give priority to the appointment of female teachers in primary schools in order to increase the participation of women in education.

Targets and Programmes

- To achieve the national target of providing primary education to all by the year 2000, net enrollment rate of the primary school going age group 6-10 will be increased to 90 % . For this purpose, 2,035 primary schools and 8,000 teachers will be added, and 35,000 teachers will be trained.

- In order to raise the enrollment of girls, special programmes such as scholarships for the distribution of school uniforms to girl students and teacher training for women teachers will be implemented. A policy will be adopted to accord priority to the appointment of female teachers in primary schools. The appointment of at least one female teacher will be made compulsory in the primary school.

Implementation

- Compulsory primary education will be introduced on an experimental basis in some areas upon the demand and initiation of the local bodies of the respective areas.

- Literacy programmes will be carried out on a campaign footing to reduce widespread illiteracy.

2.2.2 "Basic and Primary Education Project"

The objectives of educational and cultural policies of HMG are to increase the literacy rate rapidly making basic and primary education accessible to all and to enhance the efficiency and quality of the education sector. To achieve these objectives HMG launched the Primary Education Project (PEP 1989-1992). The PEP has implemented construction and restoration of schools in six districts, teacher training, a non-formal education programme and developed new textbooks supported by the World Bank, international organizations and various countries. Following the PEP, HMG has started "Basic and Primary Education Project (BPEP, 1992-2000)" extending to the concept of PEP. The Basic and Primary Education Project consists of the following three components.

a. Improvement of the Quality of Basic and Primary Education

- Curriculum Development.
- Textbook Development.
- In-service Teacher Training (training using the new curriculum and textbooks).
- Additional Teacher Recruitment, especially Women Teachers

b. Increasing Access to Basic and Primary Education

- Access to Non-Formal Primary Education.
- Primary School Construction.

c. Institutional Development of Basic and Primary Education

- Programme Management of the Ministry of Education and Culture.
- Development of Primary School Design Capacity.
- School Facilities Construction Programme Management.

As seen from the above, the Basic and Primary Education Project comprises all components of the basic and primary education envisaged by HMG. The World Bank, ADB, UNICEF, UNDP, JICA and DANIDA are supporting this project. The World Bank completed the project report in March 1992 and decided its support in August 1992.

2.3 Necessity of Increasing Textbook Production

2.3.1 Production and Distribution of Textbooks

It was after the unified education target was set up in the National Education System Plan in 1971 that a standard curriculum and textbooks were adopted in Nepal. Curricula of primary and secondary education are made by the Curriculum, Textbook, Supervision and Development Centre (CTSDC). The development and revision of curriculum is made by the Curriculum Sub-Committe consisting of experts by subject. The curriculum is approved by the Curriculum Coordination Committee consisting of senior staff of the Ministry of Education and Culture and educational experts. Implementation of the curriculum is done by the CTSDC. The curriculum is revised approximately every ten years. The previous revision was made in 1981 and a new revision is now in progress.

The preparation of textbooks includes writing of new textbooks and revision of the current ones. Manuscripts prepared by writers are evaluated by the evaluation committee. The textbooks evaluated are edited by the CTSDC and then printed and bound by the Janak Education Materials Centre. All the textbooks for primary and secondary education had been produced in the above mentioned process. However, since the start of the Basic and Primary Education Project (BPEP), the BPEP is in charge of writing and editing of primary education textbooks and the CTSDC is in charge of the secondary education textbooks. The working group of the BPEP is working in the CTSDC and its function is complementary to that of the CTSDC. The CTSDC is located next to the Janak Education Material Centre and is training teachers (more precisely training of trainers of teachers) as well.

Following the revision of the primary school curriculum and textbooks, new textbooks for Grades I, II and III have been produced. New textbooks for Grade I will be used throughout the country in 1993 after a trial use in schools in some areas. The transition to the new textbooks for up to Grade V will be completed in four or five years.

The current textbooks are about 154 x 210 mm (equivalent to A5) in size. This size is too small for lower grade students of primary school. The letters are small and pictures and figures are not well discernible. The BPEP tried out two sizes of textbooks in some districts and the size of 240 x 180 mm (equivalent to B5) was found to be adequate. This size has been adopted. The covers had been in a single colour. The new textbooks use two colours on covers. The textbooks prescribed to Grades I, II and III were two kinds; the Nepali and mathematics. In the new curriculum a textbook for social studies has been added. Therefore the necessary quantity of textbooks has increased.

The Janak Education Materials Centre is also distributing textbooks. Textbooks are distributed from five branch offices to schools and students directly or through the general agent, SAJHA. The distribution cost is taken into consideration when setting the price of textbooks and about 20 % of the price is apportioned to it.

The Janak Education Materials Centre is planning to start printing new textbooks as the BPEP progresses. It is already printing new textbooks for Grade I. But the size remains the same as before because the existing facilities have difficulty in printing in the new size.

2.3.2 Demand for Textbooks

HMG is extending gradually the free distribution of textbooks to increase the enrollment in primary schools. Textbooks have been distributed free of charge to the students of Grades I,II and III since 1980. In 1987 the free textbook facility was extended to the girl students of Grades VI and V as well as the boys of the same age group in 18 remote districts of the country. These policies have resulted in the increase of enrollment and the demand for textbooks (output) as seen from the following figures.

1975	2,148,000 books
1981	5,767,000 books
1987	7,077,000 books
1989	9,299,000 books
1991	10,190,000 books

The production of textbooks in 1992 reached 12 million books combined for primary and secondary education. The demand for textbooks will grow for the following reasons.

- Increase of the population of the school age group.
- Increase of enrollment.
- Increase of subjects which use textbooks.

The government is planning to extend the free text facility to all the male students of Grades IV and V in 1997 and all the students of public primary schools are to be provided textbooks free of charge then. Textbooks prescribed to Grades I, II and III will be increased from two books to three.

The demand forecast envisaged by the Ministry of Education and Culture in November 1991 is given in the following table.

1991	12,124,000 books	
1993	14,007,000 books	(16,064,000)
1995	16,319,000 books	(20,737,000)
1997	18,677,000 books	(24,105,000)
1999	21,230,000 books	(29,167,000)

The figures in parentheses are the revised forecast made in May 1992. There are discrepancies between these two figures, but the demand will increase by 1.5 to 2.5 times either way in five or six years. The 1990 forecast predicts an annual increase rate of 7.3 % during 1991 - 1999 and the demand in 1999 will be 1.75 times that in 1991. Since there are no reliable statistics on populations by age, enrollment, dropouts etc., it is difficult to predict quantitatively the effect of the government policy. The demand increased from 7.1 million books to 10.2 million at an annual rate of 9.5 % in five years from 1987 to 1991. Since the education policy is being carried out energetically, the demand for textbooks will increase as predicted in the 1990 forecast or more.

2.3.3 Reuse of Textbooks

HMG has been spending a huge amount of money for free distribution of textbooks. Such expenses could be curtailed if the textbooks distributed at the beginning of the session could be collected at the end of session and redistributed to other students in the next session. The World Bank recommends reuse of textbooks for the reason that effective use of textbooks and reduction of distribution costs could reduce the education budget.

However, HMG is of the opinion that reuse of textbooks is difficult to be realized for the following reasons.

- Production of textbooks of the quality which permit reuse entails more money.

- There are no storage facilities in schools to store textbooks to be reused.

UNICEF which strongly supports the basic and primary education programmes of Nepal is also of the opinion that the reuse of textbooks is difficult for the following reasons.

- Binding of textbooks must be stronger.

- Workbooks must be provided so that students may not spoil textbooks by writing notes on them. However, this costs much.

- Textbooks are the only books in rural areas and they play an important role in education of not only students but also their families by keeping them.

- The physical distribution and storage cost much. The administration to keep textbooks in order such as keeping a record is complicated.

HMG and UNICEF are of the opinion that reuse of textbooks recommended by the World Bank is at present not realistic. The present physical quality and use of textbooks will not allow reuse of textbooks for some time.

HMG will reform the free distribution system in 1993. In the revised system parents will buy textbooks and HMG will refund upon the submission of the receipt. This approach is expected to promote more careful use of textbooks because parents pay for once. This new system will start in 1993 although it may cause some problems. Any defects will be corrected if some difficulty comes out.

2.4 Janak Education Materials Centre

2.4.1 Outline

The Janak Education Materials Centre was established in 1958 to print textbooks. It is a public limited company owned by the government and under the jurisdiction of the Ministry of Education and Culture. The Centre is the sole factory in Nepal which produces textbooks for public primary and secondary schools and guidebooks for teachers. Since the start of the National Education System Plan (NESP) in 1971, its activities have been expanded. It is also producing guidebooks for teachers and other teaching materials beside textbooks. However, the printing facilities of the Center are those installed at its inception and many are obsolete. The existing facilities are grouped into the following two.

- Facilities for letter press printing installed in the old building at the time of the inception: At present they are used to print others than textbooks.

- Facilities for offset printing installed in the new building since the latter half of 1970's : They are used for printing and book binding of textbooks.

At present the textbook production is being made using the facilities of offset printing presses and book binding machines in the new building. The facilities were installed separately without consideration of the whole layout. Supply of parts and consumables is not adequate. The operation efficiency is not good. The production capacity is 9.5 million books per year. The facilities will continue to be used.

An organization chart of the Centre is shown in Fig. 2.1. The Centre is headed by the Chairman-cum-General Manager assisted by the Deputy General Manager. There are eight divisions: Administration, Financial Control, Planning and Quality Control, Publication, Product Design and Preparation, Service and Maintenance , Marketing, and Science Equipment Division. There are 459 regular staff members, 132 temporary employees and 112 part time employees, the total being about 700. The Publication Division is a main and the biggest division, and is responsible for printing and book binding of textbooks. The Services and Maintenance Division is responsible for the maintenance of equipment. The Product Design and Preparation Division is in charge of compilation of manuscripts and production of black copies and has 21 staff members including designers.

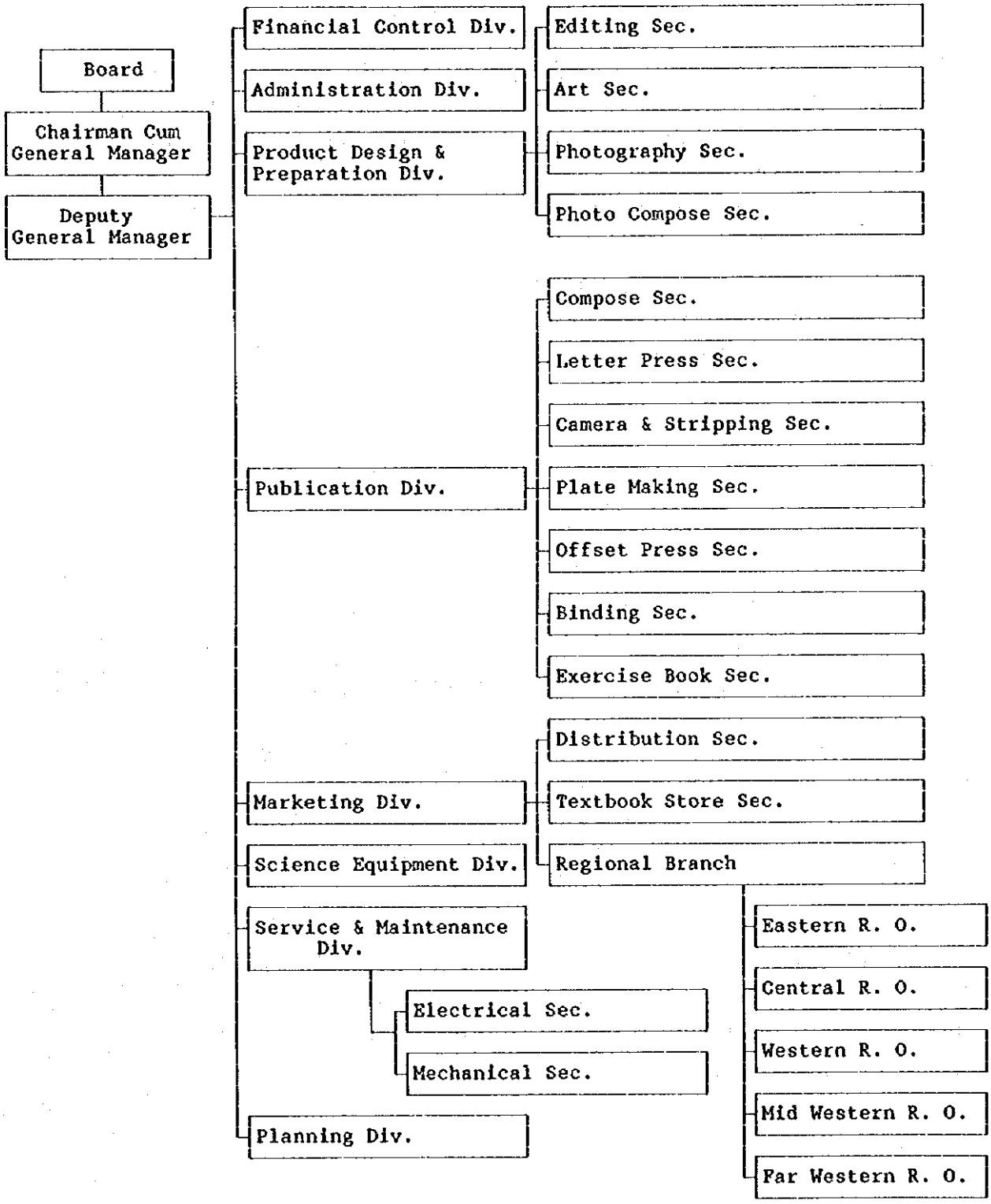
The Marketing Division is in charge of the distribution of textbooks and has five regional offices in the country. There are 47 staff members. The system of distribution is different for free textbooks and charged textbooks.

- Free distribution: In 61 districts, textbooks are distributed through the general agent SAJHA from each regional office. In other districts, they are distributed to schools through the education office in each district.

- Charged textbooks: The general agent is SAJHA. In urban areas each regional office sells textbooks by wholesale to SAJHA and other retail shops. In rural areas which have no retail shops orders are placed with the agent.

The Deputy General Manager (majored in mechanical engineering and 12 years with the Centre), under the supervision of the General Manager (majored in business administration), is responsible for the overall planning and operation of the Centre.

Fig. 2.1 Organization of Janak Education Materials Centre



The sales, costs and profits of the Centre in the past five years are as follows.

(Unit: 1,000 Rupees)

	1987	1988	1989	1990	1991
Printing Income	10,874	14,418	20,110	27,332	21,568
Sales	27,987	29,801	49,674	62,582	69,572
Total Production Cost	17,113	15,383	29,564	35,250	48,004
Other Income	5,964	4,908	6,359	8,957	7,947
Total Income	16,838	18,726	26,469	36,289	29,515
Total Expenditure	12,222	13,395	22,676	31,527	28,229
Tax and Bonus	2,835	3,027	2,965	3,314	799
Net Profit	1,781	2,304	828	1,448	487

2.4.2 Operation

The present situation of textbook production of the Centre is mentioned as follows.

(1) Production Facilities

1) The efficiency of facilities is low because the maintenance is not good and the factory is not well arranged.

2) Some machines remain out of order and in stoppage because of lack of parts. For example, some old folding machines are left idle without being repaired because the necessary parts are not available and folding operation is being done manually. Signatures folded manually are causing the reduction of efficiency and productivity of book binding and the deterioration of the quality.

3) Some machines are working but their yield and productivity are very low because of lack of parts. For example, in some printing presses feed of paper is not smooth because not only the paper quality is low but also the grippers have not been replaced. This is causing a lot of defective products. The folding machines and gathering machines often stop because of low quality of signatures and deterioration of machine parts.

4) Printing paper is weak and fragile since it is made from straw. Since packing is rough and sheets of paper are loaded and unloaded by human power, they are easily disarranged, crumpled and turned back.

5) The machines often stop because of the poor working conditions due to lack of parts and the low quality of paper. To readjust the stopped machines to make them start again many workers must be always attending on the machines. Although the wages are low, the proportion of personnel expenses in the total cost becomes high.

6) It is difficult to improve the existing facilities and to maintain the present production capacity with the existing facilities.

(2) Materials

1) Printing Paper

Printing paper is purchased by tender. Chinese and domestic paper is mainly used. The amount used is 1,800 tons per year (in 1992). The specification of printing paper is 60 g/m² and the price is 35,000 rupees/ton.

Since timber felling is prohibited in Nepal to protect forest resources, paper is made from wheat straw or rice straw. It is fragile. The quality varies widely because of poor quality controls in manufacturing, processing and transportation. Since the proportion of printing paper cost in the textbook production is high, price is a more determining factor than quality in the selection of paper.

2) Other Materials

Printing ink	:	Imported from India. The price is 130 rupees/kg (black), 200 - 450 rupees/kg (coloured)
PS plate	:	Imported from abroad. The price is 20,000 rupees / package (50 plates).
Hotmelt adhesive	:	Imported from India and Sri Lanka.
Film	:	Foreign products. The price is 20,000 rupees / package (100 sheets).

Materials except for printing paper mainly come from India. Materials from India are not so good in quality, but the prices are not high and hard currency is not required for purchase. To improve the quality of products it is advised to establish a way to get foreign materials other than Indian ones.

(3) Production Control

Production control of Japanese type is not practiced. The concept of quality guaranteed of products is poor. Even if conscious of the quality guaranteed, it is difficult to put it into practice because of the low quality of raw materials and deterioration of facilities. To produce a targeted amount precedes quality. Defective products are often included in finished products.

Techniques or ideas of production control are apparently not applied in the factory. Graphs or charts which show a target and achievement were not seen in the factory. Introduction of some techniques of production control will help significantly the increase of productivity and quality.

2.4.3 Plan for Increasing the Production Capacity

The present printing capacity of the Centre is 9.5 million books per year. This is less than 12 million books planned for 1992. To make up this difference the factory is on 24 hours work overtime. The present facilities can not meet the present demand, much less the projected demand mentioned in Section 2.3.2 "Demand for Textbooks". The present facilities neither can produce textbooks of new specifications (especially of new size) efficiently. To increase the production capacity is urgently needed.

For these reasons HMG has been studying a plan to increase the production capacity of the Janak Education Materials Centre since 1990. Major studies are listed as follows.

November	1990	Concept Proposal for Improvement of Educational Printing & Publishing Facility of Janak Education Materials Center was submitted.
April	1991	A UNICEF consultant reviewed the above mentioned proposal.
March	1991	A project report of the World Bank was submitted.
May	1991	Supplementary Report for Expansion and Modernization of Janak Education Material Centre was submitted.

The expansion plan has been built up through these processes and has resulted in this request.

The specifications of textbooks which are planned to be produced with new facilities are:

Size : 240 x 180 mm (equivalent to B5), until now 154 x 210 mm (equivalent to A5).

Colour: Text part in a single colour (black and white). Covers in two colours, until now a single colour.

Printing paper is purchased by international tender. At present two domestic paper mills are producing printing paper of 10 tons and 15 tons per day respectively. There is a plan to increase production. There is no problem with supply of printing paper. UNICEF is providing free of charge HMG with printing paper of 350 tons every year and will continue to provide the same amount for the coming five years.

One hundred eighty staff members of the Publication Division which is in charge of printing and book binding of textbooks are enough to operate the existing and new facilities. It is not necessary to increase employees to operate new facilities.

A new building (the extension block) will be built next to the existing new factory block to install new facilities. The extension block is already under construction. The voltage fluctuations and power failures in electricity and the water supply during the dry season have some problems, but supply capacity is enough in electricity as well as in water for the expansion of facilities.

2.5 Background and Outline of the Request

2.5.1 Background of the Request

His Majesty's Government gives priority to the development and expansion of primary education and started "Basic and Primary Education Project (BPEP)" with the support of the World Bank. A revision of curricula, the improvement of contents and specifications of textbooks, teacher training and classroom construction are being carried out within the framework of BPEP. The increase of enrollment is predicted. The demand for textbooks will increase with the increase of enrollment and revision of textbooks. The Janak Education Materials Centre is a public limited company fully owned by the government to produce and distribute school textbooks. The existing facilities of the Centre are rather old and replenishment of parts is not adequate. The rate of operation is lowering. The production capacity can not meet even the present demand for textbooks, much less the increasing demand. The Janak Education Materials Center prepared a proposal to expand the facilities for prepress, printing and book binding to meet the increasing demand for textbooks and submitted it to the Ministry of Education and Culture. HMG has requested the Japanese Government to provide a Grant Aid for the expansion of equipment planned in this proposal.

2.5.2 Outline of the Request

The outline of the request by the Nepal side is as follows.

(1) Objective

The objective is to expand the production capacity and to modernize facilities for prepress, printing and book binding of textbooks at the Janak Education Materials Centre in line with the plan of the expansion of production capacity of textbooks proposed by the Centre.

(2) Executing Agency

The executing agency is the Janak Education Materials Centre.

(3) Outline of the Activity

The equipment to be provided through this project will be used to produce textbooks for schools, particularly primary schools. The existing facilities of the Janak Education Materials Centre for printing and book binding of textbooks will continue to produce textbooks. Proper use of the newly equipped facilities and the existing facilities by the sizes and quantities of different kinds of textbooks will raise the overall production efficiency.

(4) The Equipment Requested

The equipment requested is the following twelve items.

Single Colour Sheet Fed Perfecting Presses	3
Single Colour Sheet Fed Press	1
Folding Machines	4
12-Station Gathering and Stitching Machines	2
Perfect Binding Machines	2
Paper Trimmer	1
Three-Knifed Trimmers	2
Vertical Compact Camera	1
Vacuum Printer	1
Plate Processor	1
Effluent Treatment Facility	1
Paper Lift (Fork Lift Truck)	1

CHAPTER 3 OUTLINE OF THE PROJECT

Chapter 3 Outline of the Project

3.1 Objective

His Majesty's Government of Nepal (abbreviated to HMG) gives priority to the improvement and expansion of primary education in the educational and cultural sector and has taken several measures to achieve this end. As the result of these measures, the attendance rate at the primary and secondary education level has increased and the demand for textbooks at these levels is increasing. However, the present insufficient production capacity of textbooks limits the spread of education and the improvement of the educational quality. HMG has drawn up a plan to expand the production capacity of the Janak Education Materials Centre to alleviate the shut supply of textbooks. The objective of this project is to improve and expand the facilities for prepress, printing and book binding at the Janak Education Materials Centre to increase its printing and book binding capacity.

3.2 Study and Examination on the Request

3.2.1 Propriety and Necessity of the Project

The present situation of the basic and primary education in Nepal is summarized as follows.

1) The participation rate at the primary school level is increasing, but access to basic and primary education is not yet to all. The literacy rate is low, especially that of women.

2) The enrollment in Grade I of primary schools is increasing, but the percentage of those who proceed to Grade II and above is low and many drop out. Of those who enroll, over 70 % drop out before completing the primary education.

3) To improve the quality of the primary education, HMG has started Basic and Primary Education Project (BPEP) for classroom construction, the development of curricula and textbooks, and teacher training, etc.

The Janak Education Materials Centre can not produce enough textbooks to meet the present demand, much less the projected demand in the Basic and Primary Education Project. The facilities are old, not well maintained and are not working efficiently. The present facilities have difficulty in producing textbooks of new size. It is highly necessary to install new equipment for prepress, printing and book binding which can produce efficiently textbooks of new specifications. This project aims at expanding equipment to increase the production capacity of textbooks in Nepal. The project will have direct effect on the improvement of teaching by teachers and of learning by students. Indirectly it will contribute to increasing the literacy rate and to the improvement of the quality and efficiency of education. These benefits will justify to implement this project, accordingly the implementation of the project should have high priority.

3.2.2 Study on the Implementation Plan

The Janak Education Materials Centre which will execute this project is producing textbooks and its production system is already established. It is the Deputy General Manger who is studying a plan of increasing the production capacity under the supervision of the General Manager.

Of the equipment to be provided through this project, equipment for prepress and printing will be installed in the new factory block and equipment for book binding in the extension block which is being built for this purpose. The extension block will be built on the south of the new factory block. The design and the construction contract were already completed and the building is under construction. The construction budget has already been earmarked and the construction is expected to be completed by the end of October 1993.

There are enough staff members for textbook production and it is not necessary to increase the size of staff for this project. Installation of new equipment does not cause the increase of personnel expenses. The will to work of the employees is relatively high. Since the Centre has a history of more than 20 years, there are enough number of experienced workers in production and maintenance. However, it is necessary to train the staff in the operation and maintenance of new equipment since the existing facilities are of old type. There will be no problem with the implementation of the project in view of the ability of the management and the quality and quantity of the staff members.

The Centre is an autonomous body. The main income source is sales of textbooks. The cost for free distribution of textbooks is covered by the HMG budget. The HMG budget will increase as the free distribution of textbooks scheme expands. The priced textbooks are on sale at markets. The price of textbooks is decided based on the production costs. Therefore, the Centre is operated in a sound financial environment.

As seen from what mentioned above, it is considered that there is no problem with the implementation of this project.

3.2.3 Study on the Related Projects

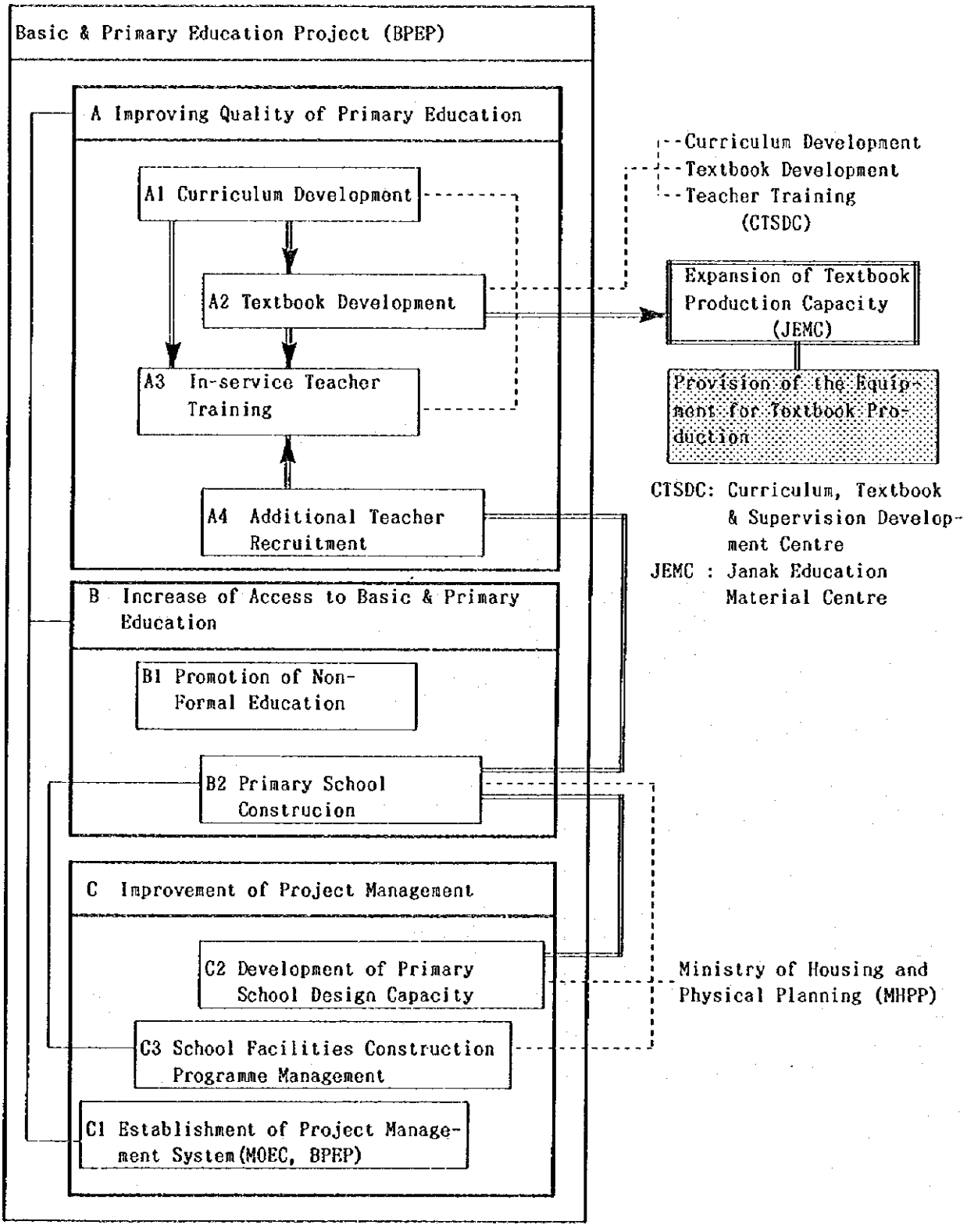
The World Bank supports the Basic and Primary Education Project (BPEP) in collaboration with international organizations such as ADB and UNICEF and other aid countries (including Japan). This project is closely related to BPEP. Not only Ministry of Education and Culture but also the World Bank, UNICEF etc. have much expectation of the project.

3.2.4 Study on the Components of the Project

This project is a project which solely aims at improving equipment for production of textbooks. The Nepal side is hoping a technical cooperation assistance after the installation of equipment. However, a technical cooperation assistance must be requested separately and is not a component of this project.

This project is closely related to each sub-project of the Basic and Primary Education Project (BPEP). Fig. 3.1 shows the relation of this project with BPEP. This project supports BPEP in the production of textbooks.

Fig. 3.1 Relationship between the Project and Basic & Primary Education Project



3.2.5 Study on the Equipment Requested

(1) Outline of the Equipment Requested

Equipment requested by the Janak Education Materials Centre is described in Section 2.5.2 'Outline of the Request'. The requested are facilities for prepress, printing , book binding and other related operations. Requested items are listed in Table 3.1 for the three categories as mentioned above. Items with *(asterisk) are those confirmed newly at the time of this study. A flow chart of the textbook production in this project is shown in Fig. 3.2. Outlines of equipment are described for each process in the flow chart.

Table 3.1 Equipment Requested

A. Facilities for Prepress Process

Vertical Compact Camera	1
Film Processor *	1
Vacuum Printer	1
Plate Processor	1
Plate Punch *	1
Effluent Treatment Facility	1

B. Facilities for Printing Process

Single Colour Sheet Fed Perfecting Presses	3
Single Colour Sheet Fed Press	1

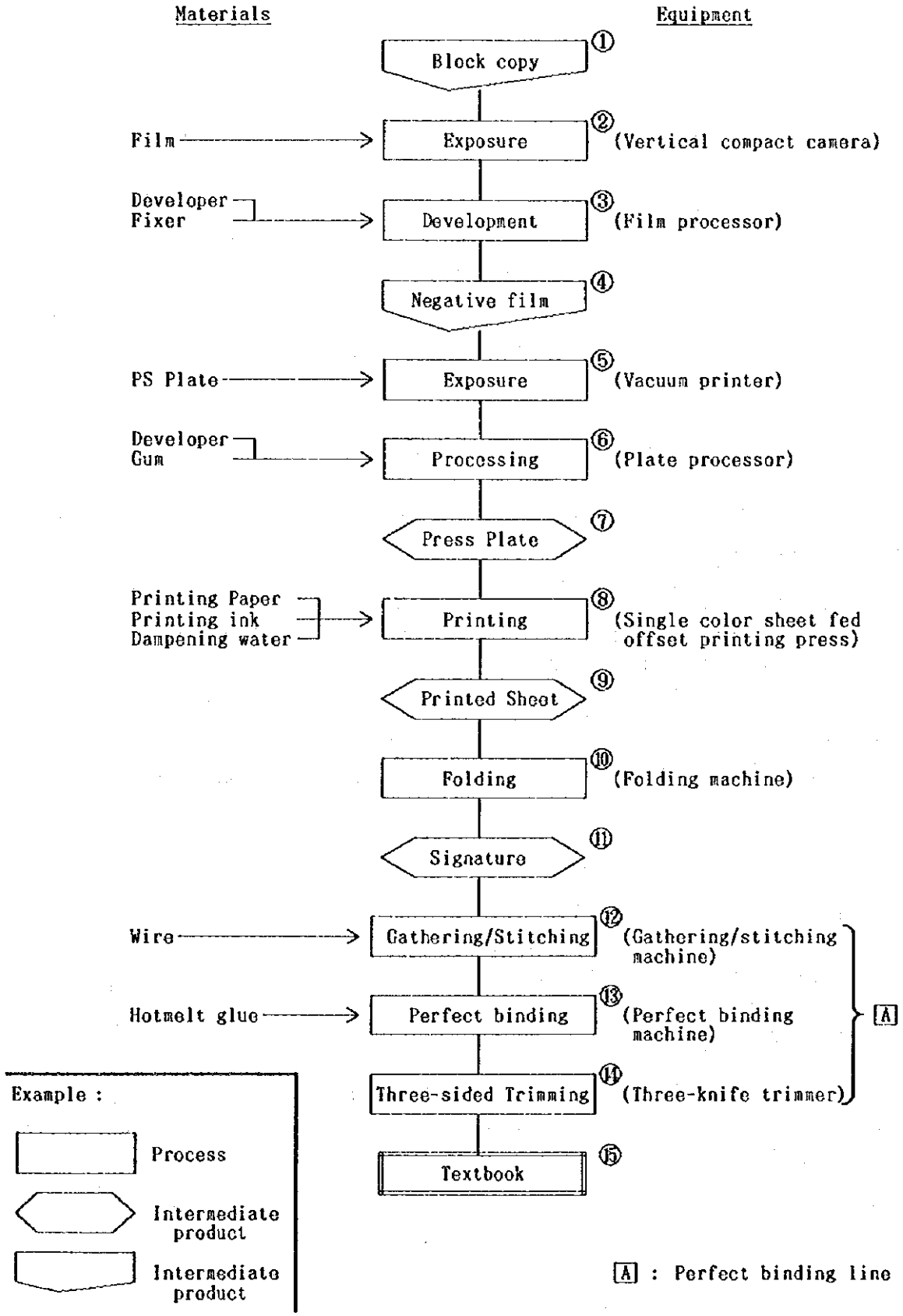
C. Facilities for Book Binding and Others

Folding Machines	4
Perfect Book Binding Line**	1 line
Paper Trimmer	1
Knife Grinder *	1
Jogging Machine *	1
Paper Lift	1

* Equipment which was requested at the time of this study

** To compose one line connecting a gathering and a stitching machine, a perfect binding machine and a three-knifed trimmer.

Fig. 3.2 Flowchart of Textbook Production



A. Facilities for Prepress Process

The vertical compact camera, film processor, vacuum printer, plate processor and plate punch are necessary for preparatory work before printing such as preparation of a press plate. The quality of printed sheets depends much on the quality of the press plate. In the textbooks of Japan there are many coloured pages and photographs, but in the textbooks of Nepal almost all pages are in a single colour and photographs are few. Therefore, the study is based on the equipment requested by the Nepal side. The effluent treatment facility is for the treatment of used development and fixing solutions. Since the amount of solutions which are used in the prepress process is decreasing owing to the improvement of development processors, this project has selected equipment which recovers unused silver in the used solutions.

B. Facilities for Printing Process

Single colour sheet fed perfecting presses and a single colour sheet fed press are included in the request. The single colour sheet fed perfecting press is used for printing the text part of textbook and main in the printing process. The single colour sheet fed press is used for printing of supplementary part such as covers of textbook. Since printing paper is supplied in a form of cut sheets of paper in this project, sheet fed presses have been selected. Three single colour sheet fed perfecting presses and one single colour sheet fed press are requested. The number of presses are decided considering the capacity of facilities in the book binding process.

C. Facilities for Book Binding Process and Others

The folding machine, gathering machine, side stitching machine and three-knifed trimmer are main facilities for book binding. Four of folding machines, two of gathering machines, two of side stitching machines and two of three-knifed trimmers are requested. These numbers are decided taking into consideration a balance between each machine's capacity and the whole capacity of all the processes.

In Nepal there are problems with types of packing of printing paper. Printing paper must be arranged neatly in position before printing. The paper trimmer and jogger are used to cut paper in proper size and arrange cut paper neatly before printing.

At present printing paper, printed paper and products (textbooks) are carried mainly by porters. This tends to cause loss of paper. That is the reason why a fork lift truck is requested.

(2) Study of the Equipment Requested and Selection

In the selection of equipment, the following objectives of this project are used as criteria.

a. To be necessary to increase the production capacity of textbooks.

b. To be able to produce textbooks of new specifications.

c. To be necessary to produce textbooks efficiently or to maintain properly the production facilities.

d. To be able to operate with ease (technically easy to handle and economical).

The specifications of textbooks to be produced with the facilities to be provided through this project are as follows.

Size: 240 x 180 mm (equivalent to B5)

Colours: Text part a single (black and white) colour
Cover two colours

Pages: 56 - 236 pages (144 pages on the average)

In the Basic and Primary Education Project, the size of textbooks for low grades of primary schools has been studied to make it easier to use and it has been decided to make the size of textbooks larger than the current one. The new size is 240 x 180 mm. However, since the production will go down drastically when textbooks of size 240 x 180 are produced with the current facilities, the textbooks of current size are still being produced. The equipment which is provided through this project is required to be able to produce textbooks of new size efficiently.

The new production line will produce about 10 million textbooks a year. The total production together with the existing facilities will be about 20 million textbooks a year. This total will amount to 1.7 times the demand of 12 million volumes in 1992. The operating capacities of printing presses, folding machines and binding equipment to be provided through this project are shown in Table 3.2. The operating capacity of equipment is calculated on the following operating conditions.

Operation hours per day (in two shifts): 10 hours
Actual operation hours, that is, 14 working hours minus time for preparation, halt of machines etc.

Operation days of printing presses per year: 265 days
295 working days minus 30 days for repair.

Operation days of folding machines and book binding per year: 295 days
The same as the working days.

The operating capacity of facilities per unit hour is estimated based on the amount and quality of materials (printing paper etc.) and the working conditions. It is not that in a catalogue of machines.

Table 3.2 Capacity Calculation of Printing Press, Folding Machine and Perfect Binding Line

1. Printing Press

	Production Capacity (sheets)		
	Per hour	Per day 1)	Annual capacity 2)
1-1 Perfect Printing Press (728 x 1,030)	7,800	78,000	20,670,000
1-2 Single Side Press (515 x 728) (as of 728 x 1,030)	(7,800)	(78,000) 19,500	5,168,000
Total annual capacity (as of 728 x 1,030) 20,670,000 x 2 + 5,168,000 x 1			= 46,508,000 sheets
Total pages (180 x 240) 46,508,000 x 32			=1,488,000,000 pages
Total books (average 144 pages/book) 1,488,000 ÷ 144			= 10,335,000 books

2. Folding Machine

	Production Capacity (signatures)		
	Per hour	Per day 1)	Annual capacity 3)
	3,600	36,000	10,620,000
Total annual capacity (32 pages/signature) 10,620,000 x 5			= 53,100,000 signatures
Total books (average 144 pages/book) 53,100,000 x 32 ÷ 144			= 11,800,000 books

3. Perfect Binding Line

	Production Capacity (books)		
	Per hour	Per day 1)	Annual capacity 3)
	4,000	40,000	11,800,000

Note: 1) Operating hour per day (2 shift) : 10 hours
2) Operation days per year : 265 days
3) Operation days per year : 295 days

The following are descriptions of the purposes of use of selected equipment.

1) Prepress Process

A. Purposes of Use

This process produces a press plate (a plate to be set on a printing press and to be used for printing) from a block copy (a copy of manuscripts of textbooks which is in a format ready for printing). It is divided into two processes; a process which prepares negative films for press plate from block copies and a process which makes a press plate for printing from the negative films. The negative films can be used many times as long as the contents of printing are not changed. The press plate wears out and must be made newly (exposed) after a certain number of sheets are printed or when it is removed from the press for changing works.

B. Necessary Equipment

Vertical Compact Camera (2 in the flow chart)

A camera is necessary to prepare a negative films for prepress from a block copy. There are several types of camera. A vertical camera which is suitable for the block copy to be used in this project and can be operated with ease is adequate.

Film Processor (3 in the flow chart)

A film processor is used to develop exposed films. Currently films are processed manually (in tray) and the quality of developed film is not good. The film processor in which development, fixing, washing and drying proceed automatically is more adequate in this project. The film processor less consumes development solutions and fixing solutions than the manual processing. It is also better in that it reduces costs for chemicals and less pollutes environment.

Vacuum Printer (5 in the flow chart)

The offset lithographic printing usually uses a PS plate (presensitized plate: aluminum plate coated with photosensitive emulsion). The vacuum printer is used to print the image of a negative film on the PS plate. In order to prepare a press plate which produces a good printed sheet it is important for the film and the PS plate contact closely at exposing. The vacuum printer is for this purpose.

Plate Processor (6 in the flow chart)

In order to use the contact-exposed PS plate as a press plate, it is necessary to develop the exposed part. After the development, the PS plate is washed, dried and coated with gum to protect it from deterioration caused by oxidation. The plate processor in which a processor, a gum coater and a plate discharging unit are connected together is recommended in this project.

Plate Punch

A pin system (to fit the pins of printing press into the pinholes in the press plate) is used to set properly the press plate onto a printing press. The plate punch is used to punch pinholes into the press plate.

Effluent Treatment Facility

The photographic film uses silver chloride and silver bromide for photosensitive emulsion. In the process of preparation of negative films for prepress, unused silver is solved in the fixing solution. This facility recovers electrically unused silver in the fixing solution. By recovering unused silver, resources are saved and the waste fluid is cleaned.

The monochrome scanner can produce better shades and contrasts of different colours than the camera. However, since there are not many coloured pages and photographs in the textbooks of Nepal, the vertical compact camera is adequate. A light table is available in Nepal and is not included in the request.

2) Printing Process

A. Purposes of Use

This is a process which produces printed sheets by printing letters, photographs, illustrations etc on printing paper and is main in the whole process of printing. Appropriate printing presses must be chosen depending on the type of printing paper to be fed, the kinds and specifications of work, the quantity of sheets to be printed in one lot. In this project, the purpose is mainly to make printing in a single colour (black and white) on printing sheets. Printing on covers and of coloured frontispieces must also be possible.

B. Necessary Equipment

Single Colour Sheet Fed Perfecting Press (8 in the flow chart)

This makes printing in a single colour on both sides of sheet at one time. This machine is suitable for printing efficiently the text part of textbooks in a single colour (black and white). It must be able to print 32 pages of 180 x 240 mm on both sides of a sheet at one time. The production capacity per one machine is about 20.67 million sheets (B1 size) per year.

Single Colour Sheet Fed Press (8 in the flow chart)

This makes printing in a single colour on one side of sheet. It can print in multicolours by making printing several times changing the colour of ink at each printing. It is suited for printing of covers and coloured frontispieces. It must be able to print 8 pages of 180 x 240 mm on one side of a sheet at one time. This machine is also used to produce 16-page sheet or 8-page sheet by making printing on one side first, then turning over the sheet and printing on another side. The production capacity per machine is 7,800 sheets (B2 size, one side) per day and this is equivalent to about 5.17 million sheets of B1 size per year.

Three single colour sheet fed perfecting machines and one single colour sheet fed machine are requested. However, two single colour sheet fed perfecting machines and one single colour sheet fed machine can produce 10 million books per year. To match with the capacity of book binding process, the quantity of perfecting machines are reduced to two.

Since the present situation requires mass production of textbooks in a single colour, printing presses for printing in two and more colours are not requested. Multicoloured printing is technically more complicated. All pieces of equipment requested are considered to be appropriate to meet the present need in Nepal.

3) Book Binding Process and Others

A. Purposes of Use

This is a process in which the final products, textbooks are produced from the printed sheets. It consists of mainly mechanical operations such as folding of a printed sheet, gathering, gluing on cover, trimming etc. It is important to make the operations from manual to mechanical in order to keep products uniform, to raise the efficiency of machines and to improve the quality of products.

Beside these facilities mentioned above, facilities which are used in common in all the processes or auxiliary equipment are necessary in order to produce textbooks efficiently. They are facilities necessary for the preparation of printing paper before printing, or necessary for loading, unloading and transporting printing paper and printed products. Equipment which keeps the voltage fluctuations within a certain range is also necessary to protect machines against damage in view of the electricity situation on the site.

B. Necessary Equipment

Folding Machine (10 in the flow chart)

This is equipment necessary to fold a printed sheet so that it can be set on the gathering machine. It produces a signature (a section made from one sheet folded) folding a printed sheet. At present there is only one folding machine which folds a sheet threefold and folding is being done by many temporary workers. Manual folding can not produce uniformly folded signatures. This often causes stopping of gathering machines and side stitching machines in the succeeding process. In order to increase the productivity of the whole process, it is necessary to produce uniformly folded signatures by means of folding machine. Four folds (32 pages) must be possible. The machine to which an apparatus to tie together a bundle of a certain quantity of signatures is attached is suitable for carrying signatures to the gathering machine.

Four folding machines are requested. The production capacity of folding machine depends on the quality and size of paper and the number of times of folding. In this project, it is estimated at about 10.62 million sheets per machine per year. Five machines are necessary to produce 10 million textbooks per year.

Perfect Book Binding Line (gathering, perfect binding and three-knife trimming) (12-14 in the flow chart)

The gathering machine is necessary to arrange signatures in consecutive order. Textbooks are wire stitched after gathering so that they can be good for rough use. After wire stitching, a cover is glued. After the glue is dried, a three-knife trimmer trims all three sides of a pile of books and final products, textbooks are produced. In the Janak Education Materials Centre the gathering machine, the side stitching machine and the trimmer are installed separately. In carrying products from a machine to another machine piles of signatures often collapse and loss is caused. In this project, these machines are connected by a conveyor and each operation proceeds to the succeeding one automatically to increase the productivity. This process allows automatically time for drying the adhesive.

Each two of gathering machines, side stitching machines and three-knifed trimmers are requested. Since the production capacity of one line is about 11.8 million books per year, one line in which one gathering machine, one perfect binding machine and one three-knifed trimmer are connected is selected in this project.

Paper Trimmer and Jogging Machine

The printing press and the folding machine will not work smoothly if the sheets of paper are not all the same size, the corners are not right angle or the edges of sheets do not true up when sheets of paper are set on these machines. A paper trimmer which cuts sheets of printing paper or printed sheets in exact size and trues up the edges of sheets and a jogging machine which arranges sheets of paper in position with a vibration system are necessary.

Knife Grinder for Paper Trimmer

If the blades of a paper trimmer are not sharp enough, printing paper or printed sheets can not be cut uniformly and the quality of products lowers and the production efficiency decreases. To maintain the blades of trimmer and three-knifed trimmer in good condition, it is necessary to grind them at regular intervals. The existing grinder has been worn out and the accuracy is low. It can not grind accurately. Since the paper size is larger than before in this project, a new grinder is necessary.

Tying Machine

It is important to prevent piles of signatures or textbooks from collapsing while carrying them in order to increase the yield rate of products and keep the factory in a neatly arranged state. At present products are piled in bulk and are easily damaged. The factory is not kept neatly arranged. This kind of loss can be reduced by tying together neatly a pile of signatures or products.

Paper Lift

Sheets of paper to be fed into a printing press or a folding machine must be arranged properly for these machines to operate without being interrupted. In order to increase the production efficiency, paper or paper products, which are very heavy, must be handled carefully when the printing paper delivered on a truck to the Centre from a paper mill is unloaded from the truck, when printing paper is carried to a warehouse or a printing factory and when produced textbooks are loaded on a truck for consignment. A paper lift (Fork lift truck) is important to keep the physical distribution in the Centre smooth and proper.

Hand Lift

It is important not to do damage to paper and products in loading and unloading or in transport of short distance in the Centre. At present products are carried by porters and often are crumbled or disarranged, loss being caused. In the factory buildings where a fork lift truck can not be used, a handy hand lift which is driven by human power will be very effective and convenient.

Automatic Voltage Regulator

In Nepal power failures often happen and the voltage fluctuations are relatively big. The control systems and other parts of facilities use electronic circuits although the use of electronic circuits are avoided as much as possible. Usually the voltage fluctuations within the range of ± 10 % are allowed for most machines. A voltage regulator is necessary to keep the voltage fluctuations within this range and to protect the facilities against damage caused by big fluctuations.

3.2.6 Study on the Necessity of Technical Cooperation

Technical cooperation is not requested with this project and is not prerequisit to this project. However, the Nepal side wants Japanese experts to come to Nepal for a short time and to send trainees to Japan. In view of the present situation of the Janak Education Materials Centre, it is recommended that the staff members are trained in printing technology, production control and management after the equipment has been installed if this project is realized. If it is possible to train the staff members at a printing factory in Japan and to send Japanese experts on prepress, printing and book binding to the Centre, it will help enhance the effect of this project.

3.2.7 Basic Policy on Implementation

The effect, feasibility and implementation capability of the Nepal side have been confirmed of this project as seen from the study as discussed above. The effect of this project is in line with the purpose of a Grant Aid of the Japanese Government. These considerations may justify to implement this project through a Grant Aid of the Japanese Government. Accordingly we examine outline of the project and conceive a basic design of the project on the assumption that the project will be carried out by a Grant Aid of the Japanese Government. However, part of the request will be changed as mentioned in Section 3.2.5 "Study on the Equipment Requested".

3.3 Project Description

3.3.1 Executing Agency and Operational Structure

(1) Executing Agency

The executing agency of the project is the Janak Education Materials Centre.

(2) Operational Structure

Equipment to be provided through this project will be operated in the Publication Division. The Services and Maintenance Division is responsible for the maintenance of equipment.

The Publication Division has 180 staff members; 6 in administrative and clerical work, and 174 in technical and operation work. It is operating on fourteen hours; in two shifts of seven hours (at present it is operating on 24 hours working overtime in order to make up the production required). The Services and Maintenance Division has 12 staff members; 1 in administration and 11 technicians in machinery, electricity and electronics.

3.3.2 Plan of Activity

Equipment to be provided through this project makes it possible to produce textbooks (for students in the lower Grades) of 240 x 180 mm in size which are difficult to be produced with the existing equipment. Newly installed machines are to be used for mass production of textbooks for the lower Grades and the existing machines are to be used to produce textbooks for the higher Grades. There are many kinds of textbooks for the higher Grades, but the production amount of one kind is small. By the proper use of the new machines and the existing machines the production efficiency will be increased.

The existing equipment for prepress is quite obsolete. At present film is developed in tray (manual processing). Therefore, the whole prepress facilities will be replaced. The quality of press plate will be upgraded and the operation and working environment will be improved.

3.3.3 Location and Condition of the Project Site

(1) Location and Surroundings

The Janak Education Materials Centre is located midway between Katmandu and Bhaktapur and about 8 km to the eastward from the center of Katmandu. The site is on a gradual slope. An administrative block, an old factory block, a new factory block and warehouses are scattered in the site (Fig. 3.5).

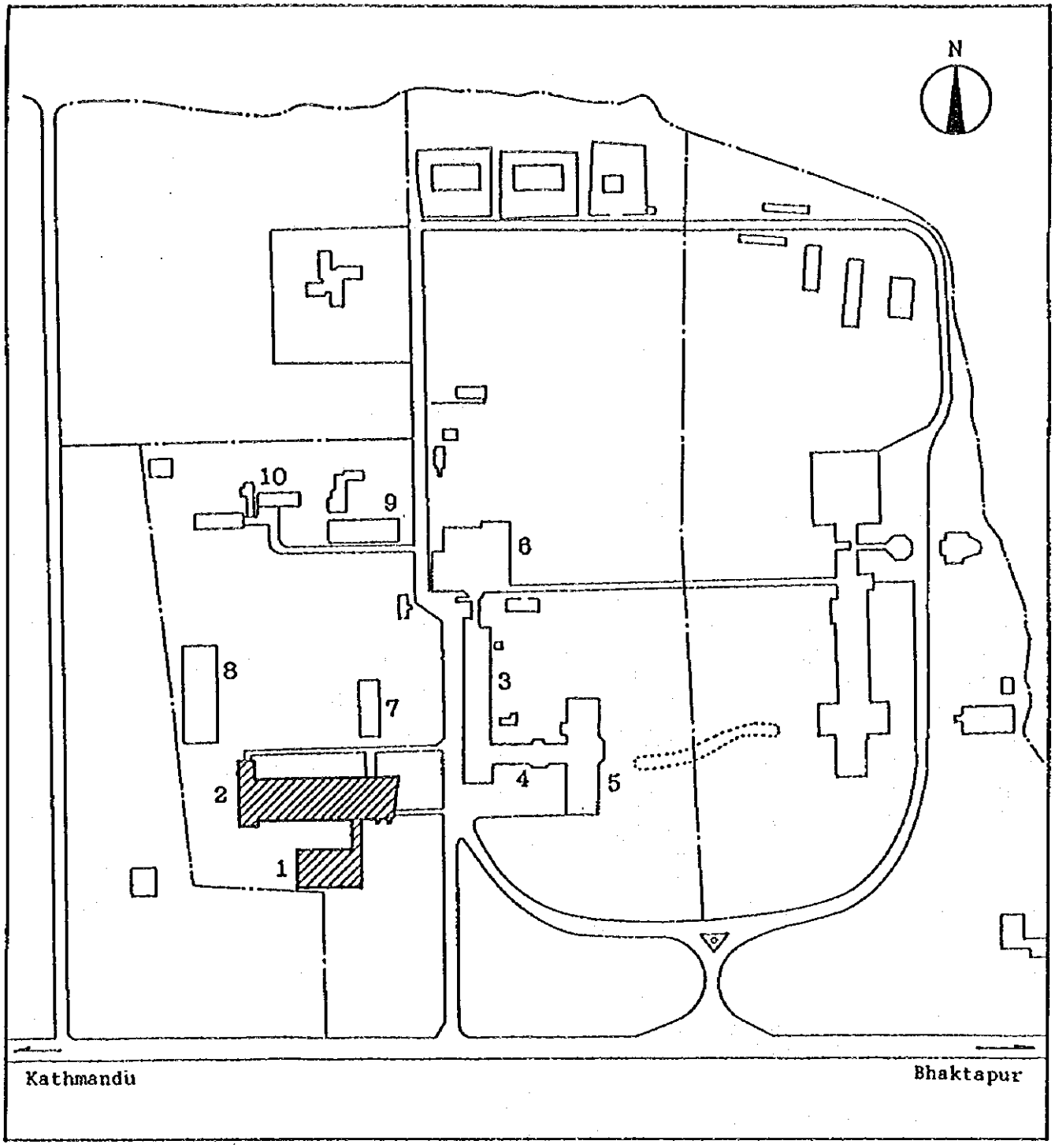
(2) Building

Equipment to be provided through this project will be installed in the new factory block and the extension block which is to be built on the south of the new factory block. The extension block is under construction.

The new factory block and the extension block are rigid frame ferro-concrete one story buildings. Prepress and printing facilities are installed in the new factory block and book binding facilities are installed in the extension block. The new factory block is already used for printing and book binding. A new arrangement plan will be drawn up taking into consideration the present arrangement of rooms and facilities, the path of line and infrastructures. The extension block is under construction. There is no problem with space to accommodate the book binding facilities of this project.

The design and the construction contract of the extension block completed and the construction started. The construction is expected to be completed by the end of October 1993.

Fig. 3.3 Janak Education Materials Centre



1: Extended block
2: New factory block
3: Existing factory block
4: Administration block No. 1
5: Administration block No. 2
6: Warehouse for parts and textbooks
7: Warehouse
8: Warehouse for Paper (No. 1)
9: Warehouse for Paper (No. 2)
10: Maintenance shop

1) Floor area

This project is to occupy floor area of about 1,029 m², which consists of about 497 m² of the floor area of 1,639 m² of the new factory block and about 532 m² of the extension block (excluding connecting corridors).

2) Height of Ceiling

New factory block	6.3 m
Extension block	6.3 m (central part)
	4.8 m (wings)

3) Allowable Load

The new factory block was built 15 years ago and the plans were not found. Its design load is unclear. However, the building was designed on the assumption that heavy equipment would be installed in it and the entire floor was treated with concrete 30 cm deep. At present five heavy printing presses (each weighs about 18 tons) are working on this floor, but there have been no subsidence of the floor or cracks in the floor. The floor of the new factory block is assumed to be able to support heavy equipment (printing press).

The floor of the extension block is structured independent of the building itself. If the slab floor is found not strong enough to support the load of equipment, it is necessary to reinforce it.

4) Entrance

The new factory block has an opening of 3m wide and the connecting corridor to the extension block has also an opening of 3 m wide. An opening will be set up in the extension block to bring in heavy equipment.

5) Ventilation

Printing presses generate heat from their motors. The room temperature reaches 30 °C in summer. Dust particles in suspension in the air deteriorate the quality of printed sheet. In these circumstances, it is advisable to block the printing facilities from other facilities, especially book binding facilities, and to ventilate the printing facilities quarter to keep the temperature low and to exhaust dust particles.

(3) Infrastructures

1) Port

Equipment is transported to Katmandu via India. It is unloaded at the port of Calcutta and transported to Katmandu by land.

2) Road

The road from Calcutta to Katmandu is entirely paved and has more than one lane on one side. The road from Katmandu to the Janak Education Materials Centre is paved on only one lane from the midway. However, this causes no problem with the transport of equipment.

3) Electricity

Electricity is supplied at 11 kV mainly by the public authority. A transformer in the site reduces the voltage. Then it is distributed to the buildings. At present the total capacity is 350 kVA. However, a transformer of 500 kVA has been repaired and now 850 kVA can be supplied.

Since electric power failures often happen, a stand-by generator, the output of which is 375 kVA, is installed. The following is a record of power failures in the past four years.

Year	Total Hours of Stoppage (hours)	Energy generated by Stand-by Generator (kWH)
1988	22	1,870
1989	105	7,350
1990	501	21,100
1991	173	11,840

Note: The duration of stoppage at one time is about 3-4 hours.

The power consumption of the existing facilities is 125 kW. In winter the heating facilities consume about 200 kW. The power consumption of the equipment of this project is about 250 kW. Therefore the electricity from the public authority is enough to power both the existing and new facilities. However, priority order of the facilities to receive power from the stand-by generator at the time of power failure must be decided since its output is only 375 kVA.

Electricity is transmitted at:

Three-phase AV	440 V ± 10 %
Single-phase AV	220 V ± 10 %
Frequency	50 Hz ± 10 %

The actual fluctuations of voltage are more than 10 %. It is necessary to install voltage regulators to keep the fluctuations within 10 %.

The shape of plug: Single-phase, two-pole earth, three round pins.

4) Water Supply

The public water supply is restricted to only about thirty minutes a day. There are three water ponds which supply 44 kl a day. In the dry season from May to July the water level goes down and sometimes the supply fails. In that case water is purchased from outside. This project does not increase the water consumption (there may be rather reduction because of automation of film development). Therefore the situation will not become worse than now.

(4) Natural Conditions (Katmandu area)

1) Temperature (°C)

Month	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Year Average
Mean Temp	9.7	12.8	16.6	20.4	23.1	24.0	23.9	24.0	23.2	19.9	15.0	11.2	18.6

2) Rainfall (mm)

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Total
Rain-fall	14.4	10.3	36.2	34.1	100.9	205.9	389.2	344.0	182.8	38.0	4.1	1.0	1361.0

3.3.4 Outline of Equipment

Outlines of equipment selected in this project are as follows.

(1) Prepress Process

Vertical Compact Camera

This is a camera to prepare the negative film for printing from a block copy (to prepare the film for prepress taking a photograph of a block copy). Enlargement and reduction of size is possible within some range.

Film Processor

This develops the film photographed with a vertical compact camera. Development, fixing, washing and drying automatically proceed.

Vacuum Printer

This is equipment which makes contact exposure of a PS plate and the negative film plate which is produced in the photo mechanical process, and to prepare a press plate.

Plate Processor

This is equipment which develops a PS plate which was contact exposed with the vacuum frame. Development, washing, drying and gumming up (treatment to protect the surface of press plate) proceed automatically.

Plate Punch

This is equipment which punches a pinhole into a press plate. The pins buried in the plate cylinder of printing press are fit into the pinholes of press plate for securing the speed and accuracy of the operation of setting a press plate to a printing press. A desk type is selected.

Effluent Treatment Facility

This is a facility which recovers electrically unused silver in the fixing solution in the photo mechanical process.

(2) Printing Process

Single Colour Sheet Fed Perfecting Press

This is a machine which prints letters, photographs, illustrations etc. on both sides of sheet at one time in a single colour. It is used for printing the text part of textbooks. It must be able to print on a sheet of B1 size (765 x 1,085 mm). The printing capacity of the machine is about 20.67 million sheets (of B1 size) a year.

Single Colour Sheet Fed Press

This is a machine which prints letters, photographs, illustrations etc. on one side of sheet in a single colour. It can print in multicolours by making printing several times changing the colour of ink at each printing. It can also print on both sides of sheet by making printing on one side first then turning round the sheet and printing on the other side. This machine is mainly used to print covers and coloured frontispieces of textbooks. But it is also used to print text parts. It must be able to print on a sheet of B2 size (543 x 765 mm). The printing capacity of the machine is 7,800 (B2, one side) sheets per day. This is equivalent to about 5.17 million of B1 size sheets per year.

(3) Book Binding Process

Folding Machine

This is equipment which prepares signatures by folding printed sheets arriving from the sheet fed press so that the printed sheet can be set on the gathering machine. It must be able to fold a printed sheet of B1 size in fourfold (delivering 32-page signatures). The folding capacity is about 10.62 million sheets of B1 size per year.

Perfect Book Binding Line (gathering, perfect binding, three-knifed trimming)

This is equipment which gathers (arranges the signatures in consecutive order) and stitches the signatures, does book back gluing and then trims all three sides, thus producing a textbook. This equipment consists of machines for gathering, wire stitching, perfect binding and three-knifed trimming which are all connected by a conveyor. After cover gluing, a stack counter stacks a certain number of books in a pile. Then a three knife cutting machine trims all three sides of a pile of books after glue is dried. The binding capacity is about 11.80 million of books (on the average 144 pages per book) a year.

Paper Trimmer

This is equipment which cuts paper into sheets of the same size before printing. It is also used to cut printed sheets of paper before folding them and to cut printed covers. It must be able to cut a sheet of B1 size.

Knife Grinder

This is equipment which grinds the knives of paper trimmer (including a three-knifed trimmer) at regular intervals to maintain the sharpness of knife. It must be able to grind the widest knife of trimmer.

Jogging Machine

This is equipment which arranges sheets of paper neatly in position with a vibration system. This is done before sheets of paper are fed to a printing press or a folding machine. The machine must be one which can handle a sheet of B1 size.

Fork Lift Truck

This is necessary to carry printing paper, to carry finished textbooks to warehouses or to trucks and to load them on trucks. Since the battery driven type needs a charger and takes time for charging, the gasoline engine driven type is selected.

Tying Machine

This is equipment which ties together a pile of textbooks which have been trimmed in the perfect book binding line to prevent a pile of textbooks from collapsing.

Hand Lift

This is a handy and convenient hand operated transportation machine which transports, loads and unloads paper and paper products in a factory.

Voltage Regulator

This is equipment which maintains the voltage stable within a limited range of fluctuations. This is for protecting machines against damage caused by the voltage fluctuations. The voltage fluctuations are big in Nepal due to insufficient supply of electricity. One each will be installed in each process of prepress, printing and book binding. The voltage regulator is necessary to maintain the performance capacity of facilities. It is installed between the electric source and each facility and supplies electricity to the facilities at a stable voltage.

3.3.5 Operation and Maintenance Plan

(1) Operation Costs and Sources of Funds

What are needed to produce textbooks with equipment provided through this project are as follows.

A. Supply of materials such as printing paper necessary to produce textbooks.

Printing paper

It is procured in domestic markets or abroad by tender. Domestic paper is made from rice straw or wheat straw and fragile, not suitable for textbooks. The use of domestic paper reduces the production efficiency. However, there is enough supply. The amount of printing paper used per year is estimated at 45 million sheets and the cost at 56.7 million rupees.

Printing ink and auxiliary materials, Dampening water, Blanket, Wire for wire stitching

At present those made in India are being used. The necessary quality and quantity will be secured by continuing to use the Indian products.

Film for prepress, PS plate, Chemicals

There will be no problem in continuing to use the foreign products which are now being used.

Glue for book binding

At present resin is imported from Sri Lanka. The quality of resin of Sri Lanka is little bit inferior to that of Japanese resin, but the price is not so high. There is no problem with the supply because the quantity needed is little.

The cost for printing ink and other materials is estimated at about 4 million rupees per year.

B. Staff in the production and maintenance

There is no need to increase the number of staff for this project. Therefore, there is no increase of personnel expenses due to the expansion of facilities. As operation of existing facility continue hereafter, the Centre is not required to reduce the number of employee by implementing this project. Present employment would stay as it is.

C. Electricity and water needed to operate equipment (utility)

The maximum supply capacity of public electricity (11 kV) is 875 kVA. The stand-by generator can supply 375 kVA and can operate the facilities at a certain level in case of power failures which frequently happen. The voltage fluctuations can be limited to a certain range by furnishing voltage regulators.

Water of 44 kl per day is supplied from three water ponds in the site. The installation of equipment through this project will not increase water consumption.

The electricity fee per year is estimated at 1.2 million rupees.

D. Supply of consumables necessary to maintain equipment

Whether consumables are properly supplied or not affects the working of equipment, the yield of products and the productivity. This project will provide a certain amount of consumables for spare stocks. However, it is necessary to plan the replenishment after the provided consumables have been used up. Such consumables as rubber products (rubber rollers etc.) have rather a short life. These must be purchased whenever they have deteriorated. The cost for replenishment of consumables is estimated at about 2 million rupees per year.

The total cost for the maintenance of the equipment to be provided through this project is estimated at about 64 million rupees per year.

The Janak Education Materials Centre is an autonomous body. The main source of income is sales of textbooks. The Government purchases textbooks which are distributed free of charge. The charged textbooks are sold on the market. The price of textbooks is decided based on the production costs by a committee comprising the Ministry of Education and Culture, the Ministry of Finance and other Government agencies. The price was 5 paisa per page in 1987, 7 paisa per page in 1989 and revised to 10 paisa per page in 1992. The Government will continue to secure the budget for free distribution of textbooks. Since the price of textbooks is decided taking consideration of the production cost, there will be no serious problem with securing the operation budget of the Centre.

(2) Management Capability of the Centre

1) The Deputy General Manager, under the General Manager, oversees the overall operation of the Center. He is in charge of the plan of expansion of the production capacity and the implementation of this project. There are 180 staff members in the Publication Division which is in charge of printing and book binding. The Services and Maintenance Division has 11 technicians in machinery, electricity and electronics.

2) The maintenance of equipment is done by the maintenance staff. Provided the staff is trained in the maintenance properly, the equipment will be maintained in good condition.

3) The maintenance fees are included in the annual operation budget of the Centre. The annual operation budget is funded by the government purchase of textbooks for free distribution and sales of textbooks.

The output and production costs in the past five years are shown in Table 3.3.

Table 3.3 Production Cost of Textbooks

(Unit: 1,000 Rupees)

	1987	1988	1989	1990	1991
Output (1,000 volumes)	6,063	7,368	6,848	8,194	7,914
Production Cost	14,558	16,223	24,393	31,388	60,390
Printing paper	7,008	6,406	14,389	18,056	40,821
Ink and consumables	1,098	1,809	1,328	2,404	3,239
Personnel expenses	5,233	6,245	7,347	9,231	14,052
Electricity	439	775	317	442	677
Spare parts	522	558	682	799	945
Repair fees	99	200	115	107	498
Others	159	230	215	349	158
Production cost/volume (Rupee)	2.40	2.20	3.56	3.83	7.63
Administration, physical distribution	8,867	9,831	10,414	10,274	14,659
Depreciation	2,605	2,564	2,637	2,390	2,222

3.4 Technical Cooperation

Technical cooperation is not prerequisit to this project, and the Centre can operate and maintain the equipment planned by present manpower and technical level. HMG, however, wants a technical cooperation programme on recent printing technology (an official request has not been submitted).

1) Training in Japan

Training in the operation of facilities for prepress, printing and book binding.

Training in the maintenance of facilities for prepress, printing and book binding.

2) Japanese experts provision

Provision of experts in system engineering of prepress, printing and book binding.

The nature of such technical cooperation programme including how many staff, how long and when should be studied in view of the progress of this project.

CHAPTER 4 BASIC DESIGN

Chapter 4 Basic Design

4.1 Design Policy

Equipment planned in Section 3.3.4 "Outline of Equipment" has been designed based on the following policy.

(1) Increase of Production Capacity of Textbooks

Equipment must be able to increase textbook production envisaged in "Basic and Primary Education Project" and to produce new textbooks specified in the new curriculum and the textbook development programme.

(2) Capacity and Quantity of Equipment

The quantity of each kind of machine is decided in such a way that the operating capacities of printing presses, folding machines and book binding facilities may match. The production capacity of new equipment is required to be about 10 million volumes per year (of 144 pages on the average).

(3) Requirements

- To have necessary and sufficient functions. Not to have excess functions.
- To be able to produce textbooks of as good quality as possible economically.
- Voltage fluctuations and power failures must be taken into consideration.
- Automation is not for labour saving, but for increasing the output and the operating capacity and for maintaining the quality of products at a certain level.

(4) Operation and Maintenance

The operation and maintenance must be not difficult.

4.2 Study and Examination on Design Criteria

4.2.1 Natural Conditions

(1) Climate

From the past records of temperatures in Katmandu, equipment is assumed to work in temperatures of 0°C - 35°C.

(2) Altitude

Kathmandu is situated at a height of 1,100 - 1,300 m above sea level. Equipment which is affected by the atmospheric pressures must be adjusted to the use at a high altitude.

4.2.2 Buildings and Utilities

(1) Buildings

The new equipment is installed in the new factory block or the extension block. In the placement of equipment some measures must be taken in the following cases.

1) The weight of equipment exceeds the allowable load of the floor.
2) Foundation on which equipment is fixed is required.
3) Equipment vibrates.

When the printing press, paper cutter, perfect binding facilities etc. come under the cases as mentioned above, the supplier must provide as soon as possible after the selection of equipment the Janak Education Materials Centre with the documents and information on these machines which are necessary for the Centre to take appropriate measures (necessary foundation work, etc.).

The printing process and the book binding process are better to be installed in separate buildings. Since the existing book binding facilities can not be moved, we advise to set up partitions between these two facilities. Work of partitioning will be done by the Centre.

(2) Electricity

Electricity is supplied to equipment from the cabinet panel at:

Three-phase	440 V ±10 %
Single-phase	220 V ±10 %
Frequency	50 Hz

4.3 Basic Design

4.3.1 Equipment Plan

The equipment planned is listed as follows.

No.	Name of Equipment	Qty	Remarks
A. Prepress Equipment			
A1	Vertical Compact Camera	1	Max. image size: 635/610mm x 508mm Transparency and Reflection, No equipped apparatus for color separation function
A2	Film Processor	1	Max. film width: 712mm RAS type film
A3	Vacuum Printer	1	with Automatic light diffuser, Shading curtain and Automatic lamp height adjusting mechanism
A4	Plate Processor	1	with Gum coater, Plate dryer and Automatic plate discharging unit
A5	Plate Punch	1	6mmϕ Pin pitch: 400/700/900mm with Single pins
A6	Effluent Treatment Facility	1	Silver recovery apparatus from effluent of fixing solution, Capacity: 80l/day
B. Printing Presses			
B1	Single Colour Sheet Fed Perfecting Presses	2	Max. designed speed: 11,000sph with Dampening system
B2	Single Colour Sheet Fed Press	1	Max. designed speed: 11,000sph with Dampening system

C. Book Binding Equipment and Others			
C1	Folding Machines	5	32 page fold (4 directional) with Vertical stacker binding device
C2	Perfect Book Binding Line with 12 gathering stations $ 3 Knife trimmer	1line	Signature size: A6-A4 Max. speed: 6,000 books/hr (single gathering work) Nos. of station: 6 station x 2 Arm type, with Double gathering device, Wire stitching unit (3 heads), Hotmelt gluing device (spine and side gluing), Conveyors and Counter stacker
C3	Paper Trimmer (Guillotine Cutter)	1	Max. cutting width: 1,370mm with programming panel
C4	Knife Grinder	1	Max. width: 1,700mm
C5	Jogging Machine	1	Max. sheet size: 900mm x 1,120mm
C6	Paper Lift (Fork Lift Truck)	1	Power type: Gasoline engine Torque converter Load capacity: 1,500kg
C7	Tying Machine	1 set	Pedal type Max. work width: 450mm Table length: 250mm
C8	Hand Lifts	2	Load capacity: 2,500kg Lift: 65mm-165mm
C9	Automatic Voltage Regulator	1 set	Static feedback type Output voltage: 210V Output voltage accuracy: less than ±1.5% A Output Capacity: 25kv (Prepress) B Output capacity: 140kv (Printing) C Output Capacity: 100kv (Book binding)

4.3.2 Equipment Installation Plan

Equipment must be installed taking the following points into consideration.

1) Equipment for prepress and printing presses are installed in the new factory block. Equipment for book binding is installed in the extension block.

2) Equipment must be placed considering the flow of work from the arrival of printing paper to the shipment of textbooks.

3) The existing facilities on work are not moved. Placement of new equipment must be done not to disturb the operation of existing facilities as much as possible.

4) The printing presses must be placed separate from the existing book binding facilities. Partitions are necessary between these two facilities.

5) Space for putting intermediate products must be secured.

Placement plans of major equipment are shown in the following figures.

Fig. 4.1 Map of the New Factory Block and the Extension Block

Fig. 4.2 Equipment Placement Plan in the New Factory Block

Fig. 4.3 Equipment Placement Plan in the Extension Block

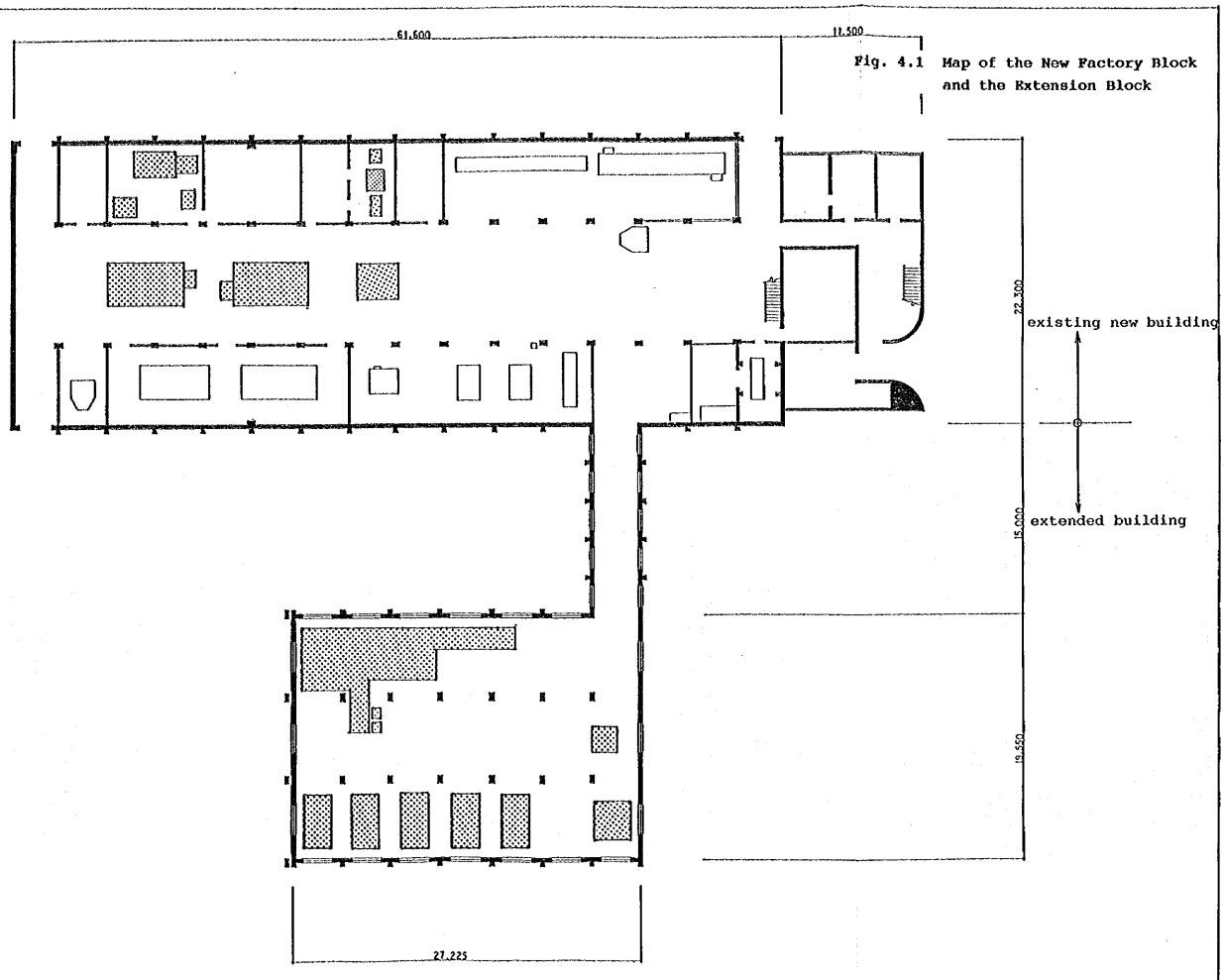
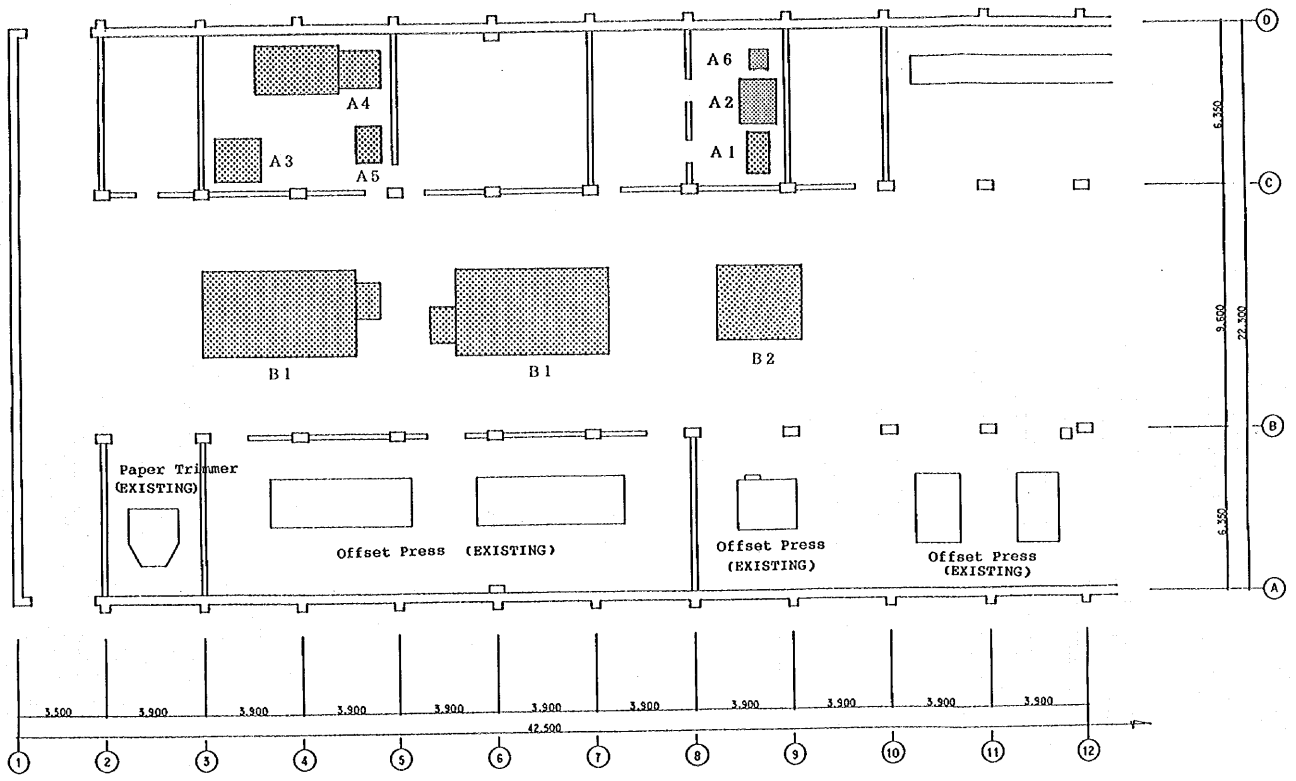


Fig. 4.1 Map of the New Factory Block and the Extension Block

A1:Vertical Compact Camera
A2:Film Processor
A3:Vacuum Printer
A4:Plate processor
A5:Plate Punch
A6:Effluent Treatment Facility

B1:Single Color Sheet Fed Perfecting Press
B2:Single Color Sheet fed Press

Fig. 4.2 Equipment Placement Plan in the New Factory Block



C1:Folding Machine
C2:Perfect Bindig Line with 12 gathering stations & Knife trimmer
C3:Paper Trimmer
* C4:Knife Grinder
C5:Jogging Machine
* C6:Paper Lift
C7:Tying Machine
* C8:Hand Pallet Truck
* C9:Automatic Voltage Regulator

*1. C4: Knife Grinder is to be placed in old factory block.
*2. C6 and C8 are movable.
*3. The place of C9 (AVR) depends on the place of distribution board (not decided yet).

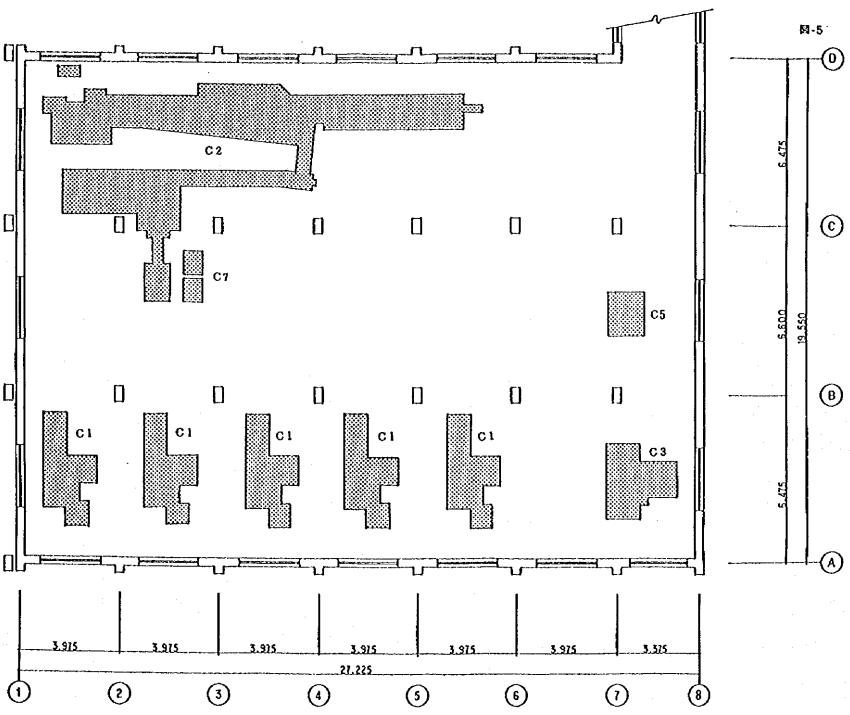


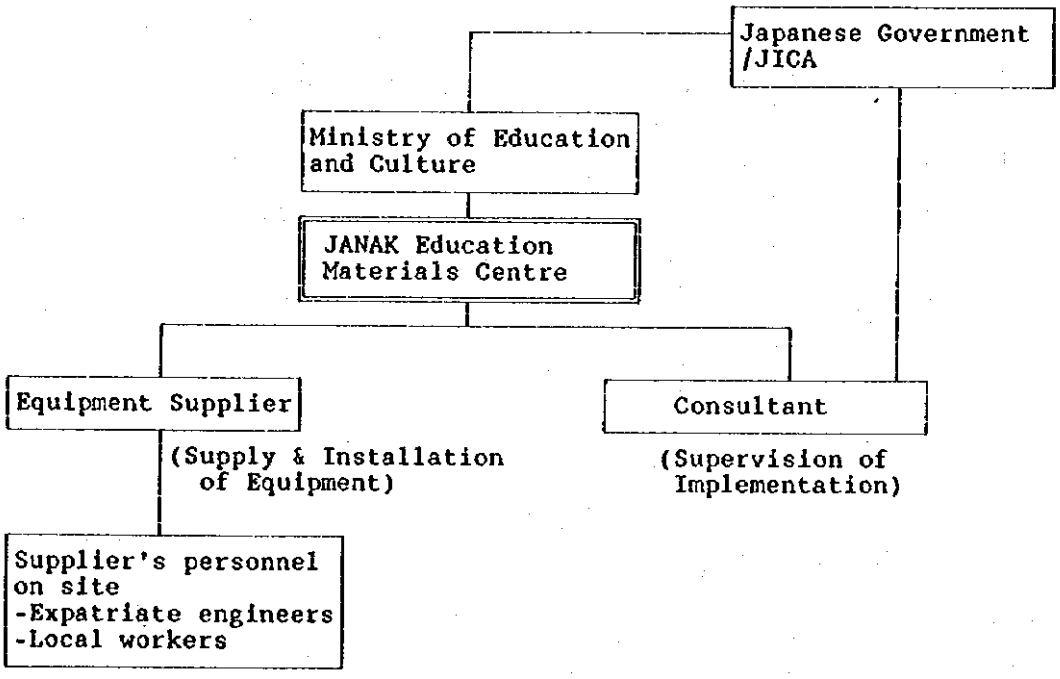
Fig. 4.3 Equipment Placement Plan in the Extension Block

4.4 Implementation Plan

4.4.1 Implementation Policy

The project consists of the building and facility works which are to be done by the Nepal side and the provision of equipment through a Grant Aid of the Japanese Government. The executing agency of this project, the Janak Education Materials Centre will enter into a contract with a Japanese consultant which executes the detail design, the preparation of a tender, the tender evaluation and the supervision of execution of equipment installation in lieu of the Centre. A chart of the project execution organization is shown in Fig. 4.4.

Fig. 4.4 Organization of Execution of the Project



4.4.2 Points to be Considered in the Execution

Manufacturing of some equipment takes time. Transportation of equipment also takes time. Procedures for the transportation and the work on the site must be taken in the period of tender preparation so that the whole work may be completed by the planned time.

The time of installation of equipment and dispatch of installation engineers must be arranged so as to avoid waiting time on the spot.

4.4.3 Plan for Supervision of the Implementation

In accordance with the regulations of the Grant Aid of the Japanese Government and the consultant contract, the consultant shall carry out the project without delay supervising the implementation in line with the basic design. During the implementation of the project the consultant may, whenever necessary, arrange for a supervisor to be present on the spot at the time of approval of the manufacturing design of equipment, of pre-shipment inspection at a factory, and of installation and inspection of equipment at delivery. The consultant shall be informed on the progress of works which are necessary to be done by the Nepal side to install the equipment. When some delays are occasioned the consultant shall advise the Nepal side of necessary steps to take if required.

4.4.4 Equipment Procurement Plan

(1) Procurement

Procurement of equipment will be done under a lump sum contract with a supplier of equipment (trading company) which is a successful bidder in the competitive bidding. In principle Japanese products will be procured.

(2) Transportation

The equipment will be shipped from a port near the place of manufacturing all at one time or separately at different times and unloaded at the port of Calcutta. It will be transported on the road from Calcutta to Kathmandu. The customs clearance is made at the border between India and Nepal. Since the equipment is a precision machine, the manufacturers and the supplier are requested to pay special attention to packing, loading and unloading of machines. It is also necessary to take proper procedures beforehand to avoid troubles and delays at the customs clearance.

4.4.5 Scope of the Work

(1) Scope of the Work of the Japanese Side

1) Procurement, transportation to the site and installation on the site, of equipment.

2) Electrical wiring work from a socket in the factory to the installed equipment (a socket must be located near the installed equipment and the wiring work from a power source to the socket shall be done by the Nepal side).

3) Test operation and adjustment of equipment. Instruction of operation and maintenance.

4) Consulting services including preparation of tender documents, management of tendering and supervision of the project implementation.

(2) Scope of the Work of the Nepal Side

1) Construction of the extension block to install equipment.

2) To arrange the routes in the site to carry equipment to the factories.

3) Foundation work necessary to install equipment (foundation plans are to be provided by the Japanese manufacturers).

4) Supply of electric power which the equipment requires: work to increase capacity when a socket or a cabinet panel capacity must be increased.

5) Plumbing work for water and drainage work for the machines which use water.

6) Partitioning and air-conditioning work of rooms in which equipment is installed.

7) To prepare shelves, desks, utensils and office equipment.

8) Supply of utilities including electricity which is required to install, test operate and test equipment.

9) Procedures to be taken and expenses to be borne by the Nepal side.

- To bear commissions to a foreign exchange bank for the banking services.

- To bear expenses for procedures on tax exemption.

- To take measures to facilitate the unloading, customs clearance and inland transportation of equipment.

- To take procedures to exempt Japanese nationals who enter and stay in Nepal to implement the project from customs, domestic taxes and other surcharges or to bear such taxes.

- To accord Japanese nationals whose service may be required in connection with the project such facilities as may be necessary for their entry into Nepal and stay therein for the performance of their work.

- To place the necessary staff in the operation and management of the project.

4.4.6 Implementation Schedule

The project through a Grant Aid of the Japanese Government shall be implemented in the following sequence.

(1) Detail Design

The consultant prepares the detail design based on the basic design and the tender documents. After having obtained the approval of the authorities concerned, the consultant will execute tendering, evaluate the tender, make a contract with the supplier and place an order for equipment. It will take about 2 months to complete these processes.

(2) Manufacturing and Works

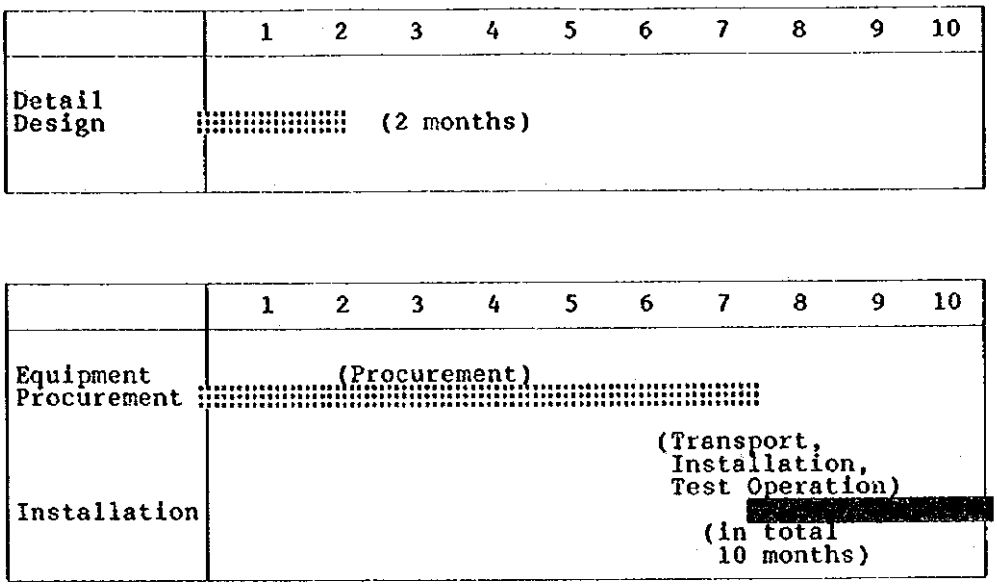
The supply contractor will arrange the documents of approval for manufacturing of equipment, manufacture equipment, and ship the equipment to Nepal. The supply contractor will execute all the works in Nepal (unloading, customs clearance, inland transportation and installation) until the test operation on the site is completed.

(3) Completion of the Work

In the presence of the Janak Education Materials Centre, the consultant and other parties concerned, the installed equipment is test operated and confirmed that it conforms to the specifications, and then delivered to the Nepal side. The Nepal side issues certificates of the completion of the work to the supply contractor and the consultant. When the works go as planned all the works will be completed in about ten months after the equipment supply contract is placed .

The implementation schedule is shown in Fig. 4.5.

Fig. 4.5 Implementation Schedule



4.4.7 Costs for the Nepal Side

The costs of the work to be done by the Nepal side will be about 6.9 million rupees. The breakdown is as follows.

	(Million Rupees)
Extension work of buildings etc. (including service and air-conditioning work)	5.3
Foundation work and others	1.6
Total	6.9

CHAPTER 5 PROJECT EVALUATION AND CONCLUSION

Chapter 5 Project Evaluation and Conclusion

5.1 Project Evaluation

The objective of the plan to increase the production capacity of textbooks at the Janak Education Materials Center is to increase its production capacity to meet the increasing demand for textbooks in primary and secondary education and to expand its facilities in order to produce textbooks of new specifications efficiently. Accordingly the purpose of this project is to expand the equipment necessary to increase the textbook production. The effects which are expected as the result of the implementation of the project are summarized in Table 5.1.

Table 5.1 Expected Effects and Improvement

Present Situation and Problems	Measures of This Project	Effect and Improvement
1)The participation rate at the primary education level and the literacy rate are low in Nepal. Primary and secondary education is not spread widely. The government gives priority to education policies and has taken measures to make basic and primary education accessible to all and to improve the quality of education, such as construction of schools, teacher training and free distribution of textbooks. These measures have resulted in the increase of the participation rate at the primary education level and the number of students. However, the textbook production capacity is limited and can not meet the increasing demand.	1)To increase the production capacity of the Janak Education Materials Centre which is the only factory producing textbooks in Nepal in order to solve the problem of insufficient supply of textbooks and, to enable the Centre to meet the future demand for textbooks.	1)The expansion of production capacity of textbooks which are used in primary and secondary education will contribute to the spread of education and improvement of educational quality and will play an important role in the progress of the Basic ad Primary Education Project. The project will help solve the problems caused by lack of education which hinder the economic development, the improvement of health conditions of people, the implementation of family planning and so on.
2)His Majesty's Government is developing in the Basic and Primary Education Project a new curriculum and textbooks which facilitate the understanding of students in order to increase the participation rate and to reduce dropouts. The number of textbooks prescribed for students in lower Grades has increased from 2 to 3 and the size has been enlarged. However, the present facilities can produce textbooks of new size only by reducing the production. To keep the present production level there is no other choice than to continue to produce textbooks of the present size which is not favourable to education.	2)The equipment to be provided by this project is the one which can produce the textbooks of new specifications keeping the present production level. The new equipment will increase the quality of textbooks in primary education.	2)The project will provide textbooks which are attractive to and easy to use by students by increasing volumes of textbooks prescribed for students and by improving the appearance. The new textbooks which the project will provide are the embodiment of the new ideas of curriculum and textbook. Provisions of more attractive textbooks and of better trained teachers will result in the increase of enrollment in primary and secondary education and reduce the dropouts.
3)The existing production facilities are mostly old and obsolete. Especially the facilities for prepress are those installed when the Center was set up and are of obsolete type. These old machines are working owing to efforts of workers, but their productivity is poor and the working environment is not favourable. The will to work is not low among the workers but the level of the printing technology and the efficiency are low.	3)The equipment selected for this project must be the one which suits the production of textbooks in Nepal and be a product of advanced technology as well which can enhance the productivity. The staff will be trained in the opeation and maintenance. The existing printing and book binding facilities will continue to be used, but the prepress facilities will be replaced entirely with new machines and be modernized.	3)The Centre is one of the leading printing factories in Nepal. The project will enable the Center to modernize its textbook production. Training of the staff in the operation and maintenance of new equipment will raise the level of prepress, printing and book binding skills of the technicians and workers of the Centre.

5.2 Conclusion

To increase the production capacity of textbooks is necessary for the spread of basic and primary education and the improvement of educational quality which are priority policies of Nepal. As mentioned before, the project is expected help significantly the spread of primary and secondary education and the improvement of educational quality. It will contribute to the improvement of the basic necessities of people's life directly as well as indirectly and also to raising the printing technique level of Nepal. There will be no problem with the organization, manpower and funds on the Nepal side. These benefits and the operational structure will justify to implement this project through a Grant Aid of the Japanese Government. However, the following measures are necessary to be taken by the Nepal side in order to implement the project as planned.

(1) Execution of the Works on the Nepal Side

The buildings in which equipment is installed, especially the extension block (Floor's allowable bearing capacity is considered) must be completed as planned. Procedures necessary for the unloading, custom clearance, inland transportation and installation of equipment must be taken promptly so that the contractor can secure safety and prevent the equipment from being damaged until the whole process is completed.

(2) Budget for Maintenance Fees

It is indispensable to secure a certain amount of funds to pay for maintenance fees in order to maintain equipment in good working condition. It is necessary for the Janak Education Materials Centre and HMG to take measures to ensure the budget for the maintenance of equipment and to produce the planned volumes of textbooks.

(3) Training of the Staff

The training of the staff in charge of operation and maintenance is necessary to operate equipment in its full capacity. A responsible person for the operation and maintenance should be appointed. The staff members must be trained as soon as possible when the equipment is installed. In the training it must be noted that printing equipment requires delicate skills to handle.

(4) Replenishment of Spare Parts

It is necessary to keep a certain amount of spare parts and consumables which are necessary for the operation of equipment. The storage, inventory control and replenishment must be done properly. It is also necessary to establish a way to replenish parts. Someone must be responsible for keeping instruction manuals in order.

(5) Introduction of Factory Management

The present factory management of the Janak Education Materials Centre is not adequate. The increase of productivity by using equipment efficiently will lower the cost and produce textbooks of better quality. When the factory is arranged neatly, the handling of printing paper and products is improved and management techniques such as preventive measures against machine troubles and the quality control are introduced, the attitude and behaviour of workers will change and the productivity will go up noticeably.

APPENDICES

APPENDIX-1 MEMBERS OF THE BASIC DESIGN STUDY TEAM

Yasushi Hiroshige	Team Leader, Deputy Director, Textbook Division, Elementary and Secondary Education Bureau, Ministry of Education, Science and Culture
Futoshi Takahashi	Cooperation Policy Planner Grant Aid Division, Economic Cooperation Bureau, Ministry of Foreign Affairs
Toshiaki Tanaka	Project Coordinator First Budget Division, Finance and Accounting Department, JICA
Kiko Nagasawa	Educational Materials Development Planner (Leader of Consultant) UNICO INTERNATIONAL CORPORATION
Shigenori Watanabe	Printing and Plate-making Machine Planner UNICO INTERNATIONAL CORPORATION
Fusaichi Sekine	Binding Machine Planner UNICO INTERNATIONAL CORPORATION
Jun Ikeda	Arrangement Planner/Cost Estimator UNICO INTERNATIONAL CORPORATION

APPENDIX-2 SCHEDULE OF THE FIELD SURVEY
(Oct. 27, 1992 - Nov. 13, 1992)

1.	Oct. 27 (Tues.)	(Messrs. Hiroshige, Takahashi, Tanaka, Nagasawa, Sekine, Ikeda) Lv. Tokyo -- Ar. Bangkok
2.	Oct. 28 (Wed.)	Lv. Bangkok -- Ar. Kathmandu - Meeting at JICA Nepal Office - Courtesy call on the Embassy of Japan
3.	Oct. 29 (Thur.)	(Kathmandu) - Courtesy meeting at Ministry of Education and Culture - Meeting with the staff of JEMC - Courtesy call on Ministry of Finance - Meeting with the officers of UNICEF and the World Bank
4.	Oct. 30 (Fri.)	(Kathmandu) - Meeting with the staff of JEMC
5.	Oct. 31 (Sat.)	(1) (Kathmandu) - Team Meeting and Data Arrangement (2) (Mr. Egashira) Lv. Tokyo -- Ar. Bangkok
6.	Nov. 1 (Sun.)	(1) (Kathmandu) - Signing of the Minutes of Discussions - Survey of Primary Schools (2) (Mr. Egashira) Lv. Bangkok -- Ar. Kathmandu
7.	Nov. 2 (Mon.)	(1) (Kathmandu) - Meeting with the staff of JEMC (2) (Messrs. Hiroshige & Takahashi) Lv. Kathmandu -- Ar. Bangkok
8.	Nov. 3 (Tues.)	(1) (Kathmandu) - Meeting with the staff of JEMC - Meeting with the staff of CTSDC at CTSDC (2) (Messrs. Hiroshige & Takahashi) Lv. Bangkok -- Ar. Tokyo
9.	Nov. 4 (Wed.)	(1) (Kathmandu) - Meeting with the staff of JEMC (2) (Mr. Tanaka) Lv. Kathmandu -- Ar. Bangkok

10.	Nov. 5 (Thur.)	(1) (Kathmandu) - Meeting with the staff of JEMC (2) (Mr. Tanaka) Lv. Bangkok -- Ar. Tokyo
11.	Nov. 6 (Fri.)	(Kathmandu) - Meeting with the staff of JEMC
12.	Nov. 7 (Sat.)	(Kathmandu) - Team Meeting and Data Arrangement
13.	Nov. 8 (Sun.)	(Kathmandu) - Meeting with the members of Paper Manufacturing Companies at JEMC
14.	Nov. 9 (Mon.)	(Kathmandu) - Courtesy call for Secretary of Ministry of Education and Culture - Meeting with the Director of BPEP - Meeting with the staff of JEMC
15.	Nov. 10 (Tues.)	(Kathmandu) - Meeting with the staff of JEMC - Reporting the results of local survey to the Embassy of Japan
16.	Nov. 11 (Wed.)	(Kathmandu) - Reporting the results of local survey to JICA Nepal Office (Messrs. Nagasawa, Egashira, Sekine, Ikeda) Lv. Kathmandu -- Ar. Bangkok
17.	Nov. 12 (Thur.)	(Bangkok) - Visiting a textbook printing factory
18.	Nov. 13 (Fri.)	Lv. Bangkok -- Ar. Tokyo

APPENDIX-3 LIST OF PERSONS INTERVIEWED

(Name)	(Position)
Ministry of Education and Culture	
Dr. Ishor Prasad Upadhaya	Secretary
Dr. Kedar No. Shrestha	Additional Secretary
B. P. Lohani	
Ministry of Finance	
Ram Binod Bhattarai	Joint Secretary
Janak Education Materials Centre: JEMC	
Sarad C. Poudyal	Chairman Cum General Manager
Lokesh R. Dali	Deputy General Manageer
Phupendra B. Basnyat	Director, Production Division
The World Bank (Nepal Office)	
Bigyan Pradhan	Program Officer
Brajesh Panth	Social Sector Specialist
UNICEF (Nepal Office)	
Habib Hammam	Representative
Afreen Huq	Project Officer Education
Rachvendra Upadnyay	
Masahiro Ono	Assistant Information Officer
Curriculum Textbook & Supervision Development Centre: CTSDC	
Bishwa Nath Aryal	Chief
Shrestha Laxmi Nath	
Sharya Ratna Man	
Basic and Primary Education Project: BPEP	
Tirtha Raj Khaniya	Director
Diwakar Dhungel	
Paper Mills	
Bhusan K. Shrestha	Everest Paper Mills (PVT.) Ltd.
Rajendra Kabra	Saurabh Enerprises
Colour Printing Corporations and Construction Desinger	
Buddha Ratna Manandhar	Prism Color Scanning & Press Support Rt.
Acharya Pradeer Kumar	Construction Designer

Japanese Embassy in Nepal

Chuichi Ito	Ambassador
Masao Ishikawa	Minister
Masaei Matsunaga	Second Secretary

JICA, Nepal

Yasuyuki Kobori	Representative
Hiroshi Murakami	Deputy Representative
Norio Naito	

APPENDIX-4 MINUTES OF DISCUSSIONS

MINUTES OF DISCUSSIONS
BASIC DESIGN STUDY ON THE PROJECT FOR EXPANSION OF THE EDUCATIONAL MATERIALS CENTRE IN THE KINGDOM OF NEPAL

In response to a request from His Majesty's Government of Nepal, the Government of Japan decided to conduct a Basic Design Study on the project for expansion of the educational materials centre in the Kingdom of Nepal (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Nepal a study team, which is headed by Mr. Yasushi Hiroshige, Deputy Director, Textbook Division, Elementary and Secondary Education Bureau, Ministry of Education, Science and Culture, and is scheduled to stay in the country from October 28 to November 11, 1992.

The team held discussions with the officials concerned of His Majesty's Government of Nepal and conducted a field survey.

In the course of discussions and field survey, both parties have confirmed the main items described on the attached sheets. The Team will proceed to further works and prepare the Basic Design Study Report.

Kathmandu, November 1, 1992

廣重靖	Kedar N. Shrestha
Mr. Yasushi Hiroshige	Dr. Kedar N. Shrestha
Leader	Acting Secretary
Basic Design Study Team	Ministry of Education and
JICA	Culture, HMG Nepal

ATTACHMENT

1. Objective

The objective of the Project is to strengthen the printing and its allied equipment for the production of textbooks at Janak Education Materials Centre.

2. Project site

The project site is located at Sanothimi Bhaktapur which appears in Annex I.

3. Responsible organization, executing organization

(1) Responsible organization : Ministry of Education and Culture

(2) Executing organization : Janak Education Materials Centre

4. Items requested by His Majesty's Government of Nepal

After discussions with the Basic Design Study team, the items are finally requested by the Nepal side in Annex II.

5. Japan's Grant Aid system

(1) His Majesty's Government of Nepal has understood the system of Japanese Grant Aid explained by the team.

(2) His Majesty's Government of Nepal will take the necessary measures, described in Annex III for smooth implementation of the Project, on condition that the Grant Aid assistance by the Government of Japan is extended to the Project.

6. Schedule of the Project

(1) The consultants will proceed to further studies in Nepal until November 11, 1992.

(2) Based on the Minutes of Discussions and technical examination of the study results, JICA will complete the final report and send it to His Majesty's Government of Nepal by April, 1993.

7. Construction of New Building

Ministry of Education and Culture will inform the embassy of Japan the progress and the schedule of construction of new building at JEMC every month.

8. Budget

His Majesty's Government of Nepal will continue to allocate enough budget to promote free distribution of textbooks for primary students in order to increase the enrollment of primary school, and also to support indirectly the budget of JEMC.

9. Technical Cooperation

Ministry of Education and Culture requested the Basic Design Study team for the technical cooperation by the Government of Japan as follows:

(1) Acceptance of trainees

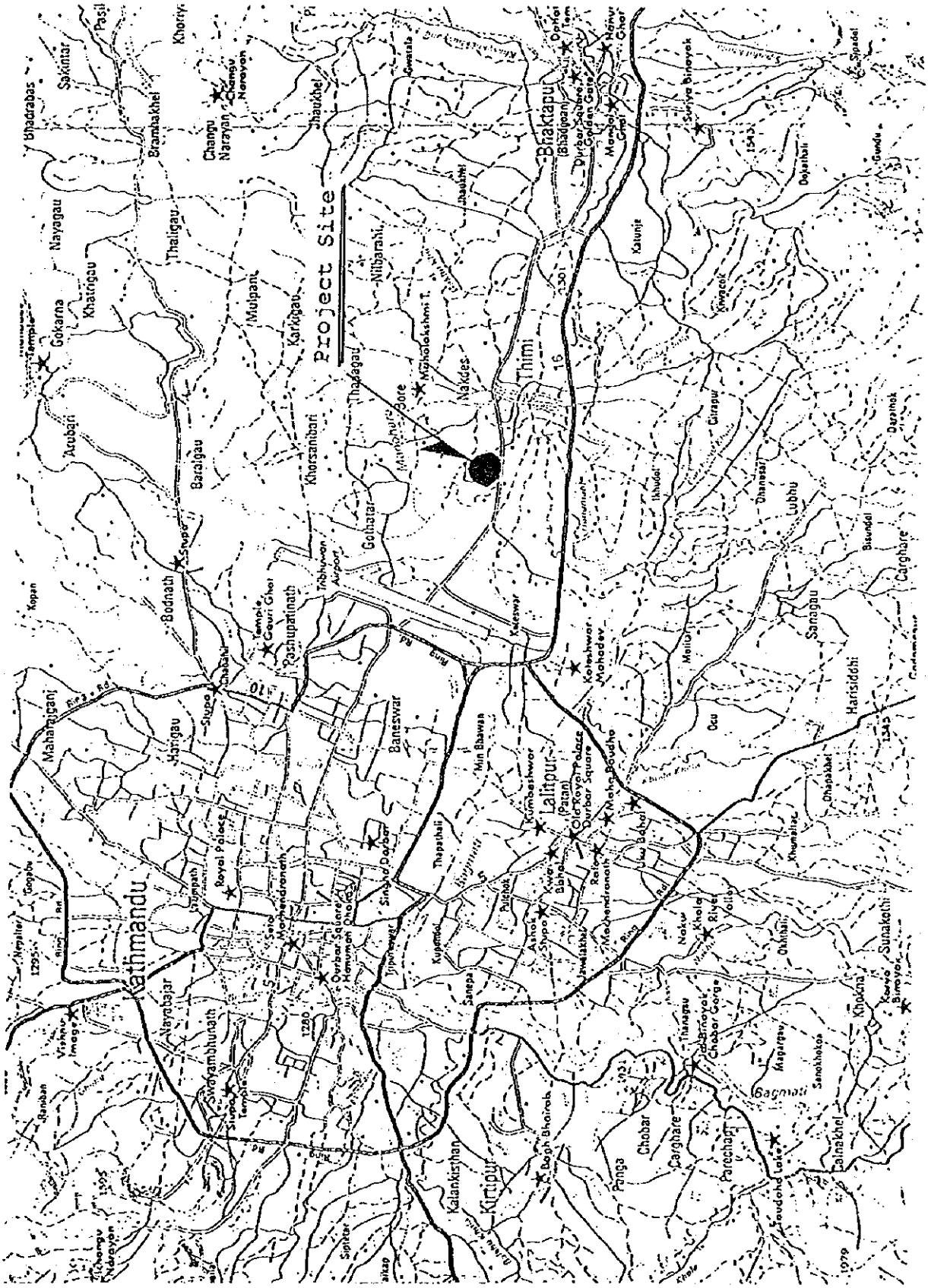
a) operation of plate-making, printing and binding machines.

b) maintenance of plate-making, printing and binding machines.

(2) Dispatch of experts for plate-making, printing and binding system.

Annex I

Project Site



Annex II

Items requested by His Majesty's Government of Nepal.

1. Single Color Sheet Fed Perfecting Press

2. Single Color Sheet Fed Press

3. Folding Machine

4. 12-Station Gathering and Stitching Machine

5. Perfect Binding Machine

6. Paper Trimmer

7. Three-Knifed Trimmer

8. Vertical Compact Camera

9. Vacuum Printer

10. Plate Processor

11. Effluent Treatment Facility

12. Paper lift

Annex III

Necessary measures to be taken by His Majesty's Government of Nepal in case Japan's Grant Aid is executed.

1. To arrange the appropriate building with facilities of electricity, water supply, drainage, etc., before the commencement of installation work.

2. To ensure prompt unloading, exempt taxes, and take necessary measures for customs clearance at port of disembarkation and inland transportation in Nepal of the equipment provided under the Grant Aid, and bear all expenses for going through formalities.

3. To bear commissions to the Japanese foreign exchange bank for the banking services based upon the Banking Arrangement.

4. To accord Japanese nationals whose services may be required in connection with the supply of products and services under the verified contract such facilities as may be necessary for their entry into Nepal and stay therein for the performance of their work.

5. To maintain and use properly the equipment purchased under the Grant Aid.

6. To bear all the expenses other than those to be borne by the Grant Aid, necessary for the execution of the Project.

7. To take measures of permission and sanction necessary for execution of the Project.

K.S 濱中

JICA