



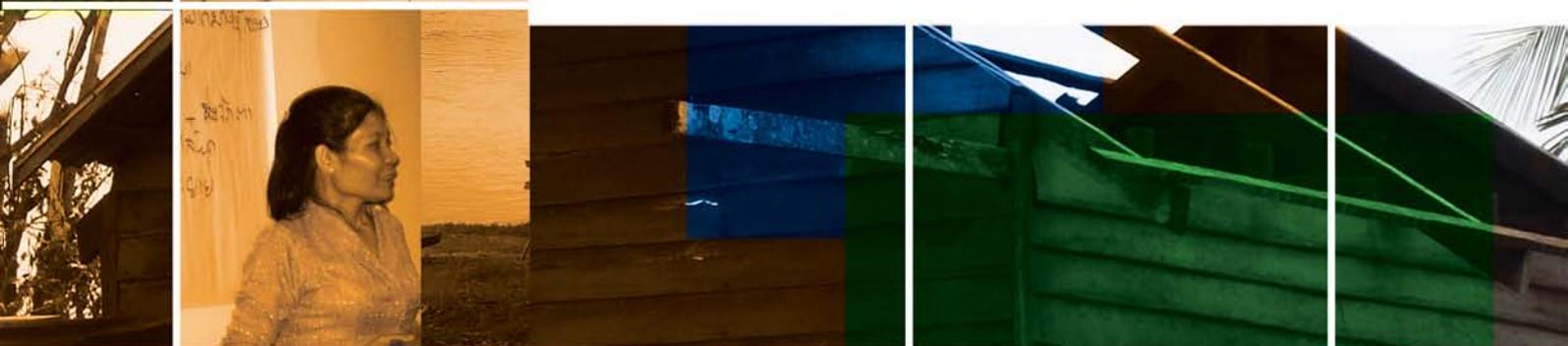
Impacts of Disasters on the Education Sector in Lao PDR



Developed under the Advocacy and Pilot Implementation Project on the Education Sector in South East Asia

Support to Implementation of Hyogo Framework for Action through Mainstreaming of Disaster Risk Reduction into Development - A Program of the Regional Consultative Committee on Disaster Management (RCC)

The logos are arranged horizontally. From left to right: the National Disaster Management Office logo (a circular emblem with a map of Laos), the Ministry of Education logo (a green emblem with a book and a lamp), the European Commission logo (a blue rectangle with yellow stars and the text 'EUROPEAN COMMISSION' and 'Humanitarian Aid'), the UNDP logo (a blue square with the UN emblem and the letters 'UNDP'), and the adpc logo (a red rectangle with the letters 'adpc' in white).



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In the course of this study, MPCTC was under the direction of the ADPC Disaster Management Systems (DMS) Team; under the leadership of its Director and Team Leader, Mr. Loy Rego with substantive support from ADPC DMS staff namely:

Mr. Sanjaya Bhatia, Program Manager
Ms. Ma Ma Gyi, Project Coordinator
Mr. Anisur Rahman, Project Coordinator
Mr. Md. Zakir Hossain, Research Associate

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Asian Disaster Preparedness Center (ADPC)
P O Box 4, Klong Luang, Pathumthani, Thailand 12120
Tel: (66 2) 516 5900-10
Fax: (66 2) 524 5360
Email: adpc@adpc.net
Website: www.adpc.net

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Foreword

Lao PDR is vulnerable to all kinds of disasters, e.g., fires, floods, droughts, land slides and erosion, typhoons, pests' epidemics, earthquake etc. In the past due to impact from disasters the country had observed great losses both in physical and social economic structures. Lao PDR is yet to be strong enough to prevent and mitigate any sort of disaster. Therefore, in order to combat forthcoming disasters government along with international bodies will have to work together on both structural and non-structural measures.

Realizing the importance of integrating disaster risk reduction (DRR) into development sectors, the Regional Consultative Committee on Disaster Management (RCC) program on Advocacy and Capacity Building for Mainstreaming Disaster Risk Reduction into Development (MDRD) was launched at the 4th Meeting in Bangladesh in March 2004. The program focuses on two separate approaches relating to mainstreaming DRR, namely, i) into over-all national development planning and ii.) into specific priority sectors such as Agriculture, Health, Education, Infrastructure, Housing, and Financial Services.

Cambodia, Lao PDR and Philippines have expressed their interest to initiate priority implementation projects to mainstream disaster risk reduction in education sector by integrating DRR modules into educational curriculum. The MDRD Education project includes four main activities, namely; i) Initiating Mainstreaming of Disaster Risk Reduction into Secondary School Curriculum, ii) Study on Impacts of Disasters on Education Sector, iii) Advocacy Workshop on Mainstreaming Disaster Risk Reduction into Education Sector, and iv) Stakeholder consultation as follow up to the Advocacy Workshop.

This study on impacts of disasters on education sector in Lao PDR aims to build an evidence-based rationale to raise awareness on integrating DRR concerns into education policies and to advocate for changing practices in school construction especially in incorporating disaster risk resilient features in new school construction.

Acknowledgements

This study would not have been possible without the assistance and support from the various organizations in Lao PDR that contributed their invaluable inputs and time to provide information related to the study area, namely:

- Department of General Education, MOE
- National Educational Science Research Institute, MOE
- Department of Planning and Foreign Relation, MOE
- Department of Informal Teaching , MOE
- Department of Fire Prevention and Protection, Ministry of Public Security
- ADB
- JICA, Vientiane, Lao PDR
- UNICEF
- World Bank
- Save the Children, Australia
- KOICA
- Phiawat Secondary School
- Principals of Provincial Schools

Lastly, we would like to express our deep appreciation to local organizations, school principals and authorities for providing helpful information to successfully accomplish this study. We do hope that this document would be a vital evidence-based publication on advocating for safer schools through integrating DRR concerns into education policies, curriculum, and school construction.

Abbreviations and Acronyms

ADB	Asian Development Bank
ADPC	Asian Disaster Preparedness Center
CPI	Committee for Planning and Investment
EFA	Education For All
DMH	Department of Meteorology and Hydrology
FPPD	Fire Protection and Prevention Department
FDPCC	Flood-Drought Prevention Coordination Committee
JICA	Japan International Cooperation Agency
KOICA	Korea International Cooperation Agency
MOE	Ministry of Education
MAF	Ministry of Agriculture and Forestry
MDRD	Mainstreaming Disaster Risk Reduction into Development
MPWT	Ministry of Public Works and Transportation
MPS	Ministry of Public Security
NDMC	National Disaster Management Committee
NDMO	National Disaster Management Office
PTI	Public works and Transportation Institute
UNICEF	United Nation International Children Education for Fund
WAD	Waterway Administration Division

Chapter 1: Background

1.1 Context

Lao PDR with a population of about 5.7 million (2005) is a mountainous country, where elevation below 200m accounts only 16% of total area. Having a total area of 236,800 sq km, Lao PDR shares its borders with Thailand, Burma, China, Cambodia and Vietnam.



Topographically, most of the country is mountainous, with elevations above 500 meters, characterized by steep terrain and narrow valleys. The majority of population lives in lowland areas along the Mekong River and about 90 percent of the rural population practices farming dependent on rainwater for cultivation. Though the geographical location of the country provides protection from typhoons and windstorms, the country is exposed to various hazards, of which river floods and droughts are primary hazards causing widespread agriculture losses. Other important hazards include fires, landslides, rodent infestations, human and animal epidemics, UXO, opium addiction, and road accidents.

1.2 Background

Hazards

Floods and drought are considered the main natural hazards to which the country is exposed. Floods mostly occur in the alluvial plains of Mekong and its tributaries during the May-September monsoon season. Thirteen major floods have occurred over the past 35 years. The area most affected (central and southern regions) accounts for the zone of greatest economic activity in the country, where 63% of the country's population live. Typhoons that enter the country from Vietnam can compound the rainfall pattern and cause additional flooding. Given the situation explained above flood should be a concerned issue for the future within the lower Mekong River basin.

The areas most prone to drought are the western provinces and some of the higher elevations of the southern provinces. Drought affects about 20% of the country's population, adversely affecting agricultural production. Other potentially disasters event is fire (both urban and forest fire), agricultural pests and epidemics. During 1997-2000 more than 500 cases of fires were reported.

Since last decade the changing of the nature, climate and environment in the region and within the country, which along with human made intentional or unintentional made factors have worsen the situation. The degradation of the environment, opening more spaces, over logging, continuation of slash and burn cultivation practices, weakness on enforcement of using chemical peptizes and fertilizers among others made people more vulnerable and increased losses. For example, recent flash flood and land slide occurred in Houaphanh, Luangprabang and Vientiane provinces were never seen before in Laos. The flush flood and land slide in July 2001 in Vangvieng and Kasy districts of Vientiane province destroyed eight houses, all cultivation area, cut of national road for some time impacted to more than 200 families in four villages.

Box 1: Strategic Plan on Disaster Management of Lao PDR for 2010 to 2020

- Safeguard sustainable development and reduce the damage of natural or mandate disasters community, society and country economy
- Shift strategy from relief and mitigation after disaster impact to community, society and economy of government organization to preparedness before disaster strike emphasizing on flood, drought, landslide and fire parallel with continuing mitigate in post disaster period
- Turn from responsibility of only government agency to people centered in dealing with disaster by building capability for community
- Promote forever protection of the environment and country rich such as forest, land and water

Source: NDMO, 2000

Vulnerability:

Majority of the country's population does not have the capacity to cope with disasters due to poverty. Most inhabit the floodplains, making them vulnerable to the annual flooding. Its high population growth rate puts additional strain on environmental condition. Difficulties in access and communication are a major constraint in the country's development and in response to disasters particularly. Only a limited part of the country can be reached by "all weather" roads, and large parts become inaccessible in times of disaster.

Flood Background:

Flooding of the Mekong River and its tributaries are recurrent events and cause each year in varying degrees damage to agricultural production, rural infrastructure and human settlements, and results in losses in livestock and human lives. The floods occur during the monsoon period from August till November and are caused by the typhoons originating in the South China Sea.

The 1995 and 1996 floods were exceptionally serious. An analysis of flood levels of the Mekong River over the past thirty five years shows that only in 1961 and 1966 similar flood levels were reached. The floods of recent years show an upward cycle and 1994, 1995 and 1996 levels have been well above average. The damage to agricultural production has been substantial and exceptional, in particular in 1995 and 1996.

In Laos, flooding by the Mekong River in 1994 damaged about 28,000 ha of cropped land. The floods of 1995 and 1996 were the worst since 1966, seriously affecting the agricultural areas along the Mekong and its tributaries in the Prefecture of Vientiane, and in the provinces of Vientiane, Bolikhamxay, Khammouane, Savannakhet and Champassak. An estimated 87,300 ha were inundated in 1995 and 76,000 ha in 1996. Flooding in the Vientiane Plain in 1995 affected 153,398 persons; 26,603 households and 427 villages.

Box 2: Historic Flood Pattern

During the last 30 years (1966 to 1995), 22 notable floods have occurred with an average frequency of once in 1.4 years. Of these 22 historic floods, only four were large, covering the whole country (1966, 1971, 1978 and 1995), giving an average frequency of once in every 7.5 years. The 1966 flood is recalled as one of the most disastrous and probably the longest. It caused unprecedented water levels in the Mekong, inundation of large areas and extensive damage. Agriculture and agricultural infrastructure suffered the worst damage. The Laotian flood pattern is also distinct from that of Thailand or Cambodia since floods in Laos tend to be more 'flashy' and frequent than in Thailand, due to relatively high rainfall in the Lao mountains and the lack of regulation on its tributaries.

Table 1: Flood damages in Lao PDR

Land use	Damage	Percentage
Transplanted area	42,337 ha	41.14%
Stream, swamp, bamboo, grassland	10,140 ha	9.85%
Clear forest, hill and pasture area	31,354 ha	30.47%
Residential and other areas	19,081 ha	18.54%
Total flood area	102,912 ha	100%

Source: JICA executives' seminar on public works and management, 2005

Disasters have huge impact on children, especially those attending schools in times of disaster. The Mekong floods of 2000, where hundreds of children in Cambodia died and over 75 schools were seriously damaged, the 2006 mudslide on Leyte Island in the Philippines where more than 200 school children were buried alive, only reinforces the need to increase awareness of children and teachers of disaster and risk reduction. Thus teaching about disaster risk in school though school curriculum would help increase awareness and have better understanding among the children and teachers of their immediate environment in which they and their families live and work and help to reduce the risk faced by community. At the same time, investing in strengthening school building structures before disaster occurs, would reduce long term costs, protect the children and ensure educational continuity after event.

Realizing the importance of integrating disaster risk reduction (DRR) into development sectors, the Regional Consultative Committee on Disaster Management (RCC) program on Advocacy and Capacity Building for Mainstreaming Disaster Risk Reduction into Development (MDRD) was launched at the 4th Meeting in Bangladesh in March 2004. The program focuses on two separate approaches relating to mainstreaming DRR, namely, i) into over-all national development planning and ii.) into specific priority sectors such as Agriculture, Health, Education, Infrastructure, Housing, and Financial Services.

Cambodia, Lao PDR and Philippines have expressed their interest to initiate priority implementation projects to mainstream disaster risk reduction in education sector by integrating DRR modules into educational curriculum. The MDRD Education project includes four main activities, namely; i) Initiating Mainstreaming of Disaster Risk Reduction into Secondary School Curriculum, ii) Study on Impacts of Disasters on Education Sector, iii) Advocacy Workshop on Mainstreaming Disaster Risk Reduction into Education Sector, and iv) Stakeholder consultation as follow up to the Advocacy Workshop.

1.3 Objective

To illustrate the impacts of Disasters on Education Sector is the main activity for this study. The specific objectives of this study are:

- a. to build up evidence based rationale to raise awareness on integrating disaster risk reduction concerns into Education sector policy
- b. to advocate for changing practices in school construction and integrating disaster risk resilient features in school construction

1.4 Methodology

The methodology for this study is mainly based on secondary data and discussion with involved authorities. The methodology included:

- a. review of secondary materials from Ministry of Education and other sources
- b. interviews with key informant officials from Ministry of Education and other agencies

The following table (Table 2) has stated the Chapter of the study report, sources of data and the methodology used for each Chapter.

Table 2: Chapters of the study, sources of data and methodology

Chapter	Sources	Methodology
<i>Introduction</i>		
The Department of Education: Structures, Functions Relations with other departments, Major Programs and methods and system	MOE	Review of Secondary materials from DOE and other sources Interview with Key Informant Officials of DOE and other agencies
<i>Social and Economic Impact</i>		
Basic Statistics	NDMO	Secondary Materials
Disruption/Impact of Disasters	School at Khammoune province, Champasak province and Vientiane province	Secondary Materials Survey Questionnaires for selected 3 schools
<i>Physical Impact</i>		
Organizational Structure of Dept of Education for Building Construction	Department of Personal and Organization	Secondary Materials Interview with Key Informant Official
Impact of Past Disasters	Department of General Education	Secondary Materials Interview with Key Informant Official
Analysis of the Budget for Education and Building	Department of Planning and Foreign Relations	Secondary Materials Interview with Key Informant Official
Process of School Building Construction	Department of General Education	Secondary Materials Interview with Key Informant Official
Review of Standards and Guideline	Department of General Education, Department of Teacher Training, JICA, UNICEF, KOICA, World Bank, ADB, Save Children Australia	Secondary Materials Interview with Key Informant Official
Review of Typical Plans for School Building	Department of General Education, Department of Teacher Training, JICA, UNICEF, KOICA, World Bank, ADB, Save Children Australia	Secondary Materials Interview with Key Informant Official
Pipeline and Continuing Projects for Building Construction	Department of General Education, Department of Teacher Training, Department of Planning and Foreign Relations	Secondary Materials Interview with Key Informant Official and reviewing different documents
Recommendations	Department of General Education,	Interview with Key Informant Official

Chapter	Sources	Methodology
	Department of Teacher Training, JICA, UNICEF, KOICA, World Bank, ADB, Save Children Australia School Principles	
Case Studies		Secondary Materials

1.5 Area of study

The natural disaster prevention and protection in the Lao PDR is anchored in the environmental Protection Law of country. "Disasters are extremely harmful incidents which occurred either naturally, are man made or caused by other reasons. They affect health, life, belongings, and others. Disaster in Lao PDR can be: Floods, droughts, land slides and Erosion, Fires, Typhoons, Pets' epidemics and Earthquake. Disasters that mentioned are effecting seriously to communities, Schools, Paddy field and others. In this report will focus mainly only Urban Fire, Flood and Windstorm, Earthquake.

A. Fire

Between 1997 and 2007, there were more than 2000 incidents of fire in the country. In the last decade climate changes in Lao PDR due to man made interventions have led to degradation of environment, larger open spaces, increased forest logging, slash and cultivation practices and weakness in enforcement of using chemicals and fertilizers have made communities more vulnerable.



Table 3: Statistic of damages caused by Fires

Year	No. of incidents	No. of death	No. of injuries	Cost of damage (million kip)	No. of building was fired
2001	136	1	9	54.351	149
2002	141	3	4	16.932	207
2003	129	3	6	11.894	294
2004	131	7	3	11.910	321
2005	95	0	5	6.337	347
2006	114	1	1	13.891	1.232
2007	207	10	10	19.598	326

Source: Department of Fire Prevention and Protection, 2008

Table 4: Causes of Fire

Year	Cigarette	Electricity	Cooking	Candle light	others	Total
2001	3	19	22	20	76	136
2002	2	22	10	2	105	141
2003	2	29	18	29	31	129
2004	5	24	54	22	26	131
2005		20	25	23	27	95
2006		35	15	22	42	114
2007		33	65	20	69	207

Source: Department of Fire Prevention and Protection, 2008

B. Flood and windstorm

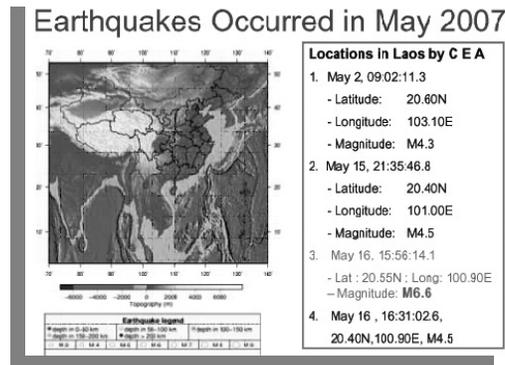
In the last three decades, Laos has experienced serious floods with an average re occurrence of every 1.4 years. Flood from the Mekong River and its tributaries take place during the monsoon season and have the greatest macro-economic impact on the country and affect a greater number of people, as the areas affected are primary locations of economic activity and inhabit 63% of country's population.



Twenty-seven "major" floods have occurred in Lao PDR during 1966 to 2002, of these historic floods only 6 were large floods: 1966,1971,1978,1995, 1996 and 2002. 1995 and 1996 saw the worst flooding in central and southern provinces with over 28% of the country's paddy crop destroyed and extensive damage to road and public infrastructure. Estimated as one of the more serious recent floods, the flood in 2000 affected 12% of the population and destroyed about 8% of the national wet season cultivation area.

Flash flood have occurs in the upper reaches of the Mekong tributaries when the effects are destructive but brief and localized. There is a trend towards more frequent flash flood caused by severe deforestation in the hill areas of northern Laos.

C. Earthquake



Event this information of earthquake was not effect seriously to health, life, belongings, and others but it is necessary to study about earthquake. Since Laos has no any seismic station, data and information of earthquake occurring and nearby locations have been acquired through websites of surrounding countries such as China and Thailand. Some records are states: Four earthquakes in May 2007, two earthquakes in early June 2007.

Chapter 2: Institutional Arrangement for Disaster Mitigation and Education

2.1 Organizations relevant to disaster reduction

The management of disaster in Lao PDR is based on the Law on Environment Protection that issued by Prime Minister No. 158, date 1999. There are very well structure of key actors who respond for disaster management at national level and local level. The National Disaster Management Committee (NDMC) was set up to work on disaster mitigation, prevention and reduction.

National Disaster Management Committee (NDMC) has task force as following:

- NDMC as a center of coordinating for responsible to disaster preparedness and management at national level.
- Making plan on disaster management
- Collecting all data on disaster victims and make requests for assistance.
- Mobilization from individuals, organizations, internal and external in kinds and money for disaster management.
- Setting up public awareness program on disaster mitigation. And integrate the subject on disaster management, environment and natural conservation into school curriculums.
- Preparing the direct relief operation plan, preparedness, response and rehabilitation by using government budget and with contribution of concerned agencies and International organizations and non-governmental organizations.
- Coordinate and enhance provincial governors to establish provincial and district disaster management committee.

The roles and responsibilities of NDMC members are different from each other that based on their organization. MOE has following roles and responsibility to cope with disaster:

- Appoint DM Contact Person in MOE and coordinate for establishment of focal points at province, district, and educational institutions as needed.
- Responsible for integrating DM concept into education programs in schools, organize DM training on safety living with hazards and managing of the nature and environment for teachers and students.
- Responsible for organizing evacuation of students and population when disaster strikes, temporally using educational building to shelter for victims.

The National Disaster Management Organization (NDMO), found under the umbrella of MLSW, has the overall responsibility on disaster management for all hazards (Floods, Drought, Fire, and road accident) at the national and local level. One of the main functions of NDMO is to create a good atmosphere for cooperation and to build a culture for coordination between various sectors in disaster management. Organizations which have been developed at the central and provincial levels function through a focal point, which initiates monthly or bi-monthly meeting through the NDMO.

As a central coordination point, the NDMO will set up a link with the provincial authorities. A good example to mention here is from the floods of 2000 and 2001, where the information and data collection of the flood was conducted more effectively with more satisfaction and accuracy when compared with previous years.

MAF serves as the key organization for undertaking mitigation measures related to floods and droughts. In the recent years, the national level Flood-Drought Prevention Coordination Committee (FDPCC), established by the Prime Minister's Decree No. 29/PM, 2002, has play

and important role in response to flood and drought. The Minister of MAF issued a decision for the establishment of FDPCC in the year during more than normal.

The Minister of MAF is the president of this committee who is responsible to address flood and drought prevention. FDPCC includes staff from MAF with the post of chairman held by Vice Minister of MAF. The role and responsible of this committee includes follow-up on events, advice on the methodology and measurement of flood prevention country-wide, coordination with relevant organizations to encourage civil society to participate on prevention, mitigation and affect from flood. The committee has divided the country into 4 zones and sub-committees (general and secretariat and one committee in each zone). The general committee coordinates with each zone committee that report to the Minister. The committee in each zone coordinates with the Department of Agriculture and Forestry of provinces, municipality, provincial governor and district governor to formulate the plan for implementing flood and drought prevention and mitigation measures. The general committee also coordinates with relevant organization to mobilize resources and equipment for preparedness and mitigation of floods and drought.

The Ministry of Public Security (MPS) is responsible for security and society safety in case of disaster occurs. The detail is as following:

- Appoint Disaster Management Contact Person in management and coordinate to establish focal point at the province, district and other units.
- Responsible for National Search and Rescue Team (NASRET).
- Responsible for training on Disaster Management and organizing simulation exercise joining by policemen and civilians.
- Responsible for joint emergency operation in disaster situation and mitigation in post disaster period.

Fire Prevention and Protection Department (FPPD) has been established under MPS. Its responsible is for the prevention, protection, mitigation and risk management of fire hazards. The key pre-disaster activities include the preparation and the provision of material and equipment support for fire hazards.

Department of Meteorology and Hydrology (DMH) and the Waterway Administration Division (WAD) is responsible for hydrological and meteorological data collection. DMH is assigned to provide hydro meteorological and advisory services to the Minister of MAF. DMH operates 74 hydrological stations, 86 rainfall stations and 34 meteorological stations while the WAD operates 64 hydrological stations and 23 rainfall stations, all installed along the Mekong River and its tributaries.

The Ministry of Public Work and Transport (MPT) is responsible to study the policy and strategy relevant to communication, land, water, and train transport, housing, urban planning and water supply propose to government for consideration. Manage, improve and expand all level of road, bank protection activities. Manage a system of transport on land, water, sea, air and trail. Manage driving license, technique of all type of vehicles for transportation (except vehicle of National Force, and National Security). Manage housing, building construction, urban planning and water supply throughout the country.

Public Work and Transport Institute (PTI) is mandated to undertake town planning, developing zoning regulations and undertake research and training activities throughout the country. PTI has also developed decision support tools for disaster reduction such as a hazard maps and disaster risk communication tools for public information. The main hazards where they have focused includes fire, floods and road accidents in urban areas.

The Ministry of Public Health (MOH) is responsible for relief and disease prevention in case of disaster occurs. The detail is as following:

- Appoint disaster management contact person in MPH and coordinate for establishment of focal points at province, district, institutions and major hospitals as needed.
- Responsible for direct involvement of medical teams in emergency operation: first aid, health care and issues "DIED CERTIFICATE" for victims.

- Responsible for stockpiling some medical equipments and medicines for emergency.
- Responsible for hygiene activity and control of disaster born diseases and organizing specialized training for medical teams working in emergency and in post disaster period.

2.2 Disaster Management, Mitigation and vulnerability of the country

The Lao PDR, similar to the other countries in the lower Mekong River Basin, is now either experiencing floods or bracing for them as the monsoon sets in and the rains increase. This is due to a combination of factors including very heavy rains in southern China and northern Laos, tropical storms over the South China Sea and the effects of 'El Nino'.

In dealing with disaster problem in Laos especially with flood in the past much more depended to the perceiving to problem of Authority in organization and community themselves. The Government has paying more attention on disasters to disadvantage groups of people who had been victims of natural disasters with emphasized on relief and mitigation after disaster struck. For example: supplied of water, seeds, rice, medicines, chemical peptizes, distribution of relief goods, building of weir and embankment, irrigation and other. Since 1993 government has allocated annual budget for those activities from 500 to 1000ml kips for emergency relief to victims of disaster in country. In implementing those activities, other government agencies and privates, international organizations, friend countries, inter NGOs were also participated and contributed with their resources which could held mitigate with foods and shelters to victims, allowing for victims disaster to recover and return live cycle to normalcy after disaster struck. Nevertheless we had mentioned that managing disaster we

Box 3: Opportunities and Lessons Learned

- Representatives of several sectors in the NDMC are still not clear about their roles and responsibilities
- Weak cooperation and collaboration between sectors
- Need to improve early warning information and its dissemination to the grass roots level
- Public awareness and education especially on the consequences of floods and drought
- Appropriate solutions (e.g. relocation of village, disaster risk reduction strategies, and new or adapted cultivation techniques) are needed.
- Integrating Disaster Management concept into other projects of urban and rural development with focused on flood, drought, fire, land management, bank erosion, water management. Protection of environment, forest and other natural resources.
- Appropriate legislation should be drafted that provides financial resources for disaster preparedness and mitigation.

Source: NDMO presentation, workshop on Policy, Legal and Institutional Arrangements and Planning for Disaster Management, 2004 Vientiane Lao PDR

still weren't proactively dealing with arising problems, beside that the lacking of necessary regulation, codes in implementing and procedures in coordination are also require for carefully study to understand real courses of problem and design from the strategy, priority, concept and select appropriated measures for realization in new term.

The National Policy on Disaster Management formulated adopts an all-hazards and people-centered approach to disaster management, and recognizes that disaster risk and vulnerability reduction are essential to sustainable development planning. The National Plan for the period 2001-2020 has been formulated, while provincial disaster management plans, which mirror the national plans but are made specific to the risk, hazard and vulnerabilities of the particular province, are under development.

Priorities for action are capacity building of disaster management personnel from national to community levels, early warning systems for floods and drought, public awareness,

among other preparedness, prevention and mitigation, and response and recovery activities identified.

Major deficiencies concern the limited capacities and financial mechanisms at the provincial and district levels for carrying out management and development activities at local levels,

continued appropriate training and establishment of support services are needed at provincial and district level. This needs to include training on the interpretation of data and information collected to allow the identification and classification of focal sites to form the basis for promoting land use, water resources and forestland management plans to be tailored to different recommendation domains

The legal enforcement related to the natural disaster prevention and protection, the Lao PDR has acceded to many legislation and national priority programs, which address issues essential to the country's present and future environment well being and natural resources for sustainable development. Currently very little implementation, legislative or physical, has been undertaken. Many elements of the disaster protection management have not yet been addressed legislatively, and should be dealt with right away. (NDMO country report 2004)

As "Majority of the country's population does not have capacity to cope with disasters, due to poverty. Most inhabit in the floodplains, making them vulnerable to the annual flooding" and "Difficulties in access and communication are a major constraint in the country's development and in response to disasters particularly", Only a limited part of the country can be reached by "all weather" roads, and large parts become inaccessible in times of disaster.

2.3 Ministry of Education (MoE)

The Ministry of Education (MoE) is a state organization at the central level within the government apparatus, which is responsible for the macro-management of education throughout the country, focusing on capacity building and the improvement of social and scientific knowledge of the nation, increasing patriotism and solidarity among ethnic groups, increasing international solidarity, awareness of national benefits and the obligations of the community, preserving national cultures, educating people to be economical and aware of public and individual benefits, aware of self-reliance and self-motivation, the availability of theoretical and scientific-technical knowledge, the physical health of the nation, creative capacity and intelligence.

MOE has the following functions and scope of authority:

- To study and implement the party's guidelines and policies, laws, decrees, resolutions and orders, and regulations enacted by the government;
- With regard to national policies, to provide training both inside and outside the country in relevant fields at all levels, to increase and improve the knowledge of technicians, engineers and professional staff;
- To administer and manage schools and institutes at all levels, and across all sectors including:
 - ❖ Managing and inspecting general education schools throughout the country;
 - ❖ Directing the management of teacher training schools and colleges, vocational schools, and other education institutes belonging to MOE;
 - ❖ Supervising the educational methods and the educational regulation principles for private schools;
 - ❖ In cooperation with other ministries, managing educational methods and regulations for those schools which are not under MOE;
 - ❖ Assisting the Lao Buddhist Relations Organization to manage schools and colleges for monks;
- **To identify standards and approve the design of buildings, the selection of locations, and any materials used in teaching and learning activities.**
- To mobilize the whole society, particularly the parents of students, to participate in education development;
- To liaise with, cooperate, seek funding sources, and exchange experiences with other countries, international organizations, and education development agencies;
- **To approve the design of buildings, their location, equipment and material for teaching and learning purposes.**

Organization structure

The organization structure of the education sector at the ministry level consists of:

1. Office of the Minister
2. Department of Organization and Personal
3. Department of Finance
4. Department of Planning and Foreign Relations
5. Educational Inspection Committee
6. Department of Teacher Training
7. Department of General Education
8. Department of Informal Education
9. Department of Vocational and Higher Education
10. Department of Private Education
11. Department of Physical Education

Organizations at the department level that belong to the Ministry of Education include:

1. National Educational Science Research Institute
2. The Secretariat of the Lao National Committee for UNESCO

Organizations at the local level consist of:

1. Provincial, municipal education offices
2. District offices of education

2.4 Structure of the education sector

The Ministry of Education (MOE) is responsible for formal and non formal education at all levels. Formal education in Lao PDR consists of five stages: primary education (five years), lower-secondary education (three years), upper -secondary education (three years), post-secondary education (one to two years) and tertiary education (three to seven years). Primary school is compulsory, while the private sector is encouraged to provide nursery and kindergarten schools. Specialization starts following lower secondary or upper secondary school levels, where three stands are offered: academic, vocational and teacher training. Non formal and technical education complements and supplements the general schooling provision. Non- formal education (NFE) and training includes basic literacy and innumeracy training, and a wide range of programmes for youth and adults. The National University of Laos offers tertiary education.

In addition to the public provision of education, there is also private sector provision, for which MOE has oversight responsibility. During the past 12 years, with the assistance of international organizations, investments has been made in basic education programmes, school construction, the establishment of Community Learning Center and the production and distribution textbooks, with the result that access to basic education has show some improvement . However, education services are still insufficient to meet the needs of the population.

MOE has prepared the Education for All National Plan of Action (EFA NPA) for 2003-2015 seeks to accomplish three major tasks: equitable access, improved quality and relevance, and strengthened education management.

2.5 Existing infrastructure of the education sector

During the past 12 years, with the assistance of international organizations, the Government has put a lot of effort and investment into basic education programmes, particular school construction, the establishment of Community Learning Centers (CLCs) and the production and distribution of textbooks. Although it is still inadequate, access to basic education has shown some improvements must be made in order to achieve the "95% survival rate to grade 5" government target. Only through continued concerted effort will the country begin to achieve this desired level.

1. Education for All National Plans of Action (EFA NPA) for 2003-2015 has targets and programs to improving access and participation as following:

EFA is the National Plans for Education Sector which is issues by MOE therefore this plan has to follow by stakeholders in Education sector. EFA has mention clearly about program plan; there are 5 main programs that related to the school construction plan that raise in this report.

Program 1: Access and participation in Early Childhood Care and Development

- Plan the development of early childhood care and development
- Build new kindergartens and improves existing ones
- Train, recruit and deploy preschool teachers to meet increased demand
- Mobilize communities in favor of ECCD and pre school education and promote the development of kindergartens and pre school community centers

Program 2: Access and participation in formal primary education

The purpose of program is to generalize access to, participation in and completion of primary education.

Table 5: Primary Target- enrollment, Recruitment of Teachers/staff and classroom construction

School year	Total enrollments	No. of teachers to recruit	Replacement teachers	No of classrooms
2004/05	872,665	1,736	1,942	1,335
2005/06	865,764	1,628	1,922	1,335
2006/07	857,295	1,575	1,901	1,335
2007/08	844,647	1,435	1,871	1,335
2008/09	838,974	1,657	1,858	1,335
2009/10	842,746	1,969	1,865	1,335
2010/11	852,907	2,267	1,890	1,335
2011/12	867,869	2,340	1,918	507
2012/13	878,056	2,213	1,937	362
2013/14	885,733	2,149	1,950	285
2014/15	888,979	2,016	1,954	263
2015/16	891,469	1,993	1,957	263

Source: Education for All, MOE 2002

- Develop the school network in such a way as to provide all children aged 6+ accessibility to a complete multi-grade or single grade primary school, in accordance with agreed upon norms of minimum and maximum class size
- Train, recruit and deploy primary teachers according to needs, as determined by the annual school mapping program
- Promote demand for primary education from girls, ethnic groups and poorest families
- Improve access of children with special needs in all provinces to complete at least primary school
- Increase access of socio-economic difficult children to complete at least primary school

Program 3: Access to and participation in Lower secondary education

The purpose of the program is to progressively increase access to and completion of lower secondary education, while eliminating gender disparities and promoting the participation of ethnic groups and the poorest children.

Table 6: Lower secondary target - enrollment, Recruitment of Teachers/staff and classroom construction

School year	Total enrollments	No. of teachers to recruit	No of classrooms
2004/05	251,625	1,015	328
2005/06	262,500	1,092	360
2006/07	277,715	1,319	472
2007/08	298,147	1,603	611
2008/09	313,890	1,493	531
2009/10	321,501	1,219	364
2010/11	414,924	5,023	2,462
2011/12	421,109	1,178	150
2012/13	430,609	1,337	230
2013/14	450,031	1,792	471
2014/15	479,666	2,281	719
2015/16	514,186	2,560	837

Source: Education For All, MOE 2002

- Develop the Lower Secondary Education (LSE) school network in such a way as to provide all children aged 6+ accessibility to a complete multi-grade or single grade primary school, in accordance with agreed upon norms of minimum and maximum class size
- Train, recruit and deploy LSE teachers according to needs, as determined by the annual school mapping program
- Reduce dropout rates in lower secondary schools, especially in rural and remote areas
- Increase enrollment of disabled children

Program 4: Youth and adult literacy

- Develop a comprehensive non-formal education policy, strategy and plan
- Advocate for strong political commitment to organize promotion campaign to motivate youth and adults to participate in Non-Formal Education (NFE) literacy and adult vocational skills training programs
- Revise, develop and produce sufficient national and local NFE curriculum, adapting to specific needs of target groups
- Establish a standard system for training NFE staff, trainers, facilitators and teachers
- Establish a non-formal school system for school dropouts and children not attending formal primary schools
- Provision of non-formal primary education to children and youth in disadvantaged areas
- Raise the literacy rate of adult population

Program 5: Skills development program for disadvantaged groups

- To improve and develop an effective vocational and rural skills training program to disadvantaged groups
- Coordinate actions with those Ministries involved in providing vocational and rural skills training and micro-finance services for disadvantaged groups

2. Number of school, student teacher

Based on the information from MOE, EFA, the number of students in primary school class in increase more than expects, the expectation is 735,500 in 2000 to 889,600 by 2015. There are strong disparities between gender, ethnic groups, poor, non-poor, urban, rural and remotes areas. Low enrollment and completion rates are

concentrated among children in rural, remote and ethnic group areas, particular children from low income families and ethnic group children in poor districts. School facilities in rural areas, in general, are mostly temporary facilities lacking play and learning material especially refer to disaster awareness as well as basic sanitation facilities like clean water and toilets

Table 7: Number of schools, teachers and students in school year 2005-2006

School types	No. of schools	No. of teachers	No. of students
Kindergarten	1,087	2,882	49,197
Primary	8,651	27,776	891,881
Secondary school	980	15,132	345.488

Source: Planning and Foreign Relation Department, MOE 2007

3. EQIP II

Education Quality Improvement Project II (EQIP II) was funded by Asian Development Bank (ADB), the project was divided into phases with different location and number throughout the country as phase 1 constructed 42 schools, phase 2 constructed 70 schools, and phase 3 constructed 71 schools. Table 8 will also explain the number of classroom constructed and repair with different province

Table 8: number of classroom constructed and repair by project

No.	Province	Number of class room	
		construct	repair
Phase 1			
	Bokeo	40	12
	Luangprabang	47	5
	Xaiyabouly	37	0
	Savnakhet	32	19
	Total for Phase 1	156	36
Phase 2			
	Bokeo	48	137
	Luangprabang	65	8
	Xaiyabouly	49	136
	Savnakhet	119	114
	Total for Phase 2	281	395
Phase 3			
	Bokeo	28	19
	Luangprabang	72	62
	Xaiyabouly	66	126
	Savnakhet	127	311
	Total for Phase 3	293	311
	Total for phase 1,2 & 3	730	742

Source: General Education Department, MOE 2007

4. Education Development Project II (EDP II)

EDP II fund by World Bank and implementing from 24/01/2005 to 28/02/2010, it aims to focus on capacity building for community by train them with the participatory approaches on construction and management, create the income for village and community to reduce the poor by using and buying material and labor from local, provide opportunities to community for basic education. Project is in 19 poorest with in 6 provinces namely: Phongsaly, Oudomxai, Luangnamtha, Hoiphanh, Xekong and

Attapeu. The total budget of project is 13,5 million US dollars which is including loan 5.3 million US dollars, grant aids 7.7 million US dollars and government fund 0.5 million US dollars.

Table 9: Project result from 24/1/2005 to 30/10/2007

Provinces	Construction plan from 2005-2010		Construction Plan from 2008-10		Constructed		Finish
	School	Classroom	School	Classroom	School	Classroom	School
Phongsaly	35	119	0	0	35	119	100%
Luangnamtha	50	150	0	0	50	150	100%
Oudomxai	98	265	18	45	80	220	81.6 %
Hoiphanh	84	261	11	34	73	227	86.9 %
Xekong	31	85	29	79	2	6	6.45 %
Attapeu	21	77	10	33	11	44	52.38 %
Total	319	957	68	191	251	766	78.68 %

Source: General Education Department, MOE 2007

5. Basic Education Girls Project (BEGP)

BEGP funded by UNICEF. The project is focus to construct new school and repair existing school. In Luangprabang and Xiengkhuang, it is aims to construct school replace to the existing location which existing school is not good condition or can not use. Total budget for each school is 55,000 USD to 60,000 USD. The school will be five classrooms, principle room, teachers room, provide clean water, toilet and electricity if network available. In 2009, they plan to provide 100 schools with 100% grant aid for construction but operation and maintenance will respond by community. In Luangnamtha, Phongsaly and Oudomxai, project is also provide fund for repair existing school by providing construction materials with total budget of 10,000 USD for each school and community has to contribute labor and wood.

6. JICA

The objectives of the project are to construct new primary schools in Vientiane Capital and Vientiane province, transforming them from deteriorated and temporarily built structured classrooms to an improved educational environment for primary school education and to maximize the number of students attending the permanent school.

Continuous efforts of the Education Strategy Planning of the Laos Government are gradually expending access to primary education. However, school facilities for primary education have not been well developed, and construction of about 6,000 new school buildings is required in order to achieve the targeted enrollment ratio in the future. Thus, Vientiane Capital and Vientiane Province are the target area of the project supported by JICA. The number of school constructed by JICA's fund is summary in the table below:

Table 10: Primary schools constructed by JICA project

	Vientiane Capital	Vientiane Province	Total
Number of program schools	38 schools	39 schools	77 schools
Number of classrooms	179 classrooms	212 classrooms	391 classrooms

Number of teachers' room	29 rooms	26 rooms	55 rooms
Number of toilet buildings	14 toilet buildings	27 toilet buildings	41 toilet buildings
Total floor area	12,083.56 m ²	13,930.15 m ²	26,031.71 m ²

Source: JICA, Project document, 2003.

A classroom type in each school was planned according to the number of insufficient classrooms of each school, based on combinations of "5 classrooms + teachers' room" (6 classrooms when a teachers' room is diverted for classroom purposes) and "3 classrooms + teachers' room" (4 classrooms when a teachers' room is diverted for classroom purposes). In addition, teachers' room and toilets were planned only when the schools had no available teachers' room and toilet.

7. KOICA

KOICA provided 2 primary schools in Luangprabang Province and Vientiane Capital with total budget of 98,500 \$ and one vocational training center in Vientiane Capital with the total budget of 200,000 USD.

8. Save the Children, Australia (SCA)

SCA provided assistant to improve the quality of primary education and mainly focus to remote and poor area. Xayabury District is the location of Project to construct and repair schools

Number of school construction supported by project from 2001-2007

- Constructed 5 primary schools, with total cost of 150,000,000/kip per school.
- Repaired 6 primary schools.
- All schools settled at Xayabury District,
- School building includes three class rooms and one library.
- Structure of building comprise of concrete column, brick wall, and galvanized iron sheet roof.
- A plan of school building developed from MOE format, which apply for primary school in the whole country, especially room dimension.

2.6 Budget allocation for school construction and maintenance

This is not clear in the budget line of MOE for school construction and maintenance but due to the requirement of donor agencies for project assistant the Government of Lao PDR has to contribute to the project at least 5 to 30 percentage of total cost of assistant project. With in the MOE budget from 2000-2005 (please see the Table 16 - Table 20), there is no line for new school construction due to limited budget allocation from central government.

To construct new school is totally based on the donor agency's funding. The government of Lao PDR also has policy to encourage private sectors to invest on education sector; therefore the private sector construct number of schools with different level including kindergarten, primary, secondary and intensive schools, and due to no specific regulation for school construction therefore some of private schools are bad condition for students to sit whole day and students, high risk to fire because of inflammable construction material and facilities to prevent fire. Most of the schools have to cover the regular maintenance cost which they do not have the resource therefore public schools have to collect money, material or any kind of contribution from students parents.

Chapter 3: Physical Impacts of Disasters in the Education Sector

3.1 Documentation of damages to structure

The documentation of damages to school structure is not proper record, it was only simple and key information were record however the information of year 2002-05 indicates that 103 schools were affected from flood and 60 schools were affected from windstorm, it was mostly affected to school structure such as roof, wall and floor. ***It was great loss due to cost of structure. The social economic impact does not record that how it great affected to life, community, children and teachers.***

Table 11: Cost of loss from natural flood and windstorm to school in 2002-2005

Provinces	No. of school effected by flood	No. of school effected by windstorm	Cost in LAK Unit '000	Cost in (1 USD= 9270 LAK)
Vientiane Province				
Phonehong		6 schools	255,000	27,508
Viengkham		1 school	6,615	713
Kasi		4 schools	83,105	8,964
Feung		7 schools	252,247	27,211
Sanakham		3 schools	163,840	17,674
Mad		1 school	5,000	539
Thoulakhom		2 schools	52,000	5,609
Khammoune Province				
Thakhek District	3 schools		5,950	641
Hinboun	19 schools		145,065	15,648
Nongbok	20 schools		96,980	10,461
Sebangfai	8 schools		12,592	1,358
Mahasai	29 schools		117,550	12,680
Boilapha		3 schools	32,400	3,495
Savanakhet Province				
Khanthabouly		3 schools	100,000	10,787
Xaibouli	19 schools		222,100	23,959
Bolikhamsai Province				
Paksanh District	1 school	1 school	No cost reported	
Thaphabat		3 schools	No cost reported	
Pakading		6 schools	No cost reported	
Bolikhansai		4 schools	No cost reported	
Khamkeut		3 schools	No cost reported	
Saravanh Province				
Vapi		1 school	30,235	3,261
Luangprabang				

Provinces	No. of school effected by flood	No. of school effected by windstorm	Cost in LAK Unit '000	Cost in (1 USD= 9270 LAK)
Province				
Luangprabang		1 school	8,000	862
Nanh		2 schools	7,500	809
Pak-Ou		1 school	2,600	280
Xekong Province				
Thateng		1 school	24,674	2,661
Vientiane Capital				
Nasaithong District	1 school		No cost reported but school delay opened	
Pakgeum	2 school		No cost reported but school delay opened	
Sikhothabong	1 school		No cost reported but school delay opened	
Oudomxai Province (2006)			135,036	14,567

Source: Ministry of Education, General Teacher Department

Table 12: The flood damages in 2005 by MAF and NDMO

N0	Description	Damages in 2005
1	Provinces	8
2	Districts / Villages	84 / 2510
3	Families / people affected	85.533 households / 480.913 persons
4	Rice fields affected	87.725 ha flooded (panting areas in 2005 is 684.555 hectares)
5	Damaged rice fields	54.775 hectares damaged
6	Livestock damaged	14.941 heads (buffalo, cattle, pigs and poultry)
7	Fish ponds damaged	4289 sites = 609 hectares
8	Irrigation affected	1.421 projects sites
9	Irrigation damaged	117 schemes
10	Irrigation channels	15.124 meters affected by landslide
11	School affected	102 schools
12	Route affected	225.726 kilometres

Damaged cost: 218.304 USD

Data sources from MAF, October 2005

Table 13: Number of School was fired in 2000-2007

Year	Number of incident		Place
2000	None		
2001	None		
2002	None		
2003	1	1 building of school	Vientiane Capital
2004	1	1 building of school	Vientiane Capital
2005	None		
2006	None		
2007	1	1 class room	Houaphan Province

Source: Department of Fire Prevention and Protection, 2007

The number of schools affected to fire recorded is not big number, it may due to the recording was not well prepare, or Schools are aware of fire due to school structure and also children and teachers awareness. Department of Fire Prevention and Protection has annual plan to evaluate schools condition on Fire Protection and Prevention.

3.2 Present methodology of School design and process

The design of building structure for housing and school are quite similar that based on the architecture who response to design a building. **There is no building code apply in the country.** There is no organization response directly to do risk assessment mapping for disasters in the country.

At present, the design of school building (for primary school) can divide into two major sectors are as following: (i) government sector, and (ii) other sector.

- (i) School investment by government
 - New design, the design of building is responsible of the Provincial education office but most of the design will hires private company to design and draw the plan but they have to follow the guideline of MOE. Then, the project document will submit to the Division of Design and Construction Management (under Department of Finance) for comment. After that, building plan will sent to Provincial Education Office for approval.
 - Adopt a plan from standard of MOE, the Provincial education office will adopt a plan from standard of MOE to appropriate with real situation of location. Majority of adaptation is only material for wall, roof, and furniture, for main structure such as column, beam, floor, and other structure which need resistant to disaster do not change.
- (ii) School invest by donors and private sectors
 - New design, the design of building is responsible of project consultants (project engineer) with following to the Guideline of each Donors or MOE. The plan will submit to relevant organization for approval such as Department of General Education approved for UNICEF project, EQIP II, and JICA. Department of Planning approved for project of EDP II. Department of Teacher Training approved for project of EQIP II

The design and design process of school by various projects is little bit difference from each other but however it can be summary as following:

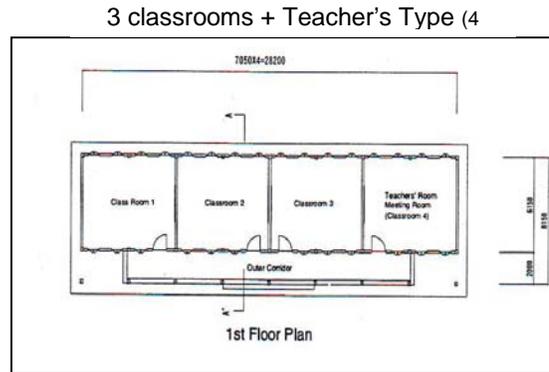
A. Site selected

The selection of school location is very important step for the construction therefore most of school location will agree and provide by villager. Almost new schools construct at the existing school area, due to (i) some of old buildings still can use for

teaching during the construction of new school, (ii) or it will use for storage equipment and material.

B. Classroom design

The number of classroom at each school will be designed (calculated) by number of pupils. The number of pupils per one classroom will be 40 (one classroom per one grade), and 70 (one classroom per two grades, for example grade 1 and 2 are tough in one classroom by one teacher). Classroom dimension (7 x 6 meter) is WB standard, which is applied for classroom design by other projects such as JICA, ADB, and UNICEF.

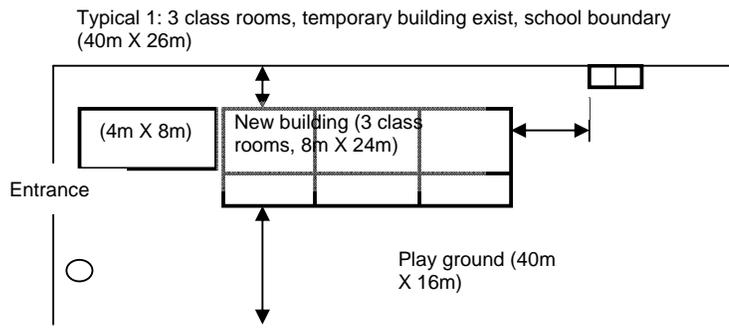


Classroom types are depended on the project such as: (i) JICA project designs for 4 rooms (3 classrooms + administrative room), and 6 rooms (5 classrooms + administrative room). (ii) ADP II project designs for 3 rooms (2 classrooms + administrative room), and 6 rooms (5 classrooms + administrative room). (iii) ADP II project design for 6 rooms (5 classrooms + administrative room).

C. Master plan design

Master Plan design will focus on facilities of school building, water source, playground, and entrance direction. The design of master plan will be varies from project to project, and location to location which based on dimension of plot, and topographical of land. Location of school building will be located based on an agreement of site engineer and village committee in accordance to community preferable and safety for disasters (**mainly for flood protection**).

The school mostly locate near the boundary of plot with distant at least 2 meter, because, major land needs to preserve for play ground and student activities. Toilet will be located at the back of school building with approximately about 2 meters from fence and at least 30 meters from water source. Water source should be located near the entrance incase of this source will share with villager.

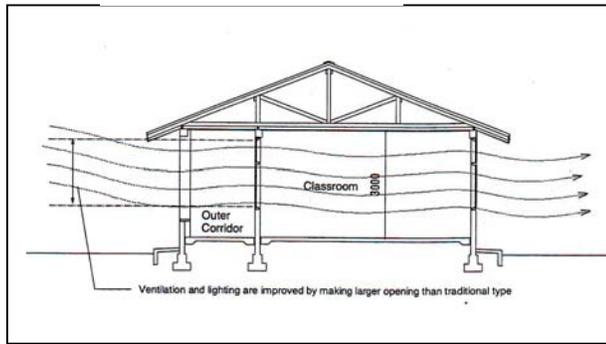


Other consideration of designing master plan is natural condition which may be affected to students and teachers. To avoid direct strong sun light, school building should locate along East-West axis. The building should design for natural ventilation and natural light that related to size of window and tree shade.

D. Structure design

The design of building structure is the most importance part of design process, because the resistant of building is very importance to life of students, teachers. The Architect or engineer who did the design must to calculate the resistant of structure, **Therefore, the main structure of building such as foundation, ground beam, column, roof beam and roof structure must be strong and resistant to disaster such as earthquake, windstorm, land slide, and flood.**

Standard classroom



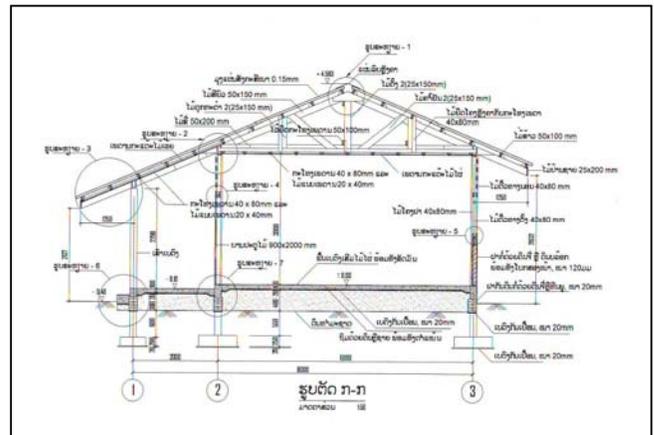
As most of the schools constructed were only one floor therefore wind force and earthquake force did not take into account for designing or even constructive. Much more the structure of school usually tries to design for ventilation and not face to direct sun. Lao PDR has not experience to earthquake therefore the information about earth rather than rare.

Designing the foundation is based on the experiences of local contractors because they are experienced on the location and they know the capacity of foundation can carry weigh of school structure.

The factors considered for designing a school building are as follows:

- Life span 20 to 25 years.
- Building types are varies such as a Block method (BL method), a Reinforced Concrete method (RC method), and a Pre-cast Concrete method (PC method)
- Hard wood roof structure
- Roof materials are fiber cement/ galvanized iron sheet tile
- Floor is concrete
- Wall is plastered brick or limestone/ wooden plank and upon the existing variable local materials
- Ceiling: plank wood/ woven bamboo
- Door and window: wooden plank/ply wood

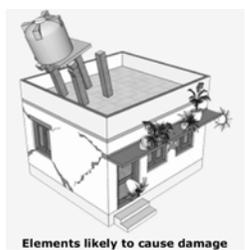
Mostly school structure design is mainly try to protect windstorm and flood but Earthquakes and land slide hazards do not take into account, while schools in urban area is design to prevent and protect fire. School structure design in Lao PDR is based on the local environment and natural condition, experiences on practical construction, technical guideline which provide by MOE for school construction. Generally speaking, most of schools were constructed by international projects are safe from flood and windstorm. Even there was no great loss of schools from earthquake, flood, landslide and fires but to prevent and protect from unexpected damages come through disasters we do need to be prepared. In the past the losses were school roofs, structure of school and schools located in flood prone area. Therefore learning experiences from other countries will help Lao PDR to reduce the losses. There are two sources of such lessons from India and Bangladesh, which could be helpful namely an Earthquake preparedness Guide (India) and Safe schools in Uttar Pradesh and a Handbook on design and construction of housing for flood-prone rural areas of Bangladesh (Box 4).



Box 4: Example of safer design and construction guidelines
Earthquake preparedness Guide (India)
and Safe schools in Uttar Pradesh

The new design incorporated modifications in the configuration, construction material and use of reinforcing measures including:

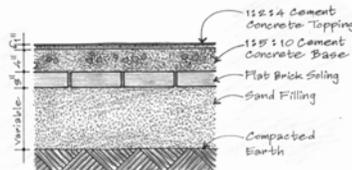
- Doors and windows were shifted at least 60 cms from vertical joints
- A steel rod was provided from the foundation to the slab at each vertical joint.
- Three horizontal bands with steel rods were made to run across the building walls at the plinth, sill and lintel levels to bind the structure
- Jambs were provided at each door & window from sill band to lintel band



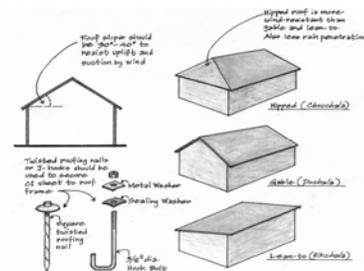
- Ratio of cement in the RCC foundation and slab was increased. Mixture of cement, sand and stone blast in the proportion of 1:4:8 was provided instead of 1:5:10 used earlier in the foundation. In the slab the proportion was changed to 1:1.5:3 in place of 1:2:4 used earlier

Handbook on design and construction of housing for flood-prone rural areas of Bangladesh

This hand book try to provide the options for safety housing in flood prone area, an **appropriate construction options** can be lesson learn for school construction in Lao PDR as:



- Plinth: 1. Cement stabilization (Mixture of earth and cement), 2. Brick Perimeter wall: (around
- The typical earthen plinth resists erosion from the side), 3. Brick and concrete
- Posts: coating lower end, concrete stump, reinforced concrete



- Roof: Chemical treatment of thatch, wind resistant roofing, rain water gutter
- Wall: protection against rain water plashing and flood, chemical treatment of bamboo mat wall, cross bracing, strengthening earthen wall

3.3 School construction process

Lao PDR has many models of primary school buildings: permanent, semi-permanent and temporary buildings. Their designs vary upon to the location, climate and donors, based on the experience with number of projects it is mention that the design should be simple, easy to build and maintain by local, cheaper and suitable to financial, economic and socio-cultural conditions of the country. There is not a common design for all country; only the district and villages know very well which design should be appropriate. At the practice, the availability of local material and labor, the contributions of the community and accessibility to the road determine the model of school buildings. During the construction phase it is really need to have local villager

involving in the process either contribute in cash, material, labor and in kinds or own the project by themselves.

The construction process of school of many projects is little bit difference from each other but however, it can be summarized as follows:

A. Selection of contractor

Local contractors are priority for school construction. However, contractor should have some knowledge's, experience, capital funds, number of engineers and construction equipment owned, in order to compare their management, execution and materials procurement abilities.

B. Quality of construction

All projects had provided their owned site engineer to supervise contractor in order to control a quality of construction. Therefore, the quality of construction is almost under control.

Chapter IV: Social and Economic Impacts of Disasters on Education Sector

4.1 Basic Statistics

There is no record or information about the number of students drop out during the disasters occurred in past. A report mentioned only some schools were closed about 2 to 3 weeks during the disasters occurred, some of the schools used temple hall for temporary use for classes but some of the schools could not make it because temple was also had daily activities for monk, teachers had nothing to do during flood.

Khammoune province is most affected by annual flood due to vulnerability location of province in disasters prone area, structural and non-structural measurement to disasters. Local authority is willing to work on disasters mitigation and prevention. Khammoune is also as priority area of government to reduce lost from disasters.

Box 5: What is school safety?

There are two broad areas of school safety: first of all, buildings are seismically safe and there is system in place to handle primary rush in case of an emergency. Secondly, building leadership and skill of the children, teachers and school management committees to save their own lives and handle emergency situations in community

Source: *School safety approach and the scaling-up strategy, Nepal 2007*

There is no documentation mention about the school location in prone area but due to the past disaster occurs to schools in 2002 to 2005, map no. 1 can indicate the schools in prone area due to flood occur in these school every year.

Box 6: Damage cost by disaster impact of Khammoune Province

District	Number of Schools
Thakhek	2
Mahaxai	32
Nongbok	21
Hinboun	18
Yommalat	
Boualapha	1
Nakai	
Xebangfai	13
Xaibouathong	

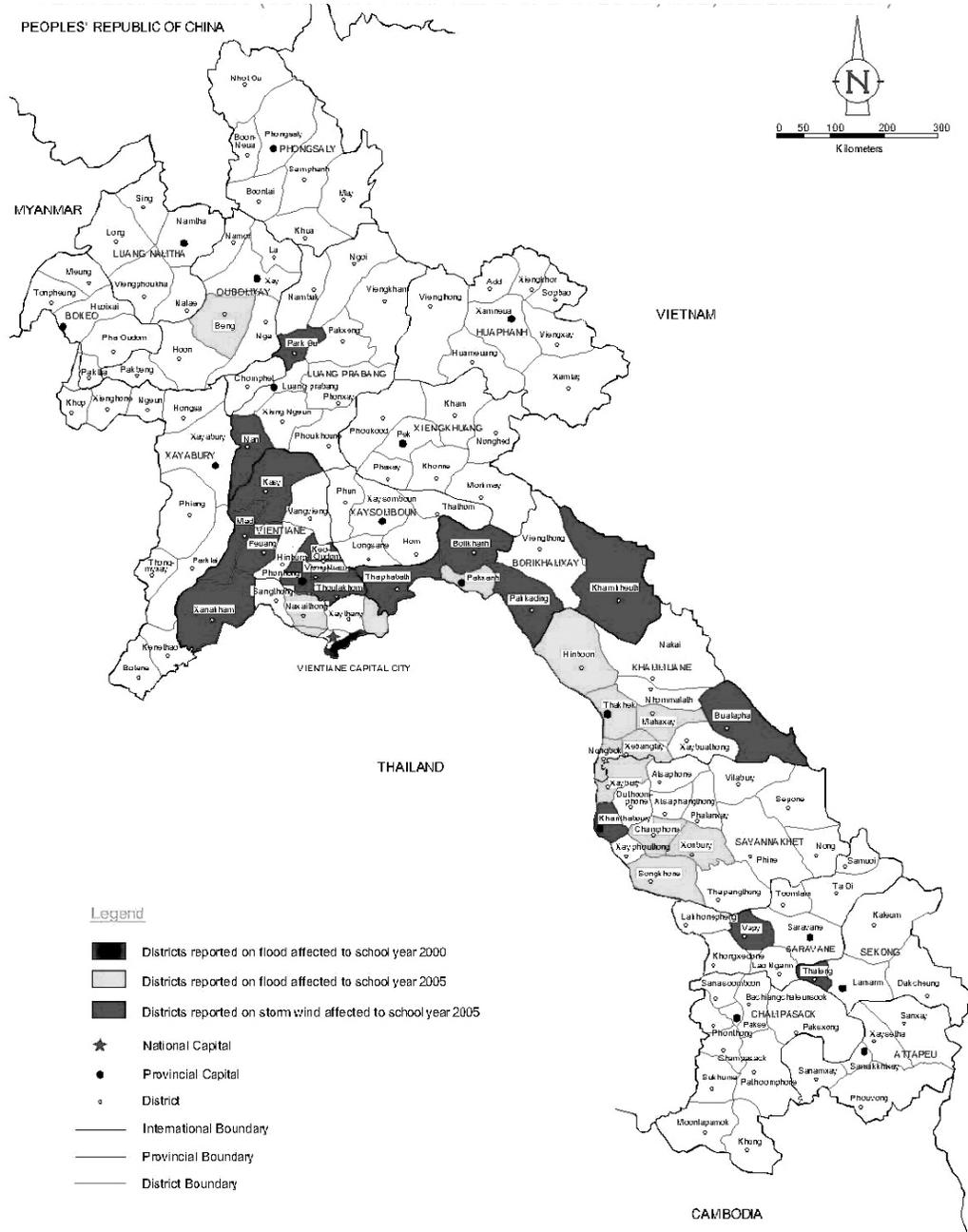
Source: *Annual Report of Disaster Management Khammoune Province*

LAO PDR: District reported on Flood and Storm Wind Affected to School Year 2000 and 2005 (Summary from Report on Flood, MoE, December 2007)



Map 1: School in flood prone areas

**LAO PDR: District reported on Flood and Storm Wind Affected to School
Year 2000 and 2005 (Summary from Report on Flood, MoE, December 2007)**



4.2 Impact of Disasters

Mr. Khamphai Sawady of Hoiuhai Primary Schools expresses his word by based on number of years experience in flood disaster of his place

“We are over 308 students and 14 teachers in this Hoiuhai Primary School which locate in flood prone area, every year we are staying with flood more that 2 to 3 weeks. Flood was damaged the structure of building, playground, textbook and others but most important students and teachers has to stop school while flood occurred. Both teachers and students have nothing to do only waiting for flood stop, but some years we can organize the school in community temple but due to temple also has daily activities for monks and community we can not organize class during the flood occurred . Not only classroom risk to disasters but it is also students and teachers are risk too because they are lack of awareness due to emergency safety and preparedness, pedagogy of school safety is not yet in the curriculum yet. We do need to have both safety structure and non-structure measures”

Table 14: Interview of the school principles affected by floods

Name of the School	Hoiuhai
Type of School (Primary/Secondary)	Primary
Location of the School (Name of the District & Province)	Soukhoumma, Champasak Province
Number of Student	308 Students (school year 2006-07)
Number of Teacher	14 Teachers
Number of School Building:	3 buildings
Type of School Building (building materials):	2 constructed by concrete, 1 construct by wood materials):
School building constructed by (MOE or others):	1 school funded by Poverty Alleviation Fund 1 school funded by central fund and community fund 1 school funded by community
Number of Classroom:	13 classrooms
Whether there is a playground in the school or not:	Yes
Is the School affected by Flood/cyclone Every Year? (yes/no)	Almost every year
If the School is affected by Flood/cyclone, how long it remains under water?	1-4 weeks
Is the School closed during flooding? (yes/no)	Yes
If the School is closed during flood, is there any alternative to continue the classes? (yes/no)	Yes, some of the class will open at temple

What type of damage is caused to the school building during most recent Disaster (flood/cyclone)?	Wall, roof, floor
Name of the School	Nonglom
Type of School (Primary/Secondary) :	Primary
Location of the School (Name of the District & Province):	Nongbok, Khammoune Province
Number of Student:	250 Students (school year 2006-07)
Number of Teacher:	7 Teachers
Number of School Building:	2 buildings
Type of School Building (building materials):	2 constructed by concrete, galvanized iron sheet for roof
School building constructed by (MOE or others):	2 schools funded by HCR project in 1978-79
Number of Classroom:	7 classrooms
Whether there is a playground in the school or not:	Yes
Is the School affected by Flood/cyclone Every Year? (yes/no)	Almost every year
If the School is affected by Flood/cyclone, how long it remains under water?	15-20-30 days
Is the School closed during flooding? (yes/no)	Yes, during September to October
If the School is closed during flood, is there any alternative to continue the classes? (yes/no)	Yes, no alternative
What type of damage is caused to the school building during most recent Disaster (flood/cyclone)?	Wall, roof, floor, blackboard, textbook
Name of the School	Bandone
Type of School (Primary/Secondary) :	Primary
Location of the School (Name of the District & Province):	Hatsaifong, Vientiane Capital
Number of Student:	50 Students (school year 2006-07)
Number of Teacher:	3 Teachers
Number of School Building:	1 buildings
Type of School Building (building materials):	1 constructed by concrete with galvanized iron sheet for roof

School building constructed by (MOE or others):	1 school funded by central fund
Number of Classroom:	4 classrooms
Whether there is a playground in the school or not:	Yes
Is the School affected by Flood/cyclone Every Year? (yes/no)	Almost every year because it locate near Mekong River
If the School is affected by Flood/cyclone, how long it remains under water?	3 weeks
Is the School closed during flooding? (yes/no)	Yes
If the School is closed during flood, is there any alternative to continue the classes? (yes/no)	Yes, no alternative
What type of damage is caused to the school building during most recent Disaster (flood/cyclone)?	Wall, roof, floor, textbook

Chapter V: Guidelines for School Construction

As in Lao PDR no Case studies directly involve to disaster prevention and protection therefore in this study will only explain criteria and guideline which provided by MOE

5.1 Guidelines to community on Participatory School Construction and Management (Education Development Project Phase II (EDP II))

Based on the Education for All (EFA) and National Plan of Action 2003-2015 therefore Lao Government implements the Education Development Project by receiving assistance from World Bank. EDP II has three components:

- a. increase rate of attend school and completed primary school within 19 poorest districts by contract to community for school construction and management
- b. Improving quality of teaching in primary school by editing the textbook and guideline for teacher
- c. strengthening and capacity building to policy analysis and administration to education sector

Guideline to community on Participatory School Construction and Management is one of the activities of the project. This guideline is aims to provide them an information and procedure of participatory for school construction and management.

Participatory Procedure to develop school

• Calculation for classroom need for construction

Head of Village (Naiban) has to prepare a student list and important information needed to calculate number of classroom and toilet for the new construction by following to the regulation of the project.

• Participation in school location and plan design

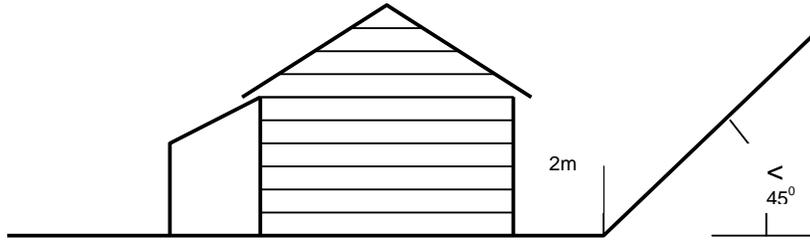
Village committee has to design for the construction location, Village has to clear and compensate to the land owner to avoid the problems after the construction. Village committee has to involve in the school plan: Site engineer will help village to design school plan and master plan in accordance to community preferable and safety for disasters.

• Master plan of new school

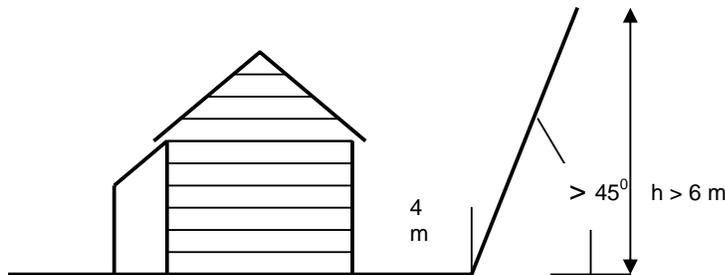
- The area of school must appropriate as: wide, not in flood prone area and safety to other disaster;
- Must have information about landslide of this location;
- Sun and wind direction;
- Water resource.

• **Step for designing of school master plan**

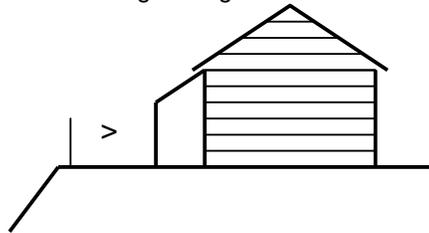
- Designation for each location, site engineer and village committee have to check the following items if it is included: Plan of school boundary, plan of existing building, plan of toilet, location of water resource, distance between building, play ground, direction arrow.
- General principle for drawing and construction plan:
 - Building must locate nearly at the back of land and the distance between building and fence should at least 2 meters;



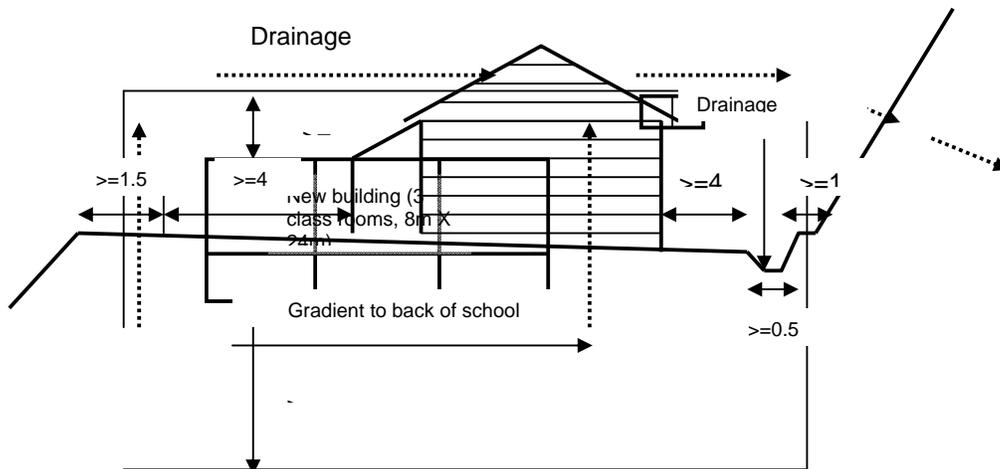
- If the slope of land more than 45 degree and high more that 6 meters, the distance should more than 4 meters;



- If cannot provide play ground in front because of limited of land, and then the building must give the set back from fence at least 4 meters;



- Toilet should far from water resource at least 30 meters;
- Toilet should locate at the back of school building;
- If water resource has to share with community, entrance should be provided in front near water resource;
- To protect the land erosion (school ground play), land surface should be gradient to the back and drainage system should be provided.



5.2 Criteria for Village selection and proposed models for school Construction and rehabilitation, Education Quality Improvement Project, Phase II (EQIP II) (Funded by ADB)

Criteria for village selection for school construction and rehabilitation

- A. The project will support (i) complete primary schools; (ii) building new primary schools; (iii) extending over-crowded schools; and (iv) giving matching grants to communities for building classrooms and rehabilitation of primary schools.
- B. The prior conditions for supporting construction activities are as follows:
 - The village/ community actively supports the proposed activities and is willing to help in the construction, operation and maintenance;
 - The sites are located in underserved and/or ethnic minority areas; and
 - In the cases of the completion of existing schools and the construction of new schools or classroom, sufficient number of teachers (qualified or unqualified) must be available either through the provincial education service or from the local community
- D. Priority will be given to completion of incomplete schools, as this is an area where one of the greatest increases in efficiency can be expect. Below are the criteria for inclusion of schools in the programs:
 - The schools are not currently operating up to grade 5;
 - The schools have viable numbers of students in its existing classes; and
 - There is no practical alternative school to which the children can transfer to complete their education, because of the reasons that other schools are too distant for children to transfer to (generally over 3 Km, but depending on local conditions and the age of the children) or that the alternative school is full and has no spare places
- D. The project will support the building of complete schools in villages where children currently have no practical access to primary education. Where appropriate, multi grade schools will be constructed. Target villages should meet the following criteria:
 - The village should have at least 50 children (6-10 years old) able to enter in the primary school or be situated in an area between villages where there are at least 100 children (6-10 years old); and
 - It should to be a long-term settlement.
- E. The project will support the building of additional classrooms in complete schools, when average class numbers are over 50 students per class. In the case where overcrowding at grades 1 and 2 is acute the project will support the construction of room that can be considered a day care center
- F. The project will support the use of at least 20 percent and not more than 40 percent of construction funds being allocated as matching grants to local communities, who wish to

renovate or extend their schools. The funds may also be used to construct simple day care facilities to shelter younger siblings to enable girls to attend school.

Proposed models for school construction and rehabilitation

Two options of flexible model are proposed as follows:

1. Village having access road

The medium standard of permanent building showed in the appendix 21 is appropriate; this mean the life span is more than 25 years. Their elements are:

- Floor: concrete
- Column: concrete
- Roof frame: hard wood
- Wall: plastered brick or limestone/ wooden plank and upon the existing durable local materials
- Roof materials: Fiber cement/ galvanized iron sheet
- Ceiling: plank wood/wooden plank/ woven bamboo
- Door and window: wooden plank/ply wood
- Toilet outside: permanent building (one unit per classroom)
- Water supply: well/ rural water pipe/ public water supply connection
- Electricity: public electricity connection if available
- Furniture: local fabrication
- Playground: the minimum size should have 10 times of covered building area
- Classroom size: in the main town: 7x 8 SQM/ in the country side: 6x7

Community contributions:

- Land acquisition and site cleaning
- Local materials (supply procedure)
- Water supply: build the well/pipe installation
- Fence implementation
- Provide labor to the contractor

2. Village does not have access road

The big problem for the construction is the materials transportation. For these cases we propose the semi permanent building with different standard and having life span more than 25 years for the main structure (Table 16).

Table 15: Standard Models for school construction

	Elements	Standard A	Standard B	Standard C
A	Floor	Cement plastered	Cement plastered/soil compacted	Cement plastered/soil compacted
B	Column	Concrete/hard wood	hard wood	hard wood
C	Roof frame	hard wood	hard wood	hard wood
D	Door	Wooden plank	Simple wooden plank	Simple wooden plank
E	Window	n.a	n.a	n.a
F	Wall (1.5 M high)	Brick/mud plastered/soft wooden plank/ woven bamboo	Mud plastered/soft wooden plank/ woven bamboo	Mud plastered/soft wooden plank/ woven bamboo
G	Ceiling	Woven bamboo	Woven bamboo	Woven bamboo
H	Roof Materials	Galvanized iron sheets	Galvanized iron sheets	Galvanized iron sheets*
I	Classroom size	6x7 SQM	5x6 SQM	4x5 SQM
J	Toilet	Rural standard, 1 unit per classroom	Rural standard, 1 unit per classroom	Rural standard, 1 unit per classroom

K	Water supply and cistern	Well/rural water pipe	Well/rural water pipe	Well/rural water pipe
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Notes:

Standard A: Big village having more than 50 household

Standard B: Medium village having 20 to 50 household

Standard C: Small village having less than 25 household

* 10% are transparent plastic sheets for getting the light

Community contributions:

- Land acquisition and site cleaning
- Local materials (supply procedure)
- Water supply: build the well/pipe installation
- Fence implementation
- Provide labor to the contractor

5.3 The Project for construction of primary schools in Lao PDR by JICA

A. Criteria for the selection of schools/sites covered by the Project agreed with Lao PDR are as follows:

1. Urgent needs estimates for additional classrooms due to classroom shortage;
2. Necessary number of classrooms at present and in future can be confirmed by population growth rate, number of school aged-children, enrollment ratio and other relevant data;
3. Sufficient teachers, budget allocation, and necessary cooperation from local residents in order to operate and maintain the facilities properly;
4. Topographical appropriateness and sufficient size of land to construct the facilities;
5. Legally confirmed ownership of land to construct and site the facilities;
6. Proper access roads in order to transport construction materials and equipment to respective sites;
7. Timely demolition and removal of existing facilities if required.
8. Temporary classrooms during the construction period can be prepared if the demolition of existing classroom is required.
9. No other program or plan of new classroom construction by other donors, NGOs and so forth in the Project's site;
10. No security problem and threat of natural calamity to endanger the smooth implementation of the Project.

B. Natural Condition

1) Consideration for sunlight and natural ventilation

To avoid the direct strong sun light, schools' longitudinal side will be placed along East-West axis. As the monthly mean of daily maximum temperature exceeds 30 °C and humidity in the rainy seasons (from May to September) is very high, consideration of natural ventilation must be given for planning of the facilities and the size of the window and eaves for natural light and protection from storm rain intrusion.

2) Consideration for wind and earthquake

For the design of the one-storied primary school structures in Lao PDR, it is a usual practice that wind force and earthquake force are neglected. There are no records of earthquake in the project area, which is Vientiane Capital and Vientiane province therefore earthquake force will not be considered in structure design. However wind force will be considered for structural planning, taken as 20m/sec, based on the recorded data of past monsoons.

3) Soil bearing capacity

The stratum for Vientiane Capital and Vientiane Province consists of gravel and clay layers overlaid by red colored late rite soil. Local structural design practice does not take into

account out detailed soil bearing capacity for small scale one storied primary school. Thus, the school is designed based on the soil bearing capacity of 5 ton/m².

C. Test Construction

Trail construction was implemented as part of the basic study to weigh three construction methods, a Block method (BL method), a Reinforced Concrete method (RC method), and a Pre-cast Concrete method (PC method) and identify construction abilities of local contractors. It was found that (1) an improved PC method would be structurally identical to the RC method and (2) both of the improved PC method and BL method did not present quality issue while having the same cost on the basis of total operating expenses. Therefore, it was determined that which method to be selected would be left to the discretion of tender in order to boost price competitiveness among those three methods. In addition, it was revealed that if construction works by local contractors were controlled under the proper supervision of a consultant, local contractor could be fully unitized for implementation of this project. So, it was determined that this project would be intended to avoid excessive grade setting, basically adopt a local standard design and develop a work execution plan under which local contractors familiar with school construction on the standard design would be fully used.

D. Quality

PC method is generally used as construction method and if rigidity has improved, there is no problem in quality control. Although BL method is not generally used for the school, it is easily constructed and has no problem for quality if the structure strength of concrete block is appropriately controlled.

Table 16: Comparisons of WB standard specification method and RC/PC method in this project

	WB standard	This project	Reason for usage
Main structure, column and beam	RC structure	Reinforced concrete / Pre-cast reinforced concrete	Local standard spec
	RC structure (wood beam)	RC structure	Local standard spec
Foundation structure	Independent foundation	Independent foundation	Local standard spec
Exterior wall	Brick wall	Brick wall	Local standard spec
Roofing structure	RC structure (wood beam)	Steel truss	Assure construction precision and reduction of construction period
Floor	Slab on grade	Slab on grade	Local standard spec

Table 17: Comparisons of the method by Grass root grant aid and BL method in this project

	Grass root grant aid	This project	Reason for usage
Main structure, column and beam	CB structure	CB structure (reinforced corner by RC)	Structurally reinforced
	none	RC structure	Structurally reinforced
Foundation structure	Foundation (continuous)	Foundation (continuous)	Local standard spec
Exterior wall	Concrete block	Concrete block	Local standard spec
Roofing structure	Steel truss	Steel truss	Local standard spec
Floor	Slab on grade	Slab on grade	Local standard spec

Structural calculation will be done in Japanese design standard because, building construction code are not provided in Lao PDR. Locally available materials, which are not uniform in quality and strength, will be selected based on either JIS standard or similar to the

JIS standard.

Structural design conditions and material specifications are shown below:

- **Design conditions**

- a. Earthquake load : not considered (In accordance with WB design standard)
- b. Wind load : $V_0 = 20$ m/sec (In accordance with the record of strong wind)
- c. Bearing capacity of soil : 50 KN/m^2 (In accordance with WB design standard)

- **Material specifications**

- a. Concrete : JIS or equivalent ($f_c = 21 \text{ N/mm}^2$)
- b. Concrete block : JIS B class or equivalent ($f_c = 6 \text{ N/mm}^2$)
- c. Reinforcing bar : JIS SR235 or equivalent ($f_y = 235 \text{ N/mm}^2$)
- d. Steel frame : JIS SS400 or equivalent ($f_y = 295 \text{ N/mm}^2$)

E. Mechanical and electrical plan

There are almost no schools with electricity installed in the classrooms, except for a very few teachers' rooms. Actually, there are almost no schools providing double shift schooling or adult education, therefore night-time use of electricity is not expected. Electric works will not be planned in this project, considering very low electricity usage.

F. Classroom building

Roof of the classroom building is a gable and overhung roof as locally practiced. The shape and width of the opening such as window, etc. will be planned considering light, wind ventilation, etc.

G. Policy for operation and maintenance

Primary schools belong to the village in principle, and residents of village and persons in charge of school running have responsibility to operate and maintain the facilities. Specific budget is scarcely provided by MOE, PEO, or DOE. However, the system is not yet set up to instruct and monitor the maintenance of the school facilities under its jurisdiction. Therefore, the primary school facilities are practically maintenance by the villagers who contribute both money and labour.

School facilities are cleaned by the pupils at the time of attending and leaving, and at lunch break. Classrooms are cleaned by the pupils on duty once a week. The field and toilets are cleaned by those pupils who are not on duty for classroom cleaning. In the project, the instruction to maintain and clean the facilities and equipment will be included in the plan, considering the existing villagers' spontaneous system of facility maintenance.

Chapter VI : Case Study

Case study 1: Phiatwat Secondary School, Vientiane Lao PDR

History

Phiawat Secondary School was established in 1950s by Catholic Religion Organization. At that time, it was a modern and famous school in Vientiane and other towns in the country. It is located next to a Catholic Church in Phiawat village, Sisattanak District, Vientiane. After Lao People's Democratic Republic was established in 1975, Phiawat school had become a secondary school.



Present Situation

The school has border with 3 roads, smaller roads in the east and south having 6 meters width, good condition, asphalt road and good drainage system. In the north, it has border with the main road, which is 9 meters in width, good condition, two layers of asphalt road and also with concrete drainage system. And the west the school has border with a Catholic Church.

There are two gates: one in the south that has smaller entrance for motorcycles, bicycles and pedestrian and another in the east, which is the main gate of this school with 4 meters width. It is also used for motorcycles, bicycles, pedestrian and teacher's cars. Phiawat School has 5 buildings, among which three buildings have 3 stories and other two buildings are 2 stories. The master plan of the school was designed with a play ground in the middle of campus. Most of the buildings are constructed by concrete, brick wall and roofs with tiles. This school used to teach for both primary and secondary level student but now it is only used for lower and upper secondary level. The facilities of school include classroom, principle room, teachers' room, administrative office, library, toilets, parking place for motorcycles, bicycles, and car parking in the play ground.

During the fiscal year 2007-2008, the total number of students accounts 1,282 persons among which 675 are girls. In total 57 teachers are in this school out of which 33 are female. The total number of permanent staffs is 55. The ratio of teacher and students is 1/46. Like other schools in the country the teaching period starts on 1 September and close in June, the subjects and timetable of teaching are the same like others that follow the regulations and guidelines of MOE.

Past Experiences on Disaster

Fortunately, Phiawat Secondary School had not faced any disaster that occurred in the past. Moreover, the school has two convenient entrances and also it is based in the low density traffic area.

Box 7: Number of Students and teachers in Phiawat Secondary School in 2007-08

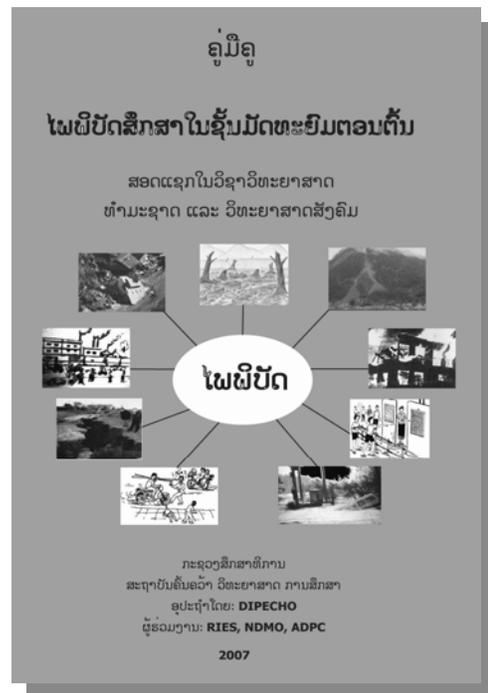
Number of Student			
Grade	Total	Girl	No. of Classroom
M1	166	77	3
M2	151	83	3
M3	144	71	3
M4	297	157	7
M5	245	135	6
M6	279	152	6
Number of Teacher			
Bachelor	37	18	
High Edu.	9	6	
	11	9	

Source: Phiawat Secondary School, 2007

The roads are strong enough for disasters responses such as faster evacuation, reaching the fire fighting vehicles. However, the buildings are very old and having one access (staircase) only for each building which is dangerous for fire preparedness.

According to the principle “the electricity system is now quite safe but only some part is vulnerable to fire such as main switches, etc.

Good Practice of Disaster Risk Reduction



Phiawat Secondary School is one of three schools selected to test the DRR (Disaster Risk Reduction) Module into the existing natural and social science subjects. The objective of that module is to make students aware and understand the causes and effects of disasters on lives and property in general, and understand the prevention methods and mitigation measures from disasters. This will help them to be ready to cope with the disasters which may occurred in the future and to help the community in the planning for disaster prevention and mitigation measures. The module is composed of nine chapters focusing on disasters such as landslide, flood, drought, earthquake, fire, pollution, road accident and social violence.

Disaster modules are taught in 3 classrooms at secondary level 1 (M1), which included 166 students and among which 77 were girls.

An evaluation of testing the integration of DRR module for one semester teaching had been conducted; the summary results are as follows:

For students: Most of students are able to understand the subject. The evaluation result shows good scores in the monthly and quarter examination. Students were very interested and enthusiastic during the lessons; many students raised the example from their home and experiences.

For teachers: Most of the teachers have had limited experiences and knowledge about disasters; mostly teaching was the only way following text books. To raise any example from their knowledge was still limited. Therefore teachers need to have more experiences on subject therefore it is needed to train those teachers who had been involve. It is necessary to have more visualizing materials for teaching such as color posters, video and others.

Chapter VII: Recommendations

Since this study is only an initiative on basic information of disaster impacts to education sector in Lao PDR, therefore the recommendations of this study are made based on the findings, gaps and the future needs. The recommendations in terms of structural and non-structural measures, in depth future study for education sector at different levels and others are presented below:

- Further and detail **Study on schools location in disasters prone area** (flood, fire, and earthquake) should be done. To know the location of schools is most important for flood safety due to flood hazards is most serious occurred in Lao PDR. It is need to know the flood prone area in order to avoid the affect from flood during the plan, new construction for school and protect existing school.
- As Lao PDR does not have **Building Code** for building construction yet therefore it is need to propose to Ministry of Public Works and Transport develop the Building Code with integrate of DRR. Ministry of Education shall develop a **Specific School Regulation Construction** by concerning to disasters (flood, fire, and earthquake) prevention and protection.
- **National Guideline for School Design and construction** should be made by Ministry of Education mainly to protect/prevent disasters and avoid overlapping and shortage of school construction procedures. An earthquake preparedness guide of India can be a lesson for earthquake mitigation even through Laos does not have much experience from this disaster. Handbook on Design and construction of housing for flood-prone rural areas of Bangladesh is also a good example that MOE can develop similar guideline.
- As a problems of this study is lack of information needed due to no systematic data record therefore the **regular official reporting and properly record systems** on school effected to disasters should be develop for better record of affected schools, students and teachers and understanding of school vulnerability.
- **Regular Monitoring systems for schools** affected from Disasters have to set up for Mitigation and Preparedness plan Develop the **planning capacity building** of the sector.
- Train technical staff in charge of maintenance, as well as the educational community, on natural hazard information management.
- **Disasters Subject** should be add into curriculum for all schools level with different level of education
 - ❖ Integration of DRR in the **primary school curriculum**. The primary Chapters are the most important to deliver the message of DRR to the students. Students in the primary classes are the most vulnerable to disasters. Of significance is the fact that in developing countries there is a high drop out rate after primary school. If DRR is not taught at the primary level than a substantial number of potential targets are missed. In addition, an important aspect is that the curriculum development cycle in Cambodia and Lao PDR is in process of review currently. In the Philippines the curriculum development cycle starts next year. This is the best time to make additions of topics on DRR in the curriculum, for all classes.
 - ❖ Integration of DRR in the senior **secondary school curriculum**.
 - ❖ Integration of DRR in the **university curriculum**, especially in the curriculum for courses in architecture and engineering.
 - ❖ Development of **curriculum for students and teachers with disabilities**, especially for those who are visually, hearing impaired and mentally challenged. This is a major gap. Some work has been done in Indonesia, but there are glaring deficiencies in other countries.

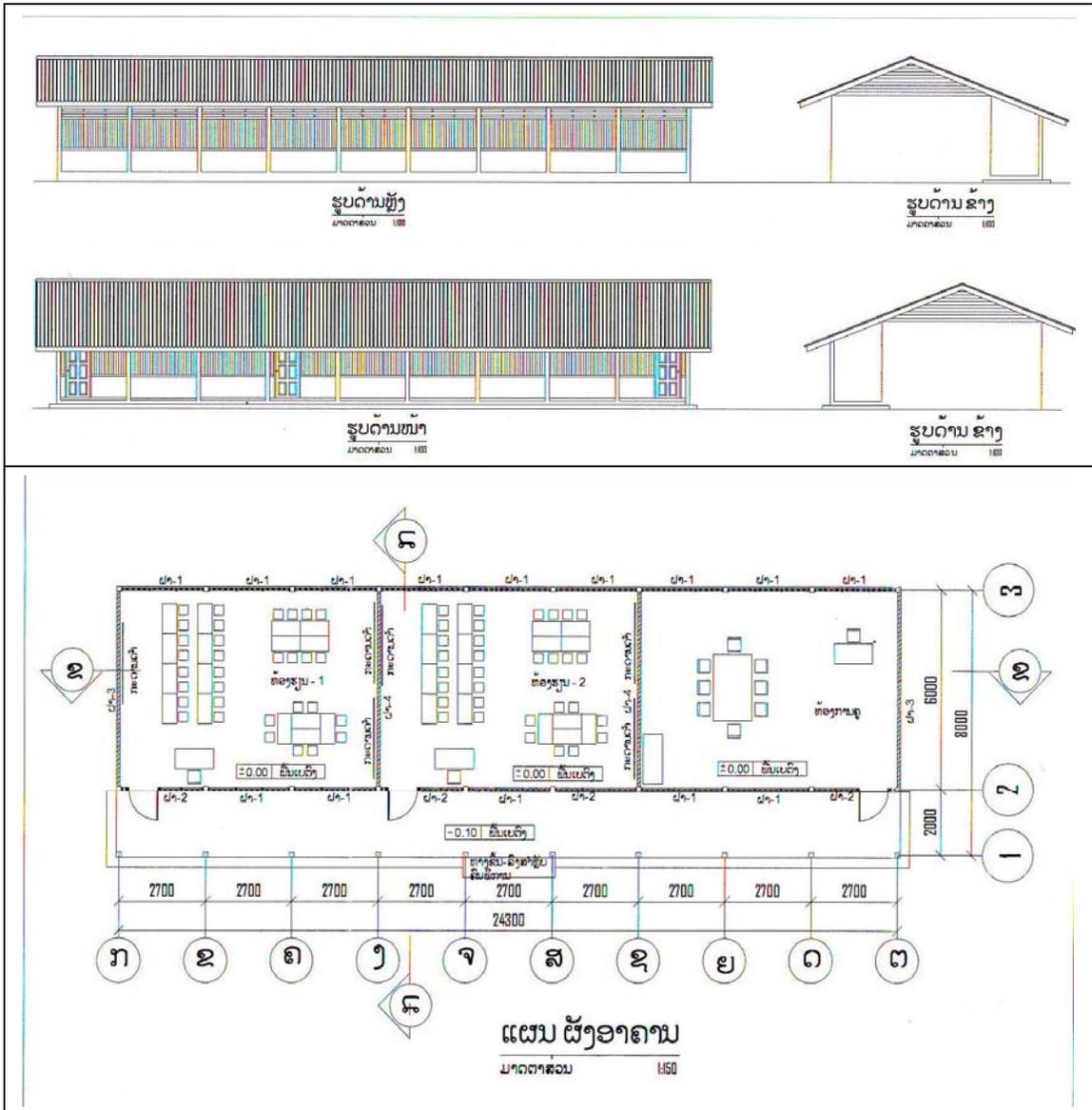
- Development of ***extra curricular activities for students*** which complement the DRR curriculum e.g. games (board and CD), quizzes, etc. The need for such activities has been expressed by teachers, education department officials and the NDMOs of the three countries.
- Development of ***training modules*** which can be used at teacher training institutes to teach the DRR curriculum to the teachers. This will also involve capacity building of the teachers training institutes and development of master trainers and resource persons who can teach other teachers. The modules are needed for newly appointed teachers as well as in service teachers.
- Development of ***guidelines for emergency planning*** in the schools. This would help complement the teaching of DRR in the schools. This will also require a training module for teachers on school emergency planning and capacity development of the teachers training institutes for this topic.
- The ***structural measures*** that need to be addressed by future programs and/or projects include:
 - ❖ Development of guidelines for the construction of safe school buildings.
 - ❖ Development of training modules and capacity development of training institutes for training in safe construction practices which integrate DRR. The training modules will be for architects, engineers, masons and the community.
 - ❖ Development of guidelines for assessment of vulnerability of school buildings and retrofitting of the buildings based on the results of the assessment.
 - ❖ Guidelines for design of schools so the buildings can be used as emergency shelters.

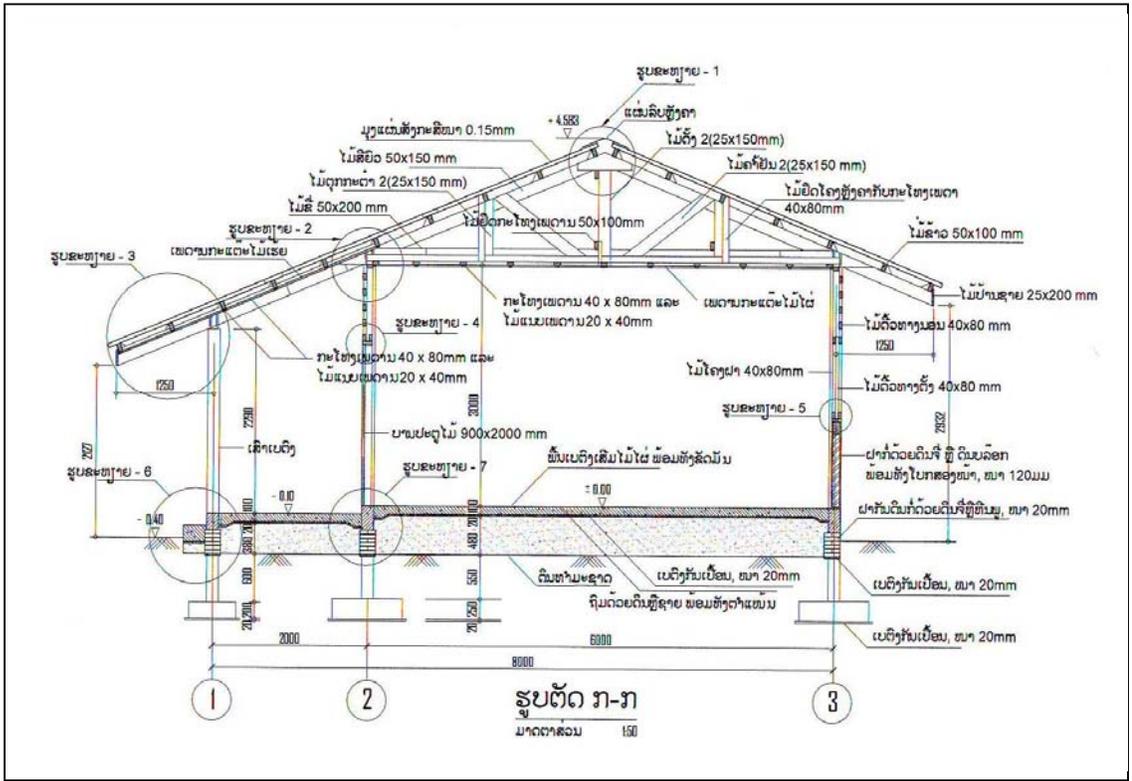
Annexes

Annex 1. School Building Designed by Projects

Annex 1.1 Education Development Project (EDP 2) (Supports by World Bank)

(Typical: 3 class rooms)

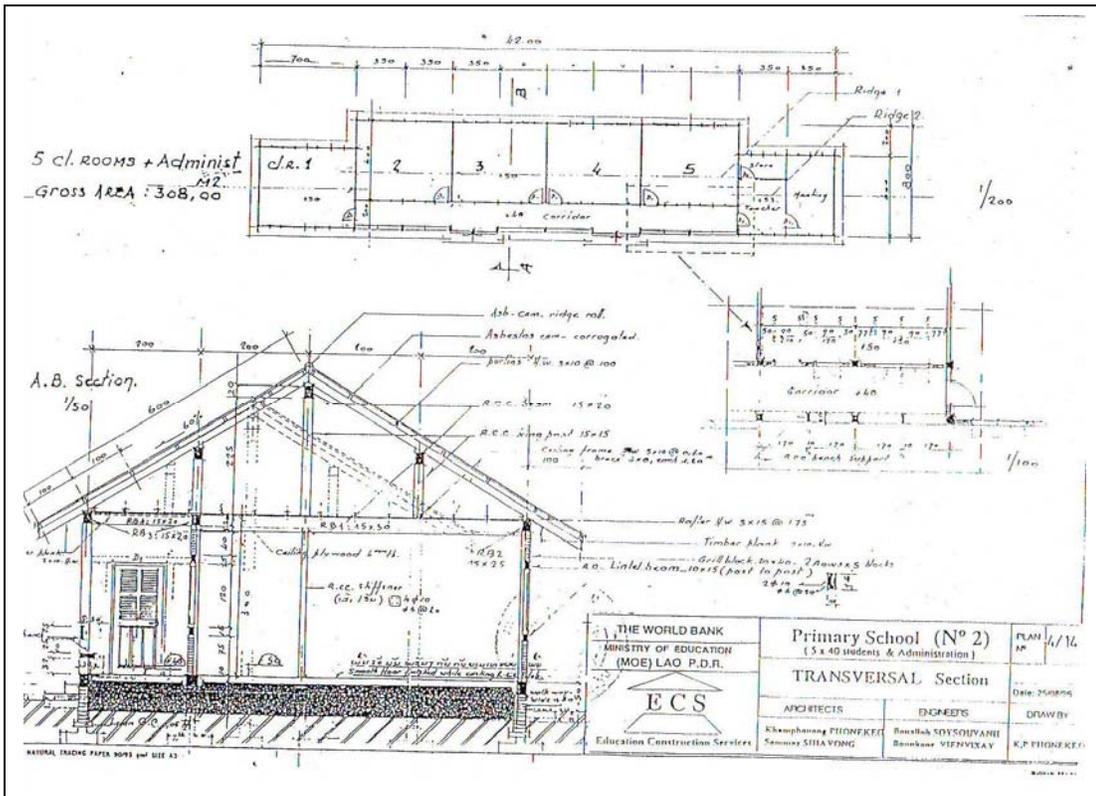
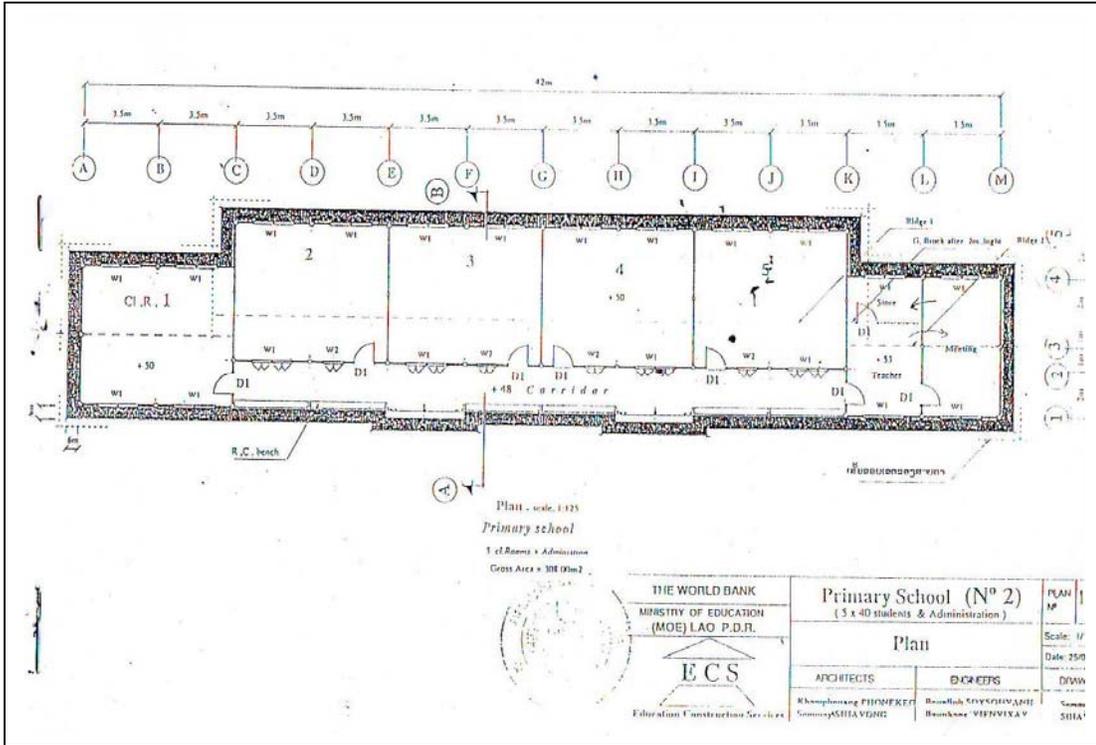




Front Elevation

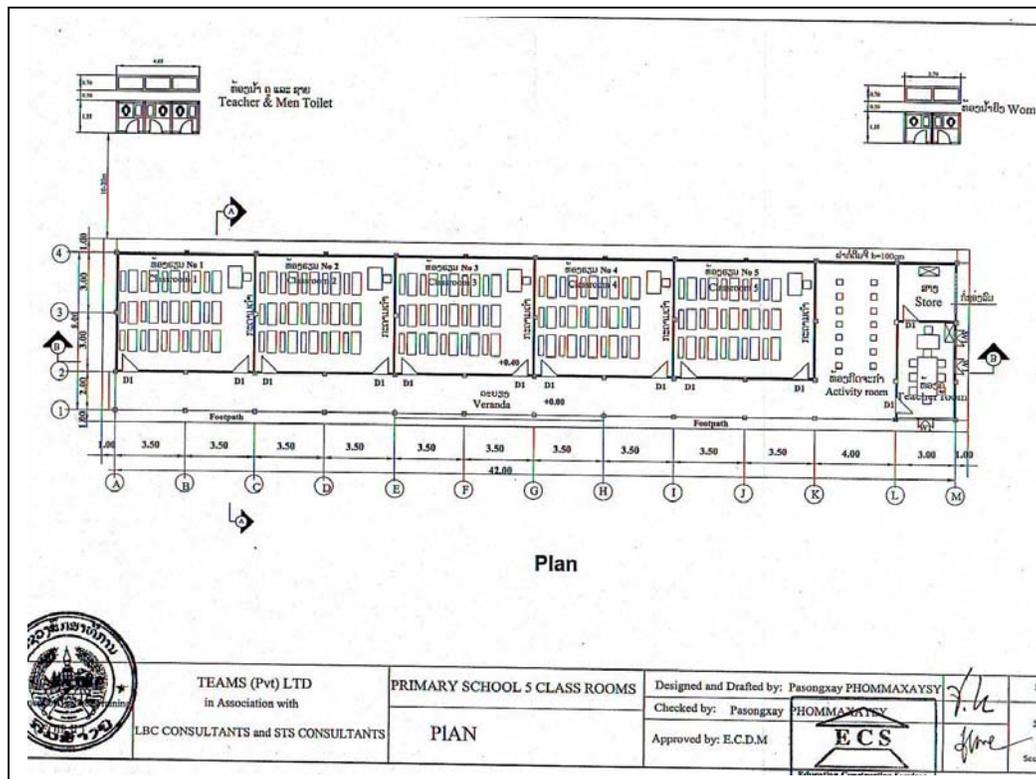
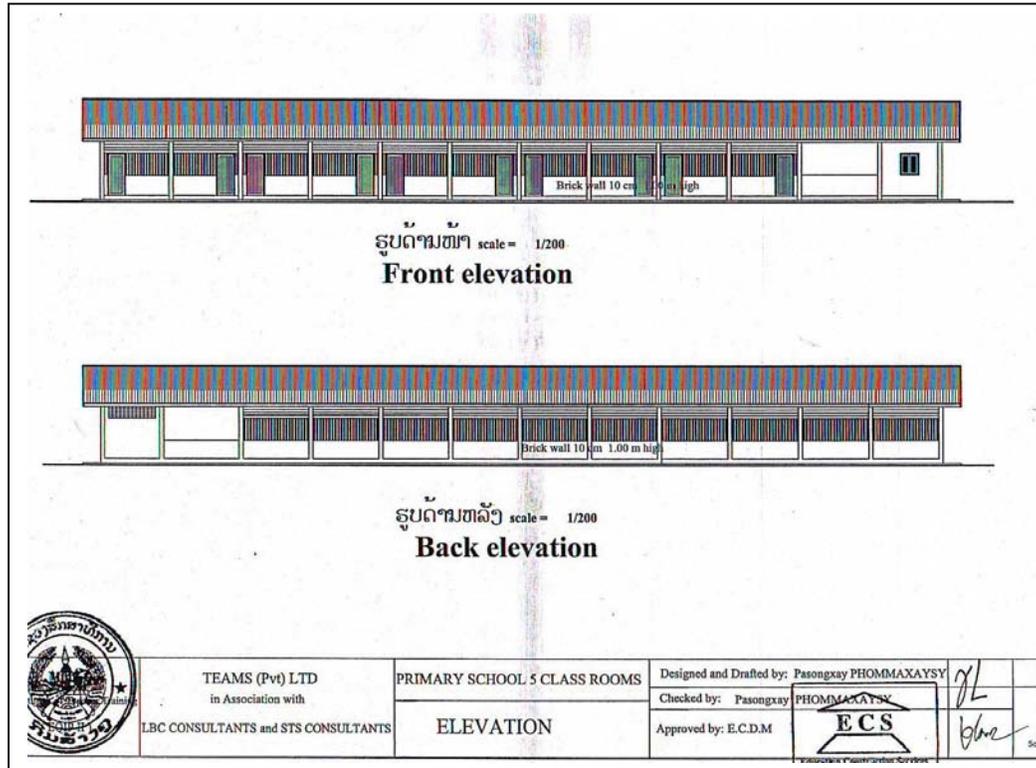
Back Elevation

THE WORLD BANK MINISTRY OF EDUCATION (MOE) LAO P.D.R. Education Construction Services	Primary School (N^o 2) (5 x 40 students & Administration) Front & Back Elevation	PLAN 2/1 Scale 1:125 Date 25/08/09 DRAWN BY SUMMAY SHAYVONG CHECKED BY BANHONG VIEPVIKAY SUMMAY SHAYVONG
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Annex 1.3 Education Quality Improvement Project (EQIP 2) (Supports by ADB)

(Typical: 5 class rooms)



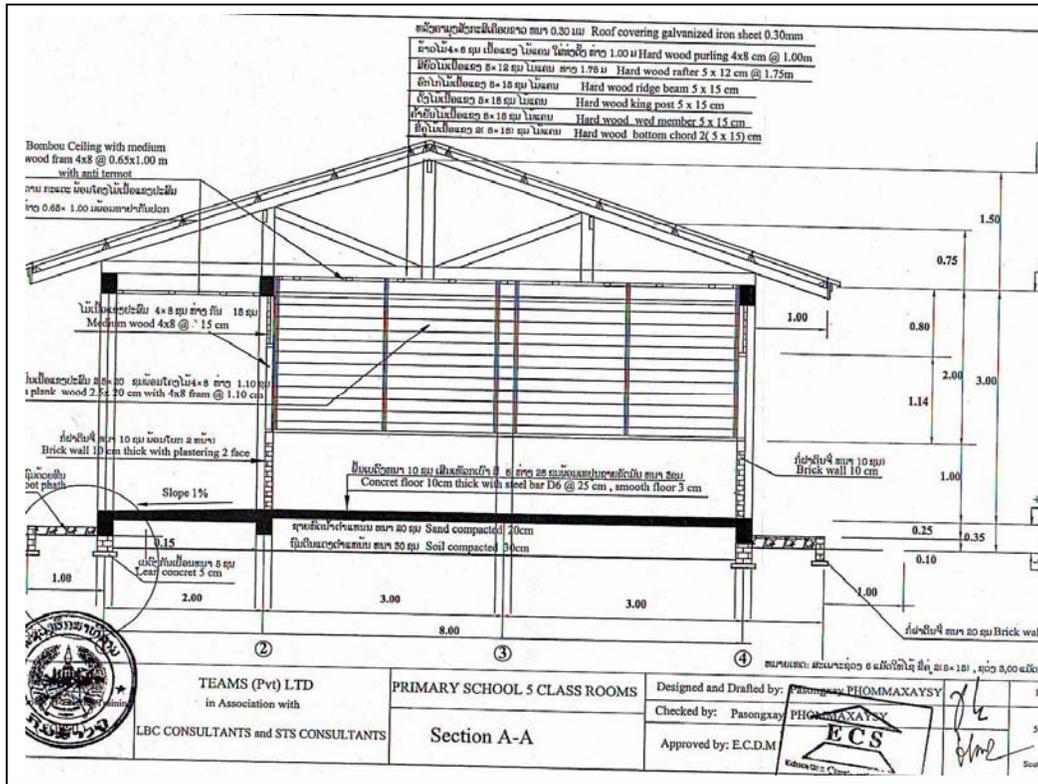


Table 18: Number of the primary schools, teachers, and student by province (2005-2006)

Provincial code	Provinces	Number of school	Number of teacher	Number of student
1	Vientiane Mun.	484	2,853	78,761
2	Phongsali	507	930	25,034
3	Louangnamtha	348	693	23,271
4	Oudomxai	466	1,075	49,834
5	Bokeo	262	781	23,973
6	Louangphabang	754	1,921	72,009
7	Houaphan	691	1,602	56,488
8	Xaignabouli	432	1,966	53,239
9	Xiengkhouang	448	1,538	48,733
10	Vientiane	512	2,534	69,269
11	Bolikhambxai	317	1,146	42,863
12	Khammouan	609	1,785	55,630
13	Savannakhet	1148	3,846	123,610
14	Salavan	533	1,234	49,726
15	Xekong	183	457	15,070
16	Champasak	766	2,186	85,835
17	Attapeu	191	599	18,536
	Total	8,651	27,776	891,881

Source: Ministry of Education 2007

Table 19: Number of the secondary and high schools, teachers, and student by province (2005-2006)

Provincial code	Provinces	Number of school	Number of teacher	Number of student
1	Vientiane Mun.	118	2,307	70,254
2	Phongsali	21	345	6,889
3	Louangnamtha	28	382	9,471
4	Oudomxai	36	464	13,386
5	Bokeo	27	333	9,254
6	Louangphabang	48	1,009	24,822
7	Houaphan	61	720	17,163
8	Xaignabouli	67	1,010	25,886
9	Xiengkhouang	49	856	23,883
10	Vientiane	93	1,670	39,313
11	Bolikhambxai	45	547	18,402
12	Khammouan	71	993	8,741
13	Savannakhet	146	2,103	14,998
14	Salavan	35	484	13,229
15	Xekong	10	176	4,090
16	Champasak	108	1,433	40,225
17	Attapeu	17	300	5,482
	Total	980	15,132	345,488

Source: Ministry of Education 2007

Table 20: Number of the kindergarten schools, teachers, and student by province (2005-2006)

Provincial code	Provinces	Number of school	Number of teacher	Number of student
1	Vientiane Capital	163	744	13,034
2	Phongsali	35	75	898
3	Louangnamtha	50	54	1,444
4	Oudomxai	27	85	1,429
5	Bokeo	49	69	1,458
6	Louangphabang	95	173	3,276
7	Houaphan	25	70	1,439
8	Xaignabouli	99	211	4,054
9	Xiengkhouang	18	56	1,093
10	Vientiane Province	99	251	3,863
11	Bolikhamxai	23	91	1,058
12	Khammouan	41	166	2,389
13	Savannakhet	192	450	7,708
14	Salavan	24	49	846
15	Xekong	8	31	389
16	Champasak	119	284	4,335
17	Attapeu	20	23	484
	Total	1,087	2,882	49,197

Source: Ministry of Education 2007

Table 21: Budget by class level (approved by National Assembly) (2001-2002)

Code	Education category	Administrative Fund		Investment Fund			Total	%
		Buy/Lease asset	Sub-Total	Domestic	Foreign	Sub-Total		
1	Kindergarten schools	0.00	109.43	0.00	0.00	0.00	109.43	0.02
2	Primary school	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	Secondary school	0.00	1,727.74	0.00	0.00	0.00	1,727.74	0.33
4	High school	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	Vocational school	0.00	4,530.09	0.00	0.00	0.00	4,530.09	0.87
6	Teaching school	0.00	7,848.87	0.00	0.00	0.00	7,848.87	1.51
7	University	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	Informal education	0.00	482.02	0.00	0.00	0.00	482.02	0.09
9	Administrative agency	0.00	272,539.45	65,751.80	165,133.93	230,885.73	503,425.18	97.16
	Total	0.00	287,237.60	65,751.80	165,133.93	230,885.73	518,123.33	100.00
							Government budget	4,035,000
							GDP	17,719,000
							Education (%) to GDP	2.92 %
							Education (%) to Government budget	12.84 %

Source: Ministry of Education 2007

Remark: Unit: Million kip
Investment fund covers:
Construction of school building
Maintenance/repair
Human resource development

Table 22: Budget by class level (approved by National Assembly) (2002-2003)

Code	Education category	Administrative Fund		Investment Fund			Total	%
		Buy/Lease asset	Sub-Total	Domestic	Foreign	Sub-Total		
1	kindergarten schools	0.00	102.22	383.00	635.00	1,018.00	1,120.22	0.24
2	Primary school	0.00	0.00	20,339.53	70,154.02	90,493.55	90,493.55	19.50
3	Secondary school	0.00	1,699.95	14,478.10	1,377.00	15,855.10	17,555.05	3.78
4	High school	0.00	0.00	9,255.90	6,398.96	15,654.86	15,654.86	3.37
5	Vocational school	0.00	4,667.11	8,483.24	19,478.75	27,961.99	32,629.10	7.03
6	Teaching school	0.00	7,738.22	3,543.94	69,589.74	73,133.68	80,871.90	17.42
7	University	0.00	0.00	5,850.00	16,740.57	22,590.57	22,590.57	4.87
8	Informal education	0.00	414.92	2,153.99	4,788.37	6,942.36	7,357.28	1.58
9	Administrative agency	0.00	160,450.87	13,660.33	21,802.08	35,462.41	195,913.28	42.21
	Total	0.00	175,073.30	78,148.03	210,964.49	289,112.52	464,185.82	100.00
							Government budget	4,700,000
							GDP	21,499,000
							Education (%) to GDP	2.16 %
							Education (%) to Government budget	9.88%

Source: Ministry of Education 2007

Remark: Unit: Million kip
 Investment fund covers:
 Construction of school building
 Maintenance/repair
 Human resource development

Table 23: Budget by class level (approved by National Assembly) (2003-2004)

Code	Education category	Administrative Fund		Investment Fund			Total	%
		Buy/Lease asset	Sub-Total	Domestic	Foreign	Sub-Total		
1	kindergarten schools	0.00	129.97	1,198.00	1,561.14	2,759.14	2,889.11	0.48
2	Primary school	0.00	0.00	21,457.93	84,084.25	105,542.18	105,542.18	17.66
3	Secondary school	0.00	2,285.10	2,887.00	1,508.00	3,945.00	6,230.10	1.04
4	High school	0.00	0.00	9,376.57	2,827.99	12,204.56	12,204.56	2.04
5	Vocational school	0.00	10,599.18	3,205.25	27,168.60	30,373.85	40,973.03	6.86
6	Teaching school	0.00	7,278.70	13,741.37	101,930.89	115,672.26	122,950.96	20.57
7	University	0.00	0.00	2,500.00	15,000.00	17,500.00	17,500.00	2.93
8	Informal education	0.00	0.00	621.53	6,931.65	7,553.18	7,553.18	1.26
9	Administrative agency	0.00	186,539.08	13,608.99	81,705.14	95,314.14	281,853.21	47.16
	Total	0.00	206,832.02	68,596.64	322,267.66	390,864.30	597,696.32	100.00
							Government budget	5,619,990
							GDP	24,621,000
							Education (%) to GDP	2.43 %
							Education (%) to Government budget	10.64%

Source: Ministry of Education 2007

Remark: Unit: Million kip
Investment fund covers:
Construction of school building
Maintenance/repair
Human resource development

Table 24: Budget by class level (approved by National Assembly) (2004-2005)

Code	Education category	Administrative Fund		Investment Fund			Total	%	
		Buy/Lease asset	Sub-Total	Domestic	Foreign	Sub-Total			
1	kindergarten schools	0.00	194.33	905.00	1,352.00	2,257.00	2,451.33	0.35	
2	Primary school	0.00	0.00	10,968.55	169,998.54	180,867.09	180,967.09	25.79	
3	Secondary school	0.00	2,593.36	819.03	21,656.80	22,475.83	25,069.19	3.57	
4	High school	0.00	0.00	3,797.11	3,426.34	7,223.45	7,223.45	1.03	
5	Vocational school	78.30	8,281.68	881.03	4,200.00	5,081.03	13,362.71	1.90	
6	Teaching school	49.10	13,313.78	4,125.50	74,304.22	78,429.72	91,743.50	13.08	
7	University	0.00	0.00	2,000.00	15,000.00	17,000.00	17,000.00	2.42	
8	Informal education	7.50	618.19	150.00	722.00	872.00	1,490.19	0.21	
9	Administrative agency	3,481.10	283,270.39	4208.97	74,863.38	79,072.35	362,342.74	51.64	
	Total	3,616.00	308,271.72	27,855.19	365,523.28	393,378.47	701,650.19	100.00	
							Government budget	6,007,000	
							GDP	28,076,000	
							Education (%) to GDP	2.50 %	
							Education (%) to Government budget	11.68%	

Source: Ministry of Education 2007

Remark: Unit: Million kip
 Investment fund covers:
 Construction of school building
 Maintenance/repair
 Human resource development

Table 25: Budget by class level (approved by National Assembly) (2005-2006)

Code	Education category	Administrative Fund		Investment Fund			Total	%
		Buy/Lease asset	Sub-Total	Domestic	Foreign	Sub-Total		
1	kindergarten schools	51.65	285.25	842.50	988.00	1,830.50	2,115.75	0.21
2	Primary school	0.00	0.00	6,941.12	162,636.13	169,577.25	169,577.25	16.88
3	Secondary school	142.00	2,570.73	3,913.32	27,594.55	31,507.87	34,078.60	3.39
4	High school	0.00	0.00	3,975.74	38,083.12	42,058.86	42,058.86	4.19
5	Vocational school	281.87	8,230.12	17,694.89	24,913.80	42,608.69	50,838.81	5.06
6	Teaching school	430.53	13,823.73	2,738.00	69,537.26	72,275.26	86,098.99	8.57
7	University	0.00	0.00	6,250.00	231,560.00	237,810.00	237,810.00	23.67
8	Informal education	74.50	924.31	256.24	4,935.00	5,191.24	6115.55	0.61
9	Administrative agency	1,288.45	332,228.80	5,254.78	38,624.20	43,878.89	376,107.78	37.43
	Total	2,269.00	358,062.94	47,866.59	598,872.06	646,738.65	1,004,801.59	100.00
							Government budget	7,390,000
							GDP	33,300,000
							Education (%) to GDP	3.02 %
							Education (%) to Government budget	13.60%

Source: Ministry of Education 2007

Remark: Unit: Million kip
Investment fund covers:
Construction of school building
Maintenance/repair
Human resource development

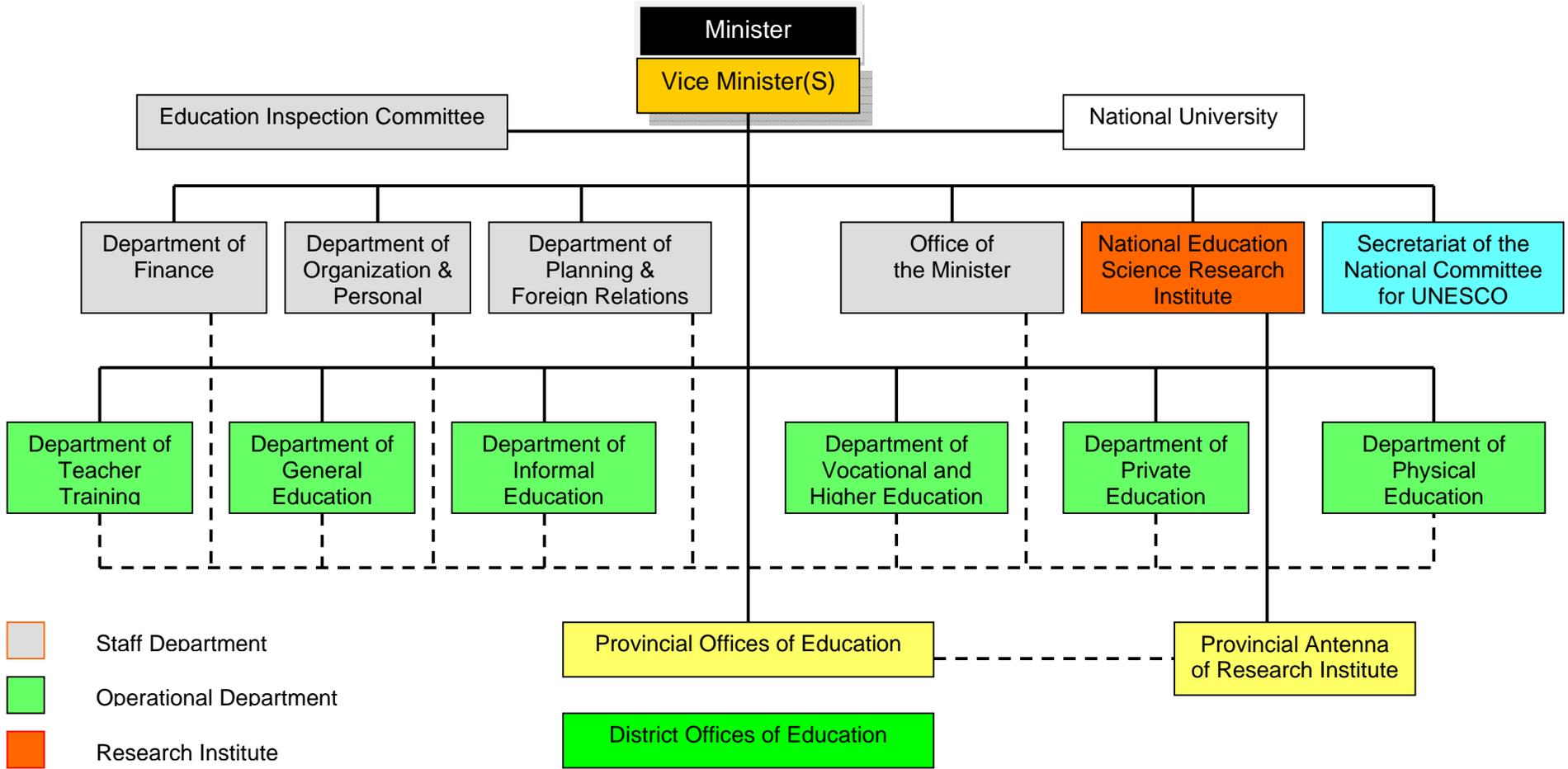
Table 26: Budget by class level (approved by National Assembly) (2002-2003)

Code	Education category	Administrative Fund		Investment Fund			Total	%
		Buy/Lease asset	Sub-Total	Domestic	Foreign	Sub-Total		
1	kindergarten schools	34.10	8,891.17	151.57	1,285.00	1,435.57	10,327.74	0.83
2	Primary school	110.15	140,912.20	8,283.69	255,394.71	263,678.40	404,590.60	32.59
3	Secondary school	0.00	53,450.21	5,086.75	59,718.49	64,805.24	118,255.45	9.52
4	High school	12.50	49,321.42	2,854.35	699.85	3,554.20	52,875.62	4.26
5	Vocational school	225.00	12,947.30	2,127.50	51,785.45	53,912.95	66,860.25	5.39
6	Teaching school	463.00	16,340.69	4,142.00	84,498.54	88,640.54	104,981.23	8.64
7	University	1,091.93	50,493.93	6,000.00	0.00	6,000.00	56,493.83	4.55
8	Informal education	54.00	4,074.55	80.00	3,937.00	4,017.00	8,091.55	0.65
9	Administrative agency	1,267.38	130,874.14	5,960.77	282,251.94	288,212.71	419,086.85	33.75
	Total	3,258.06	467,305.51	34,686.63	739,570.98	774,257.61	518,123.33	100.00
						Government budget	7,913.00	
						GDP	39,492.00	
						Education (%) to GDP	3.14	
						Education (%) to Government budget	15.69	

Source: Ministry of Education 2007

Remark: Unit: Million kip
 Investment fund covers:
 Construction of school building
 Maintenance/repair
 Human resource development

ORGANIZATION STRUCTURE OF MINISTRY OF EDUCATION



- Staff Department
- Operational Department
- Research Institute
- Special Purpose Agency
- General Department (Thabouang Organization)

- Line of authority
- Line of coordination, functional authorities

List of contact persons

No.	Name	Organization	Position	Telephone
1	Mrs. Keekong	Budgeting Division, Department of Finance, MOE	Deputy Director	21-222393
2	Mr. Khunh Xaysansvongxay	Primary Education Division, Department of General Education, MOE	Director	21-250946
3	Mrs. Yangxia Lee	Planning Division, Department of General Education, MOE	Director	21-612052
4	Mrs. Khamkuan Vanhnasouk	Project (EQIP II)	Deputy Director	21-243316
5	Mr. Daovone Sihuangxai	Project team (EDP II)	Consultant	20-5515976
6	Mr. Thiphamonn Chanthalangsy	Education Construction Service, Department of Finance, MOE	Head	21-213367
7	Mr. Phetsomphu	Education Office of Nongbok District	Head of Office	20-5074536
8	Mr. Ounkham Souksavanh	Save the Children Australia	Deputy Director Programs	21-263744
9	Mr. Ammone	Phiavat secondary school	Director	21-242786
10	Mr. Thongsavanh	Phivat secondary school	Teacher	20-5622488
11	Mr. Thai Phomasoulin	MOE, NDMC member	Coordinator	20-2245512
12	Mr. Sengkhom Komphakdy	NDMO, MOLSW	Technical Officer	20-2204093
13	Mr. Soulisack Simmanotay	Propaganda and Fire Prevention Division, Fire Prevention and Protection Department	Deputy Director	20-2211190
14	Mr. Anolack	JICA	Staff	021-241100
15	Miss. Manivone Souliyo	KOICA	Secretary	021-263332
16	Mr. Khamphiew Savatdi	Primary school HuaiHair	Director	20-5759957
17	Mr. Ketsana Viphongsay	Planning Unit, Hatsayfong District Education Office	Head	20-6658737

List of Donor Funded Projects in Education Sector in Lao PDR (ongoing and recent past)

No.	Project Name	Project Objective	Funding Agency	Loan/Funds Amount	Type of Fund	Project Duration	Execution Agency
1	Basic Education Sector Development Program	<p>The objective of the program grant is to support policy actions that contribute to (i) ensuring increased resource mobilization to the education sector including rationalizing budgetary allocations for education; (ii) the design and implementation of an outcome-oriented budgeting and financial management system that will also lead to preparation of a Medium Term Expenditure Framework (MTEF) for education; (iii) providing a more relevant and integrated curriculum for school education; (iv) strengthening teacher management through preparation of a recruitment and deployment plan and through development of a TMIS; and (v). strengthening capacity for decentralized planning These policy actions support expanded access, equity, and quality of education, and will also strengthen capacity of Ministry of Education and the provincial and district level bodies responsible for education administration for more effective decentralized planning, management, financial reporting and budgeting for the school sector.</p> <p>http://www.adb.org/Documents/PIDs/32312013.asp</p>	Asian Development Bank	US\$ 8.9 million	Asian Development Fund	20 Dec'06 to 30 Apr'10	MoE

No.	Project Name	Project Objective	Funding Agency	Loan/Funds Amount	Type of Fund	Project Duration	Execution Agency
2	Basic Education Development (Investment) - 32312-02	The objectives of the Project are to supplement the policy initiatives being supported under the Program and to enhance equitable access to, and quality of, lower secondary education through: (i) expansion of lower secondary education opportunities in 20 districts in 6 provinces (Attapeu, Bokeo, Champasack, Khammuane, Luang Namtha, and Savannakhet) to improve access and equity; (ii), the integration of basic education curriculum to account for LS expansion from 3 to 4 grades improved quality and relevance of LSE; and (iii) capacity building at central, provincial and district level in critical areas (EMIS, budgeting and financial management, and planning). http://www.adb.org/Documents/PIDs/32312022.asp	Asian Development Bank	US\$12.7 million	Asian Development Fund	20 Dec'06 to 30 Sep'12	MoE
3	Second Education Quality Improvement Project	The overall project objectives are (i) to improve the relevance, quality, and efficiency of primary and secondary education through developing a teacher training support system, enhancing the professional status and career development of teachers; (ii) to expand access to and improve retention in primary school especially of girls and ethnic children in the poor and underserved areas of the country; (iii) to strengthen the institutional capacity of central, provincial and district, and village level administration to plan and manage the decentralized education system.	Asian Development Bank	US\$20.0 million	Asian Development Fund	20 Sep'01 - 30 June'08	MoE

No.	Project Name	Project Objective	Funding Agency	Loan/Funds Amount	Type of Fund	Project Duration	Execution Agency
4	Sector-wide Approach in Education Sector Development	<p>The impact of the project will be strengthened capacity for education sector development. The project will accomplish this by assisting Ministry of Education to develop a sector wide framework for education by analyzing enrollment trends and the impact these will have on sector issues. The Project will assess the projected expansion of enrollments at the primary, lower and upper secondary level and the impact this expansion will have on the demand for physical facilities; teachers; textbooks and learning materials; institutional and management capacity at all levels of education management and delivery, and establish priorities to match resource availability. The project will result in a sector wide framework for developing the school sector based on projected enrollment expansion. The framework will cover a period of 10 years with in three phases- with each phase being self sufficient in terms of inputs necessary to support expansion of enrollments anticipated to occur during that phase. The framework will allow: (i) comprehensive projection of education sector resource requirements; (ii) coordinated and complementary external assistance; and (iii) more balanced sector development.</p>	Asian Development Bank	US\$500,000	Technical Assistance Special Fund	20 Dec'06 -	MoE

No.	Project Name	Project Objective	Funding Agency	Loan/Funds Amount	Type of Fund	Project Duration	Execution Agency
5	Basic Education (Girls) Project (formerly Women's Education)	Component 1 financed by ADB: Expand access and improve retention by providing primary schools and district education bureaus in 51 districts. Component 2 financed by AusAID: Improve the relevance, quality and efficiency of primary education by providing supplementary materials, recruiting and training ethnic teachers and supporting in-service training to teachers and school principals in multi-grade schools and schools in ethnic areas. Component 3 financed by ADB: Strengthen management system and capacity of government officers from central to local levels.	Asian Development Bank	US\$20.0 million	Asian Development Fund	25 Jan'95 - 31 July'07	MoE
6	Basic Education Development	The TA aims to help the Government to prepare the basic education development program (BEDP) so it can start in 2006. BEDP will support the sector reform toward EFA by 2015, which is unlikely to be accomplished in full and on time without the support of a policy-based lending component. Specifically, BEDP will be prepared as sector development program loan (SDP), a combination of an investment (project component) and policy reform (program) component, for implementing relevant portion of the EFA plan and the operational policies for decentralized education management. Preparation of BEDP as an SDP includes (i) sector study; (ii) policy dialogue; (iii) aid coordination; (iv) program design; and (v) project design. In summary, for a program component, the TA will identify the scope of the sector reform and level of support to the adjustment cost during the reform period from 2006 or 2007 for 3 years. For investment component, the TA will identify the	Asian Development Bank	US\$600,000	Japan Special Fund	2004 - 2006, Closed	MoE

No.	Project Name	Project Objective	Funding Agency	Loan/Funds Amount	Type of Fund	Project Duration	Execution Agency
		investment needs to strengthen primary and lower secondary education and decentralized education management for implementation over approximately 5 years. At the same time the TA will identify financing partners for each component. http://www.adb.org/Documents/PIDs/32312012.asp					
7	Women's Education	The objective of the TA is to prepare a detailed proposal for the Women's Education Project for consideration by the Government and the Bank.	Asian Development Bank	US\$380,000	Japan Special Fund	Start 1995-96, Closed	MoE
8	Second Education Quality Improvement Project	The Technical Assistance (TA) will prepare analytical background papers and a proposal for a second education quality improvement project for consideration by the Government and ADB. The TA will focus on (i) promoting equitable access to complete primary education for students in underserved areas, particularly for girls and ethnic minority groups; (ii) improving the quality of primary and secondary education through support to teacher development and teacher training systems; (iii) strengthening MOE's capacity to manage, plan, and monitor teacher development and teacher training systems; and (iv) helping to formulate and implement financing policies and targets to ensure satisfactory education sector development. The Project will contribute to poverty reduction by strengthening quality and equity of basic education, thus providing the poor with the opportunity to improve their economic status and to increase their participation both in the workforce and in society at large.	Asian Development Bank	US\$600,000	Japan Special Fund	Start 1999, Closed	MoE

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About this Study

The study is one of the four activities developed under the Advocacy and pilot implementation project in Education Sector in South East Asia - Support to Implementation of Hyogo Framework for Action through Mainstreaming of Disaster Risk Reduction into Development (MDRD) program of the Regional Consultative Committee on Disaster Management (RCC).

The project is being implemented in Cambodia, Lao PDR and the Philippines by National Disaster Management Offices and the Ministries of Education in partnership with DIPECHO, UNDP, and ADPC. The project includes the following activities:

1. Initiating Mainstreaming Disaster Risk Reduction into Secondary School Curriculum,
2. Study on Impacts of Disasters on Education Sector,
3. National Advocacy Workshops on Mainstreaming Disaster Risk Reduction into Education Sector, and
4. Stakeholder consultation as a follow-up to the advocacy national workshops.

The objective is to build an evidence-based rationale to raise awareness on integrating disaster risk reduction concerns into education policies and to advocate for changing practices in school construction and incorporating disaster risk resilient features in new school construction.

