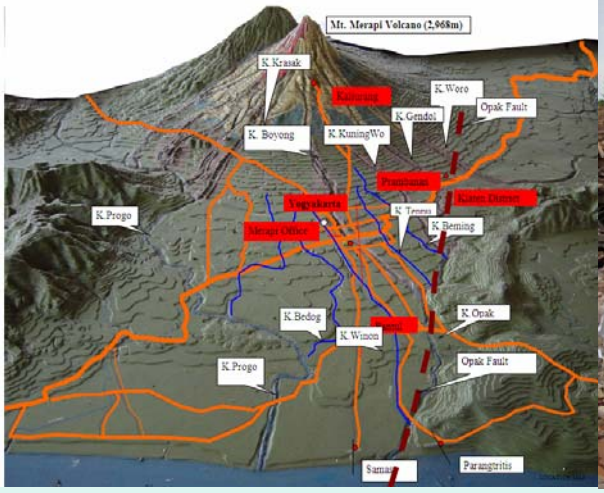
Republic of Indonesia

ACTION PLAN OF THE REHABILITATION AND RECONSTRUCTION FOR THE POST-EARTHQUAKE AFFECTED AREAS IN THE PROVINCE OF YOGYAKARTA AND THE PROVINCE OF CENTRAL JAVA



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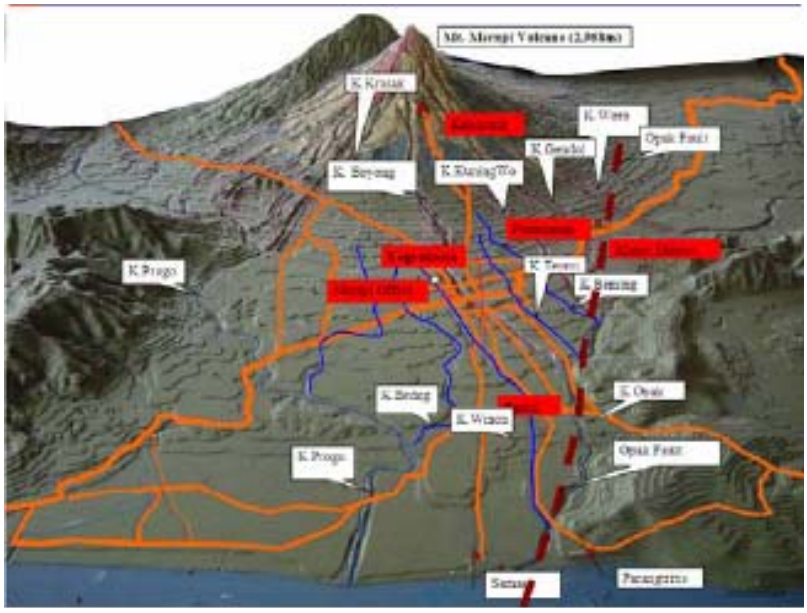
CHAPTER I
INTRODUCTION

I.1 BACKGROUND

Indonesia was once again hit by a natural disaster. Occurred on May 27, 2006 at 5.53 a.m., a 5.9 on Richter scale earthquake with its epicenter located just only 33 km below the surface, and with its coordinate on $8^{0}03'$ of South Latitude and $110^{0}23'$ of East Longitude struck Province of DI Yogyakarta and Province of Central Java. Just 35 km away from Yogyakarta, this earthquake trembled two aforesaid provinces and caused considerable damage. Two districts suffered most damage, which were the district of Bantul in Province of DI Yogyakarta and the district of Klaten in the province of DI Yogyakarta. These was the consequences of their location, which laid on the active Opak fault. This fault is crossing the areas, as long as 60 km, starting from Sanden to its end-point at Tulung, both in the district of Bantul in the province of DI Yogyakarta (see figure 1.1). Sanden is on the shore which happened to be the closest point from the epicenter.

Figure 1.1. Region along Opak Fault Stricken by Earthquake Impact



Source: Japan Bank for International Cooperation (JBIC)

Collected from various sources and later on designated as a database, the data showed that there were 5,760 people died as a victims. Latest update of the data from the National Coordinating Agency for Disaster Management (*Badan Koordinasi Nasional Penanggulangan Bencana dan Penanganan Pengungsi*) indicated that 126,133 unit of houses collapsed out of 583,593 unit of damaged houses.

This earthquake was the third worst calamity that Indonesia suffered within the last eighteen months. In December 2004, the big earthquake followed by Tsunami wave destructed most of Nanggroe Aceh Darussalam Province and Nias Island in North Sumatera Province. In March 2005, another earthquake shook back Nias Island.

Despite the low number of victims, the damages suffered by the affected areas from this disaster was quite massive. respectable international institutions has put this recent catastrophe as one of the worst natural disasters occurred within the last ten years (see table 1.1). Collaborative effort between Indonesia Government Agencies and International Experts assessed the damage and loss had reached 29.1 trillion rupiah or equivalent to USD 3.1 billion. This total figure exceeded the total loss suffered by Srilanka which was caused Tsunami; and almost equal to the earthquake effect occurred in Gujarat (India) and Pakistan in 2005.

Table 1.1. Comparison of Some International Disasters

Country	Type of Disaster	Occurrence	Victim	Damage and Loss (US$ Million)	Damage and Loss (million US$ of 2006 constant price)
Indonesia (Aceh)	Tsunami	26 Dec. 2004	165,708	4,450	4,747
Pakistan	Earthquake	08 Oct. 2005	73,338	2,900	2,992
Sri Lanka	Tsunami		35,399	1,454	1,551
India (Gujarat)	Earthquake	26 Jan. 2001	20,005	2,600	2,958
Turki	Earthquake	17 Aug. 1999	17,127	8,500	10,281
India	Tsunami	26 Dec. 2004	16,389	1,224	1,306
Honduras	Mitch Storm	25 Oct.–8 Nov. 1998	14,600	3,800	4,698
Thailand	Tsunami	26 Dec. 2004	8,345	2,198	2,345
Indonesia (Yogya-Central Java)	**Earthquake**	**27 May 2006**	**5,760**	**3,134**	**3,134**

Source: Asia Disaster Preparedness Center, Thailand; ECLAC, EM-DAT, World Bank, June 2006

The preliminary damage and loss assessment of earthquake impact in Yogyakarta and Central Java, conducted shortly after the struck, was adopting damage and loss assessment methodology which had been developed since 1970 by United Nations Organization's agency, namely *Economic Commission for Latin America and Caribean* (ECLAC). Led by National Development Planning Agency (Bappenas), related National Ministries/Institutions, Local Government offices of Yogyakarta and Central Java, and international donors communities conducted Damage and Loss assessment activities, while afterward the report was submitted to the President of the Republic of Indonesia on June 12, 2006, prior to CGI Meeting on June 14, 2006.

Based on the result of the damage and loss value calculation, it is known that only 11.3% (worth IDR 3.8 trillions) from the whole damages and losses are the public's property, while the balance is private or individual's property.

The Government of the Republic of Indonesia, D.I. Yogyakarta Province and Central Java Province together with the sympathized public groups either national or international have conducted the emergency relief efforts. Establishment of temporary

refugees relocation centers, logistic aid distribution, medical volunteer mobilization, and also fund collection have been conducted in order to help alleviating the anguish of the earthquake disaster victims.

In his visit to the area incurred the earthquake, the President of the Republic of Indonesia on the first occasion to deliver as special the following guidances:

1 Firstly, save the victim life, those who injured then property;

2 Repair the infrastructures, electric, and road in order that logistic can be distributed and for rescuing the victim;

3 Make sure the adequate food, well-coordinated;

4 Identify how many broken houses or buildings for being rehabilitated and reconstructed later.

Furthermore, emergency relief efforts are promptly followed up by the efforts of rehabilitation, and according to the guidance of the President of the Republic of Indonesia and the Vice President of the Republic of Indonesia, then reconstruction and rehabilitation program post-disaster focused on the following programs:

1. Settlement and housing rehabilitation;
2. Public infrastructure and means rehabilitation;
3. People and regional economic revitalization.

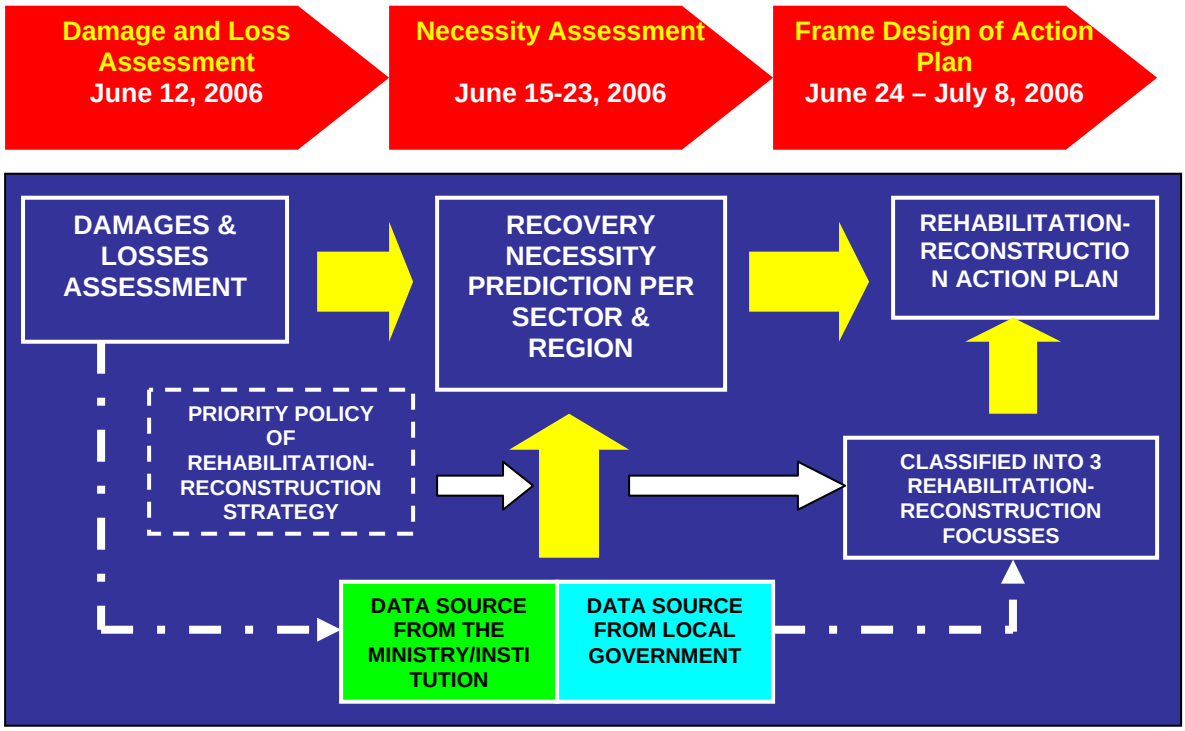
Those three programs above are crucial to do promptly because either central or regional government will only shoulder the public sector rehabilitation finance and provide a support to the private sector for being able to perform the rehabilitation.

The settlement and housing rehabilitation get a special attention as the most damage and loss in area incurred the disaster impact is home based-industry located at the people houses. Through the settlement and housing rehabilitation, this home industry will be expected to rise immediately too. Nevertheless, it remains to need the support of reconstruction and rehabilitation activity aimed at directing for the people economy recovery including equipment aid and working capital. In order to support this, then the public infrastructure and means rehabilitation will be significant for ensuring the local economy that can be risen back soon.

The implementation of the reconstruction and rehabilitation in area incurred calamity impact in D.I. Yogyakarta Province and Central Java Province, needs the completed and integrated plan. According to an agreement between the central and regional government, a book of action plan will be used as an implementation guidance of the rehabilitation and reconstruction in area incurred calamity impact in D.I. Yogyakarta Province and Central Java Province.

This book of action plan arranged through a planning process made by the regional government at both provinces, namely D.I. Yogyakarta Province and Central Java Province. The role of Central government in the process of action plan arrangement is as a Coordinator and Facilitator, while the role of regional government is as a detailed action plan arranger for rehabilitation and construction afterward will be a prominent reference in the implementation at field level. the process and mechanism of the Action Plan arrangement can be seen in the following Diagram 1.1.

Diagram 1.1. Arrangement Flowchart of Rehabilitation and Reconstruction Action Plan



Source: Bappenas, June 27, 2006

As the coordinator of Action Plan arrangement, Bappenas gets input from the minister/institute, State-Owned Corporation and also from related donor countries/agencies. Furthermore, Bappenas together with the Regional Development Planning Agency (Bappeda) of D.I. Yogyakarta Province and the Regional Development Planning Agency (Bappeda) of Central Java Province are doing consultation, consolidation and coordination in order to determine activity components for further rehabilitation and reconstruction.

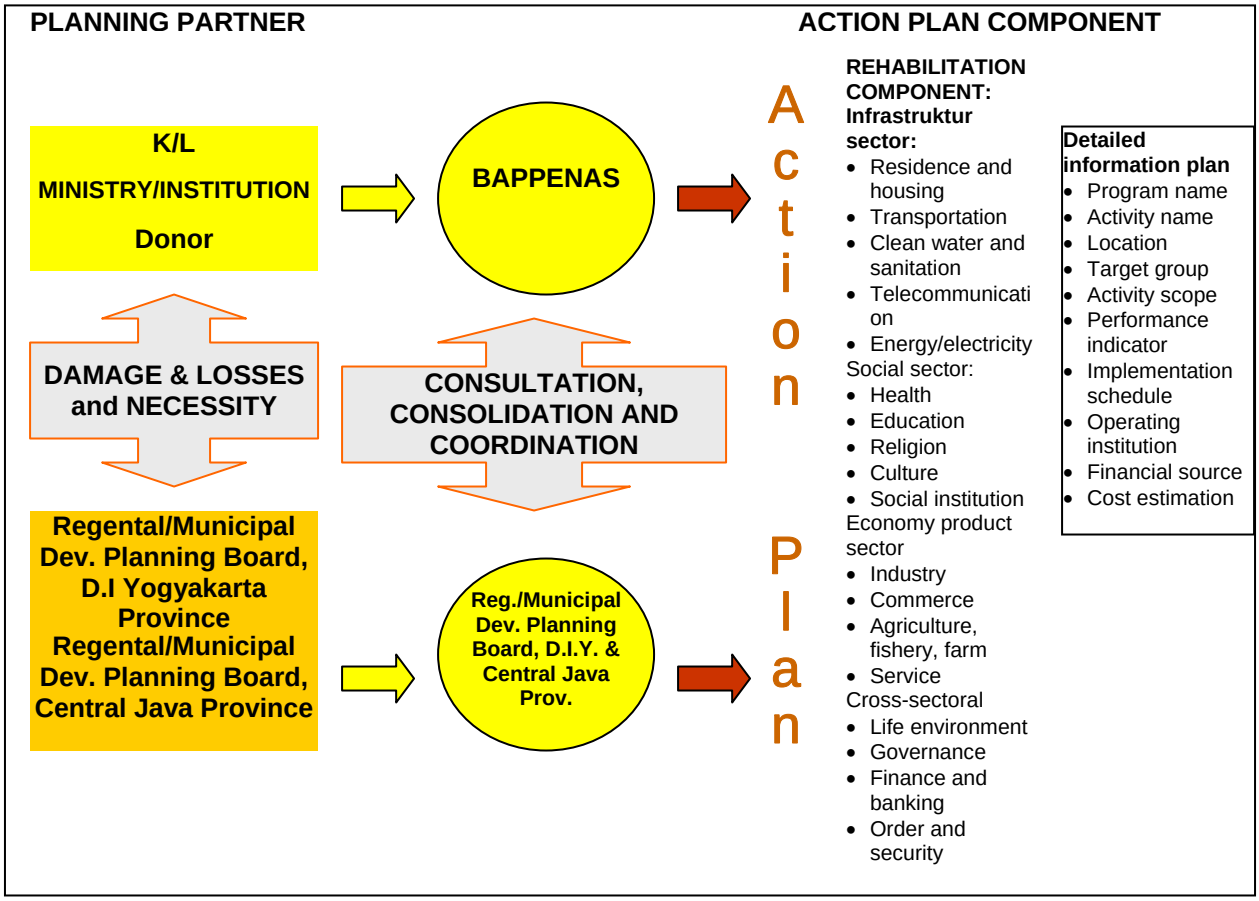
After the Action Plan components defined, the next process is to arrange a book of Action Plan. Based on the agreement between Central and Regional Government, three books of Action Plan are agreed to arrange, comprising Primary Book and two appendix books of detailed action plan from each region. Central Government in this case of Bappenas is responsible for arranging the Primary Book of Action Plan, while Bappeda of D.I. Yogyakarta Province is responsible for arranging the detailed action plan for D.I. Yogyakarta Province namely Appendix I Book. Bappeda of Central Java Province is responsible for arranging the Appendix II Book containing detailed action plan for Central Java Province. This task distribution conducted in accordance with Presidential Decree Number 9 of 2006 concerning Reconstruction and Rehabilitation Coordination Team for Post-Calamity of Earthquake in D.I. Yogyakarta Province and Central Java Province, where both provinces are responsible for arranging the detailed action plan for rehabilitation and reconstruction in its area respectively.

The Primary Book of Action Plan contains the implementation guidance for rehabilitation entirely including policy, principle, and strategy of the rehabilitation.

Whereas Book of Appendix I and Appendix II contains the guidance of detailed action plan arrangement and rehabilitation fund need at both provinces namely D.I. Yogyakarta and Central Java Province.

The detailed Action Plan is a spelling out from action plan where its arrangement is under coordination of the planning institute according to its authority hierarchy. The detailed Action Plan of the activity and funding is proposed by municipal/regental to the provincial level and then to the central level in which for subsequently arranged to be a reference in making an implementation technical plan.

Diagram 1.2. Coordination Pattern of Action Plan Arrangement



Source: Bappenas, June 27, 2006

In application, the Reconstruction and Rehabilitation Action Plan in the area incurred the earthquake calamity in D.I. Yogyakarta and Central Java Province, the regional government at both provinces has announced to hold on general and special principle. The general principles of the action plan implementation are as follows:

1. Participation and development approach based on the people (*community-based development*);
2. Institution capacity reinforcement for disaster management handling;
3. Development of risk management capacity;

4. Comprehensive approach in handling disaster management;
5. Effective coordination and cooperation among parties at entire levels and cross-sector;
6. Implement a transparent mechanism in doing the monitoring and accountability;

While special principle that becomes the guidance in every implementation phase of reconstruction and rehabilitation is:

1. Recovery and reconstruction based on local People Empowerment conducted on the basis of Community Self-Help principle, *Mutual Assistance*, and strong will unity principle for seriously accomplishing each case and problem until finish, *saiyeg saeka praya*;
2. Aids from outside of people stricken by the disaster is just temporary and in nature of "helping the people as to be able in empowering themselves";
3. Culture and local wisdom will underlie the plan and implementation of reconstruction and rehabilitation program.

I.2 AIMS AND PURPOSES

This Book of Reconstruction and Rehabilitation Action Plan of Earthquake Post-Disaster Area in D.I. Yogyakarta and Central Java Province is arranged as activity and plan program to:

1. Create the understanding and commitment among central, provincial, municipal/regental government, business society, community, university/academician, non-governmental organization, donor agency and international society in reconstructing whole public life foundations incurred the disaster impact in D.I. Yogyakarta and Central Java Province.
2. Synchronize whole rehabilitation plan activities of the earthquake post-disaster arranged by central government in this case is minister/institute, provincial, regional and municipal/regental government incurred calamity in D.I. Yogyakarta and Central Java Province;
3. Conform the plan conducted by central, provincial and municipal/regental government to the Mid-Term Development Plan (MTDP). (RPJM);
4. Harmonize the reconstruction and rehabilitation plan for post-disaster to annual plan of central, provincial and municipal/regental government enlisted into the Central and Regional Work Plan;
5. Provide a clear illustration to other stakeholders concerning the implementation of earthquake post-disaster reconstruction and rehabilitation so that there will be no any overlapping reconstruction and rehabilitation activity;
6. 4. Develop the system and funding mobilization mechanism from source of Statel Budget, Regional Budget, community and international society efficiently, effectively, transparently, participatively, and accountably, according to good governance principle.

Whereas this goal of issuing the Action Plan Book for Earthquake Post-Disaster Reconstruction and rehabilitation is:

1. Creation of mutual understanding among regional and central government and private elements, international and national society in order that earthquake post-disaster reconstruction and rehabilitation activity can be well-taken place;
2. Program plan and earthquake post-disaster reconstruction and rehabilitation activity is subjected to and in accordance with the National Development Plan System;
3. Budgeting and Planning program and activity appropriately and harmoniously to the regional and national plan document;
4. Consultative and participatory budgeting and planning, i.e. program and activity of earthquake post-disaster reconstruction and rehabilitation has been consulted and contains the input from and to the whole stakeholders;
5. Make easy monitoring and controlling performed to the earthquake post-disaster reconstruction and rehabilitation;
6. Fund resource management and utilization for the earthquake post-calamity reconstruction and rehabilitation that is subjected to "*prudent*" and "*accountable*" principle.

I.3 SCOPE

This Action Plan for the Earthquake Post-Disaster Reconstruction and Rehabilitation entirely comprising three books, namely:

Main Book : Reconstruction and Rehabilitation Action Plan of the Earthquake Post-Disaster Area in D.I. Yogyakarta Province and Central Java Province;

Appendix I Book : Reconstruction and Rehabilitation on Detailed Action Plan of the Earthquake Post-Disaster Area in D.I. Yogyakarta Province;

Appendix II Book : Reconstruction and Rehabilitation on Detailed Action Plan of the Earthquake Post-Disaster Area in Central Java Province.

This *First Chapter* of the Reconstruction and Rehabilitation Action Plan Primary Book for the Earthquake Post-Disaster Area contains the background, purpose and goal, scope and implementation term of this action plan.

The *Second Chapter* of Primary Book describes general description of the region incurred disaster impact in Yogyakartta Special District Province and Central Java Province as follows: (1) area location incurred disaster impact; (2) culture and social condition; (3) economic condition, and (4) housing condition, means and public infrastructure. The general description is summarized on the second chapter before the earthquake occurs.

In *Third Chapter* of this Primary Book describes post-earthquake damage and loss estimation in D.I. Yogyakarta and Central Java Province. In this chapter describes about: (1) Damage and loss assessment methodology; (2) the Damage and loss

estimation on settlement and housing sector; (3) the Damage and loss estimation on public infrastructure and means sector; (4) Damage and loss estimation on productive economy as well as the damage and loss impact estimation.

This *Fourth Chapter* of book describes the Policy, Reconstruction and Rehabilitation Strategy and Principle. Detailed description is (1) Reconstruction and Rehabilitation General Policy; (2) Principles underlying the Reconstruction and Rehabilitation activity; and (3) Strategy applied in the Reconstruction and Rehabilitation activity.

The *Fifth Chapter* of the book describes matters related to the Fund, Coordination, and Controlling of the Rehabilitation and Reconstruction. The detailed description is (1) Fund Mechanism of Reconstruction and Rehabilitation activity; (2) Public Service/Goods Procurement Guidance; (3) Institution Coordination of Reconstruction and Rehabilitation Implementer; and (4) Reconstruction and Rehabilitation Activity Control.

In *the Sixth Chapter* of the Primary Book contains about Disaster Risk Mitigation in area of D.I. Yogyakarta Province and Central Java Province. In each sub-chapter contains: (1) Early Warning System Development; (2) Alert reinforcement in confronting disaster; (3) Institution reinforcement in prevention and controlling of the disaster; and (4) People empowerment in prevention and controlling of disaster.

Meanwhile, the Appendix I book contains the guidance of the detailed action plan arrangement and the reconstruction and rehabilitation fund need in D.I. Yogyakarta Province, and Appendix II book contains the guidance of detailed action plan arrangement and the reconstruction and rehabilitation fund need in Central Java Province.

I.4 DURATION OF ACTION PLAN IMPLEMENTATION

This Action Plan Implementation of the Earthquake Post-Disaster Reconstruction and Rehabilitation in D.I. Yogyakarta Province and Central Java Province involves period of 18 (eighteen) months starting to come into force since the second semester of 2006 fiscal year until finishing at the end of 2007 fiscal year. But if deemed necessary with issuing additional decree, this Action Plan Implementation of the Earthquake Post-Disaster can be given an additional period for not more than 12 (twelve) months later. In other words, this Action Plan of Earthquake Post-Disaster Reconstruction and Rehabilitation is able to finish until the end of 2008 fiscal year.

In the reconstruction and rehabilitation activities, the settlement and housing recovery and public infrastructure and means recovery is a vital priority expected to able to finish immediately at the end of 2007, aiming that:

1. Earthquake disaster victim people can return their own house immediately.
2. General service can be immediately carried out in order to support the living and people activity as usual.
3. Support regional economy revitalization efforts

While societal and regional economy revitalization is a long-term effort expected to able to reach at the end of the second semester in 2008. Through Diagram 1.3 and 1.4 hereunder, it can be paid close attention the action plan implementation agenda and

sequence that has been stipulated in the period of 30 months ahead until the end of next 2008.

Diagram 1.3. Post-Disaster Recovery Stages

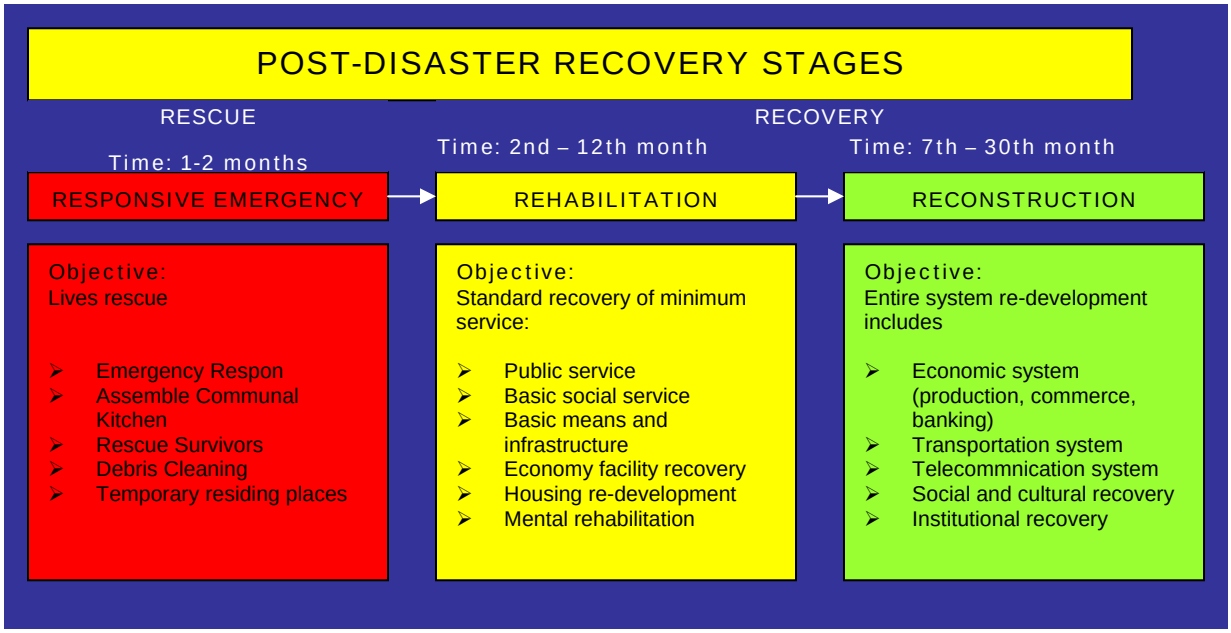


Diagram 1.4. Time Framework of Post-Disaster Recovery

No		Recovery Efforts	2006		2007		2008	
			I	II	I	II	I	II
A. EMERGENCY RESPONSES								
B. REHABILITATION & CONSTRUCTION :								
1	**Housing and Settlement**							
	a.	resettlement for refugees and recovery on environmental infrastructure of the settlement in the frame of minimum service standard						
	b.	enhancement of basic infrastructure service system of housing and settlement environment						
2	**Recovery on Public Infrastructure**							
	a.	recovery of public infrastructure service in the frame of SPM						
	b.	enhancement of thoroughly public service system						
3	**Revitalization of Regional Economy**							
	a.	supply for job opportunity for disaster-victim society.						
	b.	enhancement of economic activities of community and region						
	c.	target achievement for Gross Regional Income						

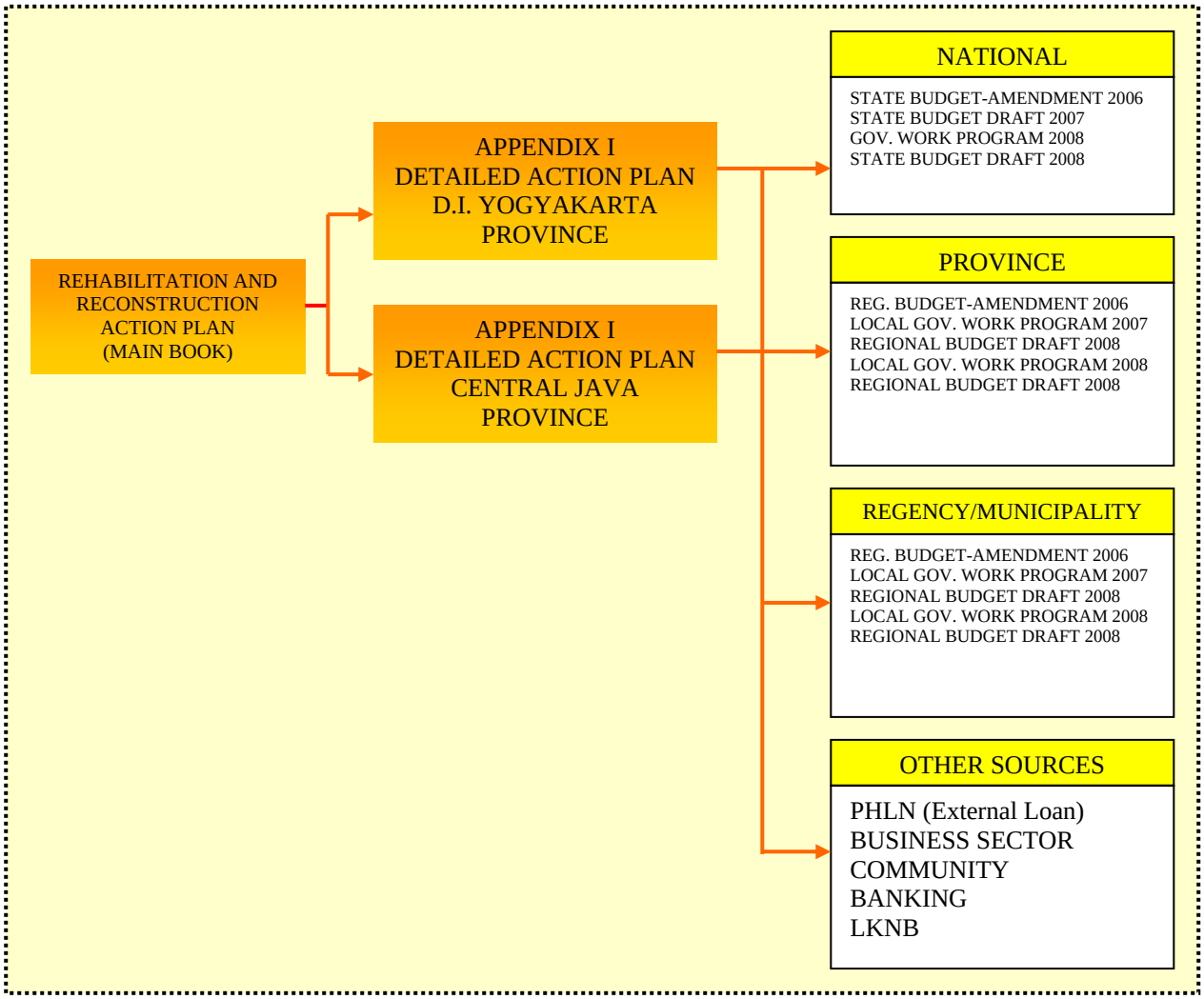
Furthermore, in line with the National Development Plan System (NDPS), in accordance with Law Number 25 of 2004 had been mandated that any planning document shall be a result of consultative and participative planning process. Similarly to this Reconstruction and Rehabilitation Action Plan. Prior to be validated as a planning document, regional and central government agree with arranging an Action Plan that will be used as a guidance of the reconstruction and rehabilitation activity in the area incurred disaster impact in D.I. Yogyakarta Province and Central Java province. The Action Plan Arrangement Process, this Action Plan Draft had been discussed in three times Dialogue and Public Consultation on June 7, 2006, June 27, 2006, and July 7, 2006, prior to ultimately finalized on July 17, 2006.

As a planning document underlying the reconstruction and rehabilitation activity that will be conducted in the period of three fiscal years, then this action plan book has linkage to the arrangement of annual development budgeting and planning document in the budgeting and development context either at central or regional level. Through the following Diagram 1.5 it can be paid close attention the linkage between this action plan document and arrangement of budgeting and planning document in at central, provincial, and municipal/regental in post-disaster area in D.I. Yogyakarta and Central Java Province.

Through Diagram 1.5, it then can be comprehended that in the period of 3 (three) years, starting from 2006 until 2008 ahead, whole budgeting and planning

documents at regional and central level related to reconstruction and rehabilitation activity for the earthquake post-disaster area in D.I. Yogyakarta Province and Central Java Province will use action plan for reference as in arrangement of Government Working Plan document and Regional Working Plan document and National Income Plan document and Regional Income Plan document in respective region.

Diagram 1.5. Linkage of Rehabilitation and Reconstruction Action Plan and Annual Budgeting and Planning Process



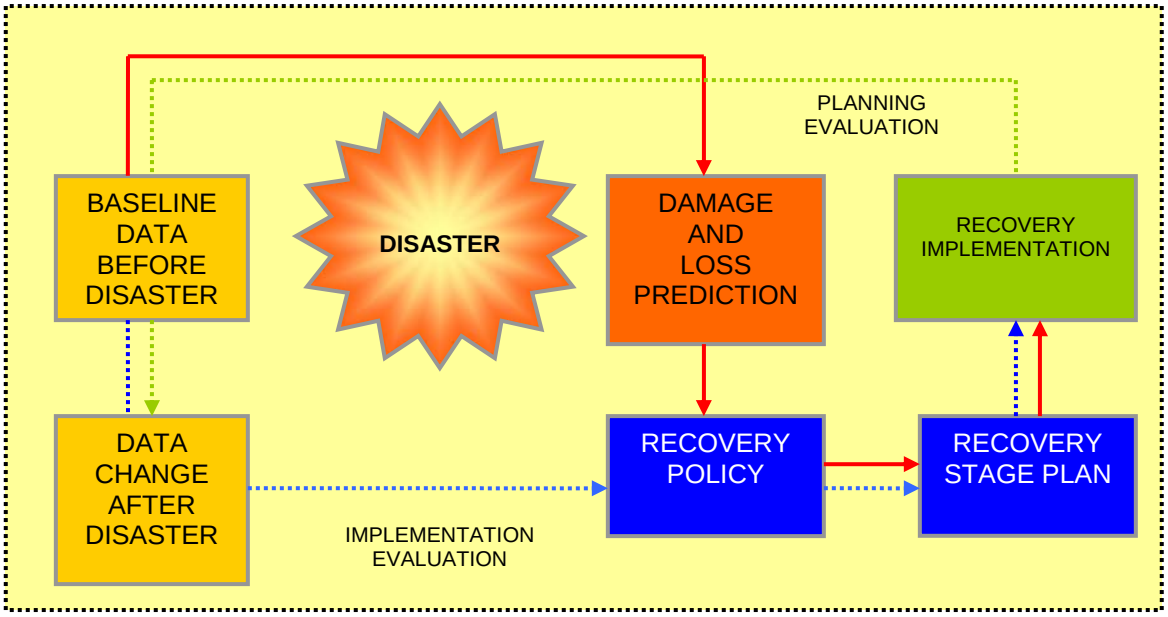
CHAPTER II
GENERAL DESCRIPTION OF REGIONS STRICKEN BY DISASTER IMPACT

For action plan arrangement of post-disaster reconstruction and rehabilitation, it needs A description about condition of the area incurred disaster listed in figure, hence *a baseline data* needs to arrange. *The Baseline data* including geology condition, demography, psychology, means and infrastructure, economy and social-culture in area incurred calamity prior to disaster occurred.

The Baseline data is extremely needed in a planning document in this case of action plan for post-earthquake reconstruction and rehabilitation in D.I. Yogyakarta Province and Central Java Province as a reference in formulating the plan policy, task plan, task implementation and evaluation for the implementation of the reconstruction and rehabilitation activities.

Other important things are updating data post-disaster aiming at knowing the magnificent impact resulted in the earthquake disaster (damage and loss), as its flow depicted in the following Diagram 2.1.

Diagram 2.1. Flowchart of Data Base for Planning Purpose



In this action plan arrangement for post-disaster reconstruction and rehabilitation either in central or regional government agrees by using village potential data in 2003 and 2005 arranged by Statistics Central Agency of the Republic of Indonesia. As an additional data, it also used the data frome provincial government.

II.1 LOCATION AFFECTED BY DISASTER IMPACT

A tectonic earthquake with the power to reach 5.9 Richter scale occurred on May 27, 2006 had resulted in the life victim and damage including D.I. Yogyakarta Province and Central Java Province area. From whole regencies/cities incurred the tectonic earthquake impact, **Bantul Regency** in D.I.Yogyakarta Province and **Klaten Regency** in Central Java Province is the most severe area incurred the tectonic earthquake impact.

The area incurred the earthquake impact is situated on physical appearance (*physiography*) that is still relatively active, i.e.**tectonic** lane and **Merapi volcanic**, tectonic lane exists in earthquake area is a vital lane of the tectonic earthquake in Indonesia.

Geologically, this area is adequate complex, with the structure comprising folding and fault, most dominant geology formation is *young Merapi Mountain precipitation*. Most severe zone incurred the earthquake is the zone that occupies the geology formation in the form of precipitation layers from Merapi volcanic that is relatively soft so that the earthquake effect can reach 4 – 5 times compared to geology area with rocky structure that is relatively hard.

Area **topography** incurred earthquake dominates sloping class by 0-2% then 8-15% and 25-40%. **Hydrology** condition incurred earthquake also has resemblance such as rainfall ranges from 1500-2500 mm/year, groundwater depth is not too large, i.e. less than 10 m. But at zone incurred earthquake impact is the area relatively hard to get water.

Apart from bringing about life victim; the earthquake also causes damage and loss in other fields such as: **social and culture, economy,** and **housing, means and public infrastructure**.

Area incurred earthquake impact on May 27, 2006 in the **D.I. Yogyakarta Province** including Bantul Regency, Yogyakarta City, Gunung Kidul Regency and Kulon Progo Regency. Bantul Regency is the most severe area incurred tectonic earthquake impact comprising 17 sub-district areas with the life victim attaining to 4,143, and building damage as well as severe damage reaches to 45%.

Table 2.1. Data of Yogyakarta Province Population Before Disaster

Districts/City	Population (lives)
Bantul	800,569
Sleman	895,408
Yogyakarta	515,976
Gunung Kidul	747,782
Kulon Progo	447,695
Total	**3,407,430**

Source: Podes-BPS 2005

While in **Central Java Province**, Klaten Regency is the most severe area incurred earthquake impact on May 27, 2006 by dead victim attained to 1.045, with distribution area in seven sub-districts undergo most severe impact from total 26 sub-districts existing in Klaten Region area.

Apart from Klaten Region area, the tectonic earthquake impact also including other regencies in Central Java Province among others: Magelang Regency, Boyolali, Purworejo, Sukoharjo and Wonogiri Regency.

Table 2.2. Data of Central Java Province Population Before Disaster

Districts/City	Population (lives)
Klaten	1,281,061
Magelang	1,158,138
Boyolali	941,808
Purworejo	718,513
Sukoharjo	817,108
Wonogiri	1,125,246
Karanganyar	831,721
Kebumen	1,207,717
Temanggung	705,342
Total	**8,786,654**

Source: Podes-BPS 2005

II.2 PUBLIC HOUSING, FACILITIES AND INFRASTRUCTURE

Besides **housing**, earthquake impact had also destructed the public facilities and infrastructures such as **Transportation, Energy, Water and Sanitation** and **Telecommunication**.

In **Housing Sector**, **D.I. Yogyakarta** Province and regencies incurred earthquake impact in **Central Java** Province have total private house number by 2.1 million, more than two folds of total number housing in Aceh. Housing number in regency that is mostly incurred the earthquake impact is 984,000. Klaten Regency has the largest house number (280,500), Sleman at the second sequence (197,000), and Bantu at the third one (182,000).

D.I. Yogyakarta and the **Central Java** Province areas having the highest population density figure in Indonesia, particularly in Bantul Regency and Klaten Regency having more than 1,600 people per km square, or more dense 50% over density level average in Java Island.

Table 2.3. Data of Number of Houses in Yogyakarta and Central Java Provinces

Districts/City	Pre-Disaster Number of Houses
D.I.Yogyakarta Province	
Bantul	181,991
Sleman	196,965
Yogyakarta	78,079
Gunung Kidul	15,857
Kulon Progo	8,794
Total	**703,545**
Central Java Province	
Klaten	280,513
Magelang	285,401
Boyolali	219,537
Purworejo	177,882
Sukoharjo	
Wonogiri	
Karanganyar	
Kebumen	
Temanggung	
Total	**963,333**
TOTAL D.I.YOGYAKARTA-CENTRAL JAVA	**1,666,878**

Source: DIY Media Center, and Podes BPS 2003

Transportation Sector comprises road transportation, railway, and air transportation. **Road transportation** is split into three types according to maintenance responsibility, i.e: National Road by Central Government, Provincial Road by the Provincial Government, and City/Regency Road by the Municipal/Regental Government. Besides, there is still any known as village road that usually self-managed by people and Regental Government. Facilities and infrastructure of railway transportation is managed and maintained by PT-KAI which is also to be mass transportation facilities that are frequently used by people. For **air transportation**, Adi Sutjipto Airport is managed by PT. Angkasa Pura I located **D.I. Yogyakarta** Province with the runway length reaches 2,200 m and terminal width can be landed by large body plane such as Boeing, Airbus and alike.

Table 2.4. Data of Transportation of Yogyakarta Province

	Pre-Disaster Road Length	
Land Transportation		
- National Road	169	Km
- Provincial Road	690	Km
- Regental Road	4,044	Km
- Village Road	2,000	Km
Air Transportation		
- Anvil	2,200	m
- Passenger Terminal	1,200	m^2

Source: Department of Transportation, June 2006

In **Energy Sector**, area incurred impact usually obtain electric current through 500KV grids and center for coal power electric generator in Paiton, East Java, and State-Owned Electricity Enterprise (PLN) has no significant generator capacity in area incurred the impact. Center for Controller and Load Regulator (CCLR) of Java-Bali PLN manages transmission grid at 500KV and regional 150KV-transmission grid. Distribution business unit for Central Java Province manages distribution grid and electricity selling to higher and middle tension electricity consumer in all areas incurred the impact. **Pedan sub-station that is currently constructed is the most important segment in Java-Bali 500KV-grid**, situated in south 500KV-lane when it is completed will connect Paiton via Kediri, Pedan and Tasikmalaya up to Depok (Jakarta). There is also 500KV channel from Pedan to Ungaran (Semarang) through north 500KV-lane (*Damage and Loss Assessment*, Bappenas-World Bank, 2006).

For **Sanitation and Water Sector**, urban water supply in area incurred the earthquake provided by Drink Water Regional Corporation (PDAM) and, except in area of D.I. Yogyakarta Province and surrounding, the sanitation service provided by regional government through Cleanness and Garden Service (DPK). In area of D.I. Yogyakarta Province and around comprising Yogyakarta City, Bantul and Sleman Regency, sewage duct are managed and operated together with provincial government, Yogyakarta City Government, Bantul and Sleman Regency. Generally, in Indonesia, PDAM coverage is limited so that most of urban household and almost all rural household rely on self-efforts through shallow groundwater extraction, rain-shed, or water surface utilization from the river and spring.

As much as 85-95% villages in Bantul Regency, **D.I. Yogyakarta** Province and Klaten Regency in **Central Java** Province use the well as water source. The well and toilet within a house is usual thing, and feces' man disposal to the river has already been a common practice in rural area. Yogyakarta City People who deserves the water from PDAM just about 35%. In Bantul Regency, the water supply comprises 12 units, one for Bantul City and eleven for sub-district area channels in the district, whereas Klaten, the water stock coverage prior to earthquake attains to 56% for city and 14% for regency as whole (*Damage and Loss Assessment*, Bappenas-World Bank, 2006).

In **Telecommunication Sector**, currently for mail service carried out by PT. Pos Indonesia, while for telecommunication line apart from PT. Telkom private party also conducts it.

II.3 SOCIAL AND CULTURAL CONDITIONS

Besides life victim, earthquake disaster also brings about damage in some sectors and living areas. One of those is **Cultural and Social** sector including Education, Health, Religion and Culture.

Generally, in D.I. Yogyakarta Province, the social order and custom is mostly still well-maintained, similarly with the religious member harmony that remains to keep. Security condition is also relatively *conducive* because its people still extremely hold mutual-help solidly.

In **Educational Sector**, D.I. Yogyakarta Province is one of education centers in Indonesia, having much more universities, junior/senior high school, and elementary school. Education achievement in D.I. Yogyakarta Province is over the national average, while in Central Java Province the grade approaching the average. In 2004, the school pure participation grade approached the national average grade, i.e. 93%, by participation level composition is equal between boys and girls. Pure participation grade in D.I. Yogyakarta Province for tertiary education attains to 43.6% and Central Java Province at 6.9%. Physical access to school in Yogyakarta is primary factor to find out a higher participation grade. In 2005, 70% from all villages in D.I. Yogyakarta Province had junior high school compared to Central Java and in entire countries that only reached to 30%.

Table 2.5. Number of Educational Buildings of Yogyakarta Province

Districts/ City	TK/RA	SD/Mi	SMP/MTs	SMA/MA	SMK	SLB	PT
Bantul	481	485	108	44	34	11	21
Sleman	462	530	122	55	44	15	38
Yogyakarta	206	245	66	54	25	6	55
Gunung Kidul	537	578	120	22	22	4	3
Kulon Progo	303	397	77	28	28	6	5
Total	**1,989**	**2,235**	**493**	**203**	**153**	**42**	**122**

Source: Podes-BPS 2005

Note:
TK/RA : Kindergarten/Islamic Kindergarten
SD/Mi : Elementary School/Islamic Elementary School
SMP/MTs : Junior High School/Islamic Junior High School
SMA/MA : Senior High School/Islamic Senior High School
SMK : Vocational High School
SLB : Special School for Disabled People
PT: University

Table 2.6. Number of Educational Buildings of Central Java Province

Districts/ City	TK/RA	SD/Mi	SMP/MTs	SMA/MA	SMK	SLB	PT
Klaten	858	880	138	44	47	7	8
Magelang	739	924	186	53	29	5	8
Boyolali	607	773	121	50	23	6	2
Purworejo	401	607	121	30	35	3	8
Sukoharjo	471	545	73	28	14	4	6
Wonogiri	461	873	127	27	33	2	2
Karanganyar	514	551	93	20	21	4	10
Kebumen	601	954	169	33	48	3	6
Temanggung	440	581	100	23	12	0	3
Total	**5,092**	**6,688**	**1,128**	**308**	**262**	**34**	**53**

Source: Podes-BPS 2005

Note:
TK/RA : Kindergarten/Islamic Kindergarten
SD/Mi : Elementary School/Islamic Elementary School
SMP/MTs : Junior High School/Islamic Junior High School
SMA/MA : Senior High School/Islamic Senior High School
SMK : Vocational High School
SLB : Special School for Disabled People
PT: University

In **Health Sector**, health status in D.I. Yogyakarta Province exists among the best ones in Indonesia, followed by Central Java Province, primarily in regencies close to D.I. Yogyakarta Province. Man Development Index (MDI) for Yogyakarta exists in the highest third sequence in Indonesia, while MD for Central Java Province approaches the national average. Health status for D.I. Yogyakarta and the Central Java Province reflects those HDI's grades. In 2002, average living expectation rate had reached to 73.0 years in D.I. Yogyakarta Province compared with 68.9 percent in the Central Java Province and 67.8 years Indonesia thoroughly. In 2004, infant mortality rate in D.I. Yogyakarta Province was 23.3 per thousand living births, far below Central Java Province at 34.1, and national average at 35. Malnutrition still became a sustainability problem. In 2004, 16.9 percent children under-five-year of age in D.I. Yogyakarta Province and 29.0 percent in Central Java Province was lack of body weight compared with national average, 29.0 percent. Health center population ratio was about 25,000 in D.I. Yogyakarta Province in 2002, compared with 36,000 in Central Java Province and 39,000 in Indonesia. The high ratio in D.I. Yogyakarta Province creates other high quality indications. For example, in 2004, 84.7 percent of birth helped by modern medical personnel compared with 66.3 percent in Central Java province and 64.3 percent in Indonesia (*Damage and Loss Assessment*, Bappenas-World Bank, 2006).

Table 2.7. Number of Health Facilities of Yogyakarta Province

District/City	Hospital	Maternal Hospital	Polyclinic	Pus-kesmas	Pustu	Doctor's Practice	Midwife's Practice	Pos-yandu	Polin-des	Drug store	Special Drug store
Bantul	7	45	31	26	67	188	181	1,023	8	35	37
Sleman	14	56	23	27	69	473	219	1,224	34	81	72
Yogyakarta	11	16	20	15	14	333	16	602	-	108	49
Gunung Kidul	3	13	17	35	115	55	126	1,304	16	5	4
Kulon Progo	3	17	6	21	62	55	89	881	27	4	7
Total	**38**	**147**	**97**	**124**	**327**	**1,104**	**631**	**5,034**	**85**	**233**	**169**

Source: Podes-BPS 2005
Note :
Puskesmas : Public Health Center
Posyandu : Intergrated Health Service Post
Polindes: Village Polyclinic
Pustu : Supporting Public Health Center

Table 2.8. Number of Health Facilities of Central Java Province

District/City	Hospital	Maternal Hospital	Polyclinic	Pus-kesmas	Pustu	Doctor's Practice	Midwife's Practice	Pos-yandu	Polin-des	Drug store	Special Drug store
Klaten	11	139	136	35	90	232	384	2,085	152	56	40
Magelang	4	19	22	28	68	106	332	1,987	225	16	42
Boyolali	9	41	97	28	64	115	270	1,543	119	28	30
Purworejo	10	17	29	22	64	99	263	1,452	136	12	22
Sukoharjo	7	73	26	21	54	198	232	974	104	39	76
Wonogiri	5	62	59	38	131	111	205	1,866	146	15	40
Karanganyar	6	79	54	21	64	143	205	1,262	113	24	29
Kebumen	8	31	39	37	81	93	243	1,624	169	10	30
Temanggung	4	20	11	23	40	65	243	1,288	151	13	20
Total	**64**	**481**	**473**	**253**	**656**	**1,162**	**2,377**	**14,081**	**1,315**	**213**	**329**

Source: Podes-BPS 2005
Note :
Puskesmas : Public Health Center
Posyandu : Intergrated Health Service Post
Polindes: Village Polyclinic
Pustu : Supporting Public Health Center

For **Religion Sector** and **Culture**, religious life participation is adequate high in D.I. Yogyakarta and Central Java Province. Most people in both provinces are Moslem followed by a relatively small number of Christian, Buddha and Hindu followers. There are many religious facilities at village level, average at 75 households or 300 people per religious facility.

In area incurred the earthquake impact there is a Prambanan Temple, the World Remainder site from ninth century, and a number of other national inheritance sites reflecting the Indonesian history as a civilization center or Java kingdom legacy. There are 11 Hindu-Budha temple complexes, one big palace and one small palace, two-kingdom funerals, and 16 museums. Those sites are prominent location for domestic and international tourism creating a higher job opportunity for D.I. Yogyakarta and Central Java Province. Both provinces are the primary center for art education and culture.

Besides, the palace location and funeral still play a spiritual role in life of many Javanese people.

Praying places have many functions such as center for people activity and village administration, in addition to play role as a place for religious activity and education. The praying places provide a dissemination channel of people news and development information and government (*Damage and Loss Assessment*, Bappenas-World Bank, 2006).

Table 2.9. Number of Religious Facilities in Yogyakarta Province

Districts/City	Mosque	Small Mosque	Christian Church	Catholic Church	Hindu Temple	Budhis Temple
Bantul	1,457	1,566	32	23	4	0
Sleman	1,801	1,328	65	55	5	3
Yogyakarta	393	284	44	12	0	10
Gunung Kidul	1,635	701	97	34	10	4
Kulon Progo	957	956	38	53	0	5
Total	**6,243**	**4,835**	**276**	**177**	**19**	**22**

Source: Podes-BPS 2005

Table 2.10. Number of Religious Facilities in Central Java Province

Districts/City	Mosque	Small Mosque	Christian Church	Catholic Church	Hindu Temple	Budhis Temple
Klaten	2,396	1,827	132	52	56	7
Magelang	2,662	3,715	74	33	2	5
Boyolali	1,995	3,132	109	25	21	28
Purworejo	1,065	2,661	58	22	0	11
Sukoharjo	1,517	773	95	15	7	4
Wonogiri	2,174	1,160	102	43	2	19
Karanganyar	1,947	731	116	20	13	5
Kebumen	1,307	3,723	55	8	0	19
Temanggung	1,358	1,610	72	17	1	58
Total	**16,421**	**19,332**	**813**	**235**	**102**	**156**

Source: Podes-BPS 2005

II.4 ECONOMICS CONDITIONS

In the field of Economy, the earthquake on May 27, 2006 estimated to influence the economic growth. It is estimated the economic growth in D.I. Yogyakarta and Central Java Province in a year ahead will be hampered until 0.3 percent, some economy sectors incurred the earthquake among others are **Agriculture, Fishery, Industry, Tourism and Trading**.

The area incurred the impact produces the smallest income like other poor regencies in Indonesia, extremely depend on Public Allocation Fund (PAF) from central government. In Bantul and Klaten Regency, the regional native income resource only

produces 6 percent from total income. Income from non-tax product shares fund (from natural resources) in general, the smallest one in all regencies (less than 0.1 percent from entire incomes). Whereas the income from tax product sharing produces less than 4 percent from whole incomes in most regency incurred the impact except for Yogyakarta City and Sleman Regency (*Damage and Loss Assessment*; Bappenas-World Bank, 2006).

As many as 880,000 poor people live in area incurred by the earthquake impact. Two from five regencies and cities in D.I. **Yogyakarta Province** (33 percent from provincial population) are the poorest compared with other regencies in Indonesia. Klaten Regency, Gunung Kidul and Kulon Progo Regency are the poorest regencies with the poverty level around 25 percent (on the third sequence in ten poorest regencies compared with other regencies in Indonesia). Nevertheless, the poverty percentage is lower in Bantul Regency, Sleman Regency, and Yogyakarta City. In provincial level, the poverty percentage in the Special Region of Yogyakarta Province around 19 percent is on the fifth sequence from ten poorest provincies in Indonesia. However, the poverty percentage in Central Java Province is little bit higher than in D.I.Yogyakarta Province.

Table 2.11. Poverty Indicators in Yogyakarta and Central Java Provinces (2004)

	Population (Thousand)	Poor Population (Thousand)	% Poverty
D.I. Yogyakarta Province	**3,224**	**616**	**19.1**
Bantul	819	152	18.5
Gunung Kidul	687	173	25.2
Kulon Progo	376	95	25.1
Sleman	945	147	15.5
Kota Yogyakarta	396	50	12.7
Central Java Province	**32,543**	**6,844**	**21**
Klaten	1,132	264	23.3
Magelang	132	186	16
Boyolali	942	172	18.4
Sukoharjo	838	118	14.3
Wonogiri	1,011	246	24.4
Purworejo	712	167	23.5
All Provinces in island of Java	120,000	20,200	16.8
Indonesia	**209,000**	**35.900**	**17.2**

Sources: SUSENAS 2004

For **Agricultural Sector**, from 58,000 ha of land used for cultivation in area of **Klaten Region**, **Central Java** Province prior to the earthquake was about 5.670 ha of land used for paddy field. For warehouse and storage were 14,873 units established prior to the earthquake.

Irrigation Scheme: There are about 474 irrigation schemes including total area at 63,800 ha in **D.I.Yogyakarta** Province, and 409 irrigation schemes including total area of 29,190 ha in Klaten Regency, **Central Java** Province. Prior to the earthquake, the irrigation schemes in D.I.Yogyakarta Province produced around 393,800 tons of hull-

paddy/year (IDR 474 billion based on the farmer's price) and about 153,700 tons of secondary crops (corn, peanut, cassava, etc) per year (estimated IDR 134 billion). Meanwhile, in Klaten area was 36,000 tons of rice produced per year (IDR 43 billion) and 12,200 tons of secondary crops (IDR 7 billion).

In **Fishery Sector**, particularly for the district of **Yogyakarta** Province has the fishery infrastructure among others: Fish Auction Place, Fish Landing Port, Breeding Pond, Fish Seed Office, Sea-Fish Seed Office, Hygienic Fish Market, Raiser, Laboratory for Guidance and Fishery Product Quality Examination, and Central Fish Seed Office.

In **Industrial Sector**, D.I. Yogyakarta Province and Central Java Province are the industrial centers such as skin handicraft industry, roof-tile, silver, ceramic, food small industry, free natural silk, aluminum casting, garment industry, furniture, etc. Besides the industry, there is also cooperation unit and mid-small business. Percentage of mid-small business is 97 percent from 117,000 business units, 65 percent from 650,000 workers, and 40 percent from the whole output values. Primary sectors are utensil 25 percent, 25 percent of handicraft, and 20 percent of textile. Approximately, 25 percent of industrial output is exported – combination export values (from all companies in these sectors) namely USD 144 million in 2005 (17 percent growth over output of 2004). Most of small business has an access to the bank (there are more than 120,000 borrowers in disaster area), direct export channel and many micro-companies as a supporting industry. There are only 71 producers and large logistic company.

Table 2.12. Industry, Cooperation, and SME in Yogyakarta and Central Java

Province	Total Industry	Total Cooperatives	Total SME
D.I. Yogyakarta	2,783 units	-	-
Central Java	4,201 units	241	64,953

Source: Cooperatives and SME Office, DI Yogyakarta and Central Java Province

In **Tourism Sector**, particularly Yogyakarta City, a place for the tourism is an area that most severe of the earthquake disaster impact as most income of Yogyakarta City are derived from the service and trading that includes the tourism service in it. In D.I. Yogyakarta Province, the service, trading, restaurant and hotel, and transportation sector provide contribution by 64 percent to the Gross Regional Domestic Product (*Data PDRB*; BPS; 2004).

In **Trading Sector**, in recent years, the role of trading sector and restaurant is rather increasing in economic. This sector provides contribution by 20 percent from the Gross Regional Domestic Product (GADP) of D.I. Yogyakarta Province, whereas non-governmental service sector remains around 4 percent. The trading role varies from 7 percent in Yogyakarta City until 20 percent in Kulon Progo, while the restaurant is from 2 percent in Kulon Progo to 15 percent in Yogyakarta City. The service sector is only at 2 percent for the regional product in Gunung Kidul, and 6 percent in D.I. Yogyakarta Province. Entirely, the relative role of the trading sector and restaurant if merged ranging from 7 percent in Magelang up to 24 percent in Klaten and D.I. Yogyakarta Province.

Number of Traditional markets decreased to 18 percent between 2003 and 2005 due to any competition with modern market and franchise. Number of modern

markets (shopping center and supermarket) has grown one-thirds folds during similar period. In addition, some traditional markets have been renovated. In D.I. Yogyakarta Province, some traditional markets are in the form of permanent/semi-permanent building or exist at open place. The open market at 400 villages in Central Java province and D.I. Yogyakarta Province open two or three days in a week. New other businesses and in a rapid development are small market franchises (minimarket). In 2005, there was 28,075-licensed trader; most of them was a small merchant. As a whole, more than 300,000 people or 10 percent population in area incurred the disaster impact directly involved to the trading sector in D.I. Yogyakarta Province. It excludes people who provide a round trip transportation service to the markets, labors, and other people whose job and business are related to the operating market.

Table 2.13. Data of Traditional Market in Yogyakarta and Central Java Provinces

Districts/City	Pre-Disaster Number of Markets (unit)
D.I. Yogyakarta Province	
Bantul	7
Sleman	
D.I. Yogyakarta Province	15
Gunung Kidul	31
Kulon Progo	13
Total D.I. Yogyakarta Province	**66**
Central Java Province	
Klaten	46
Magelang	39
Boyolali	30
Purworejo	33
Sukoharjo	23
Wonogiri	112
Karanganyar	22
Kebumen	50
Temanggung	7
Total Central Java Province	**362**
TOTAL D.I. Yogyakarta and Central Java Prov.	**428**

Source: Local Govt. of D.I. Yogyakarta and Central Java Province, 2005

CHAPTER III
ESTIMATE OF POST-EARTHQUAKE DAMAGES AND LOSSES

III.1. METHODOLOGY OF LOSS AND DAMAGE ASSESSMENT

In order to estimate the post-earthquake damages and losses of DI Yogyakarta and Central Java, the consolidation team of BAPPENAS (National Development Planning Agency), the Ministry/Institution, Bappeda (Local Development Planning Agency) of Province, and any relevant institution in the province and regencies, as well as the *international partners coordinated by the World Bank performed the loss and damage estimation by using a methodology developed by the UN*, namely *the Economic Commission for Latin America and the Carribean (ECLAC)*. The ECLAC methodology was firstly used in the beginning of 1970s and had been modified and developed for more than 3 decades in the disaster context throughout the world.

This methodology resulted in an initial estimation from the impact of losses in the physical assets to be repaired or replaced even any other emerging losses, until those assets were repaired or rebuilt or reconstructed.

The estimation analyzed on 3 major aspects:

1. **Damages (Direct Impacts)** related to assets, stocks/livestock, and other ownerships (land, buildings/houses) were estimated with the price per unit in the amount of an appropriate compensation value (not reconstruction). For the estimate of damages, the unit price was used in accordance with the prevailing regulation.
2. **Losses (Indirect Impacts)** on the affecting matters such as income to be decreasing, costs to be increasing, etc., up to the remaining period in which those assets were recovered. These would be measured as much as the present value. The definition of such period was not an easy matter (in fact, it was difficult/most critical). While recovery and restoration activities spent more times than those expected, like in Aceh, the losses might be continually getting increase.
3. **Economic effects**/the effects on macro economic conditions (frequently called as the secondary impacts) including fiscal impacts, having the implication on Gross Domestic Products/GDP, etc. This analysis can be also applied in the regional level.

III.2. ESTIMATION ON LOSS AND DAMAGE

III.2.1. HOUSING SECTOR

The earthquake on 5.9 Richter Scale shook D.I. Yogyakarta and Central Java Province on May 27, 2006 had caused tremendous damages and losses of properties, assets and life. The emerging losses consisted of *housing, public means and*

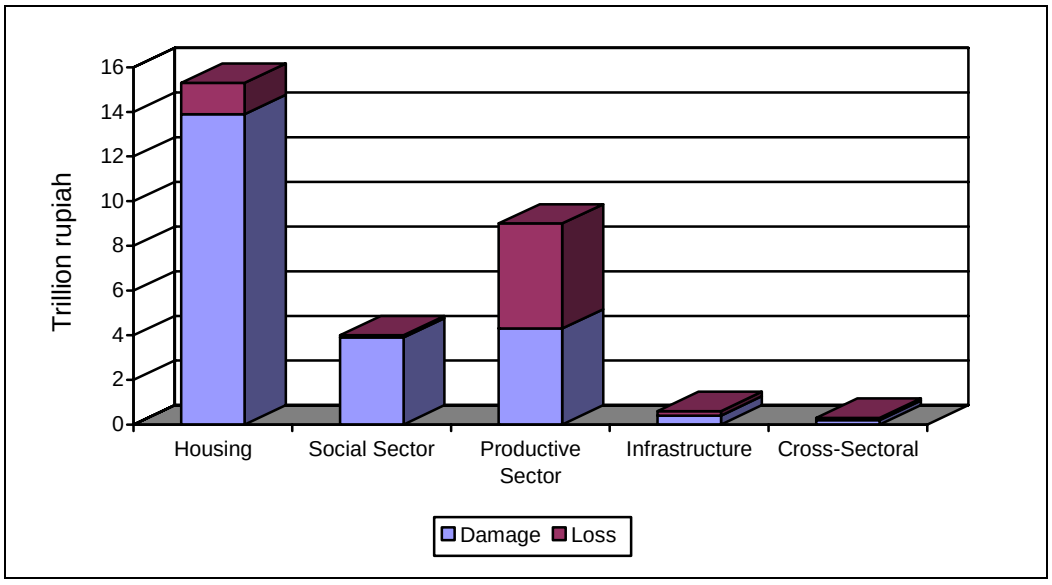
infrastructures and productive sectors. From these three sectors, housing was exposed by the worst impact. Total damages and losses were estimated up to IDR. 29.1 trillion (Table 3.1). Residences were struck by the most devastating impact, as worth as more than a half of total damages and losses (IDR. 15.3 trillion). The damages and losses of buildings of private sectors and productive assets were estimated up to IDR. 9 trillion and were also estimated to be going to lose significant incomes in the future. The damages in the social sector particularly in the sector of health, education, were estimated attaining to IDR. 4 trillion. Other sectors, especially infrastructures, suffered from relatively lower damages and losses.

Table 3.1. Lost and Damage Recapitulation for Each Sector

	Damage	Loss	TOTAL
Housing	13.9	1.4	15,3
Social Sector	3.9	0.1	4
Productive Sector	4.3	4.7	9
Infrastructure	0.4	0.2	0.6
Cross-Sectoral	0.2	0.1	0.3
TOTAL	**22.8**	**6.4**	**29.1**

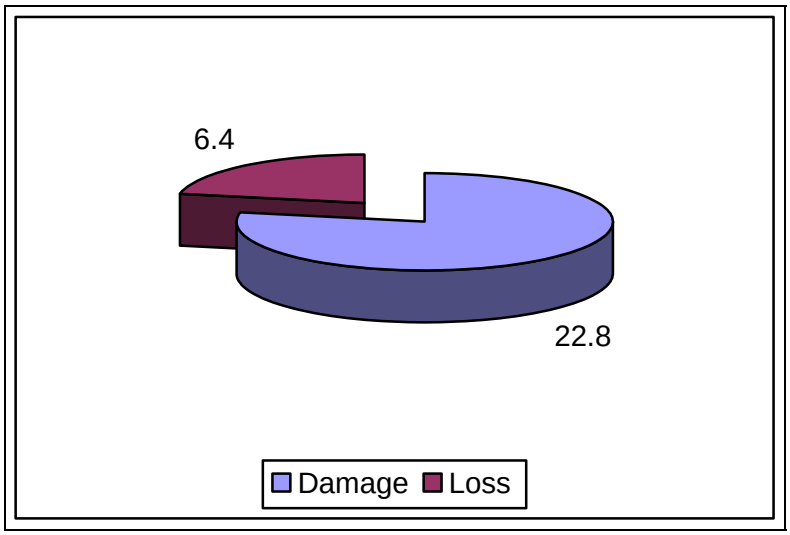
Source : Estimation on Loss and Damage, June 2006

Diagram 3.1. Lost and Damage for Each Sector



Due to the emerging damages, the loss impact was estimated up to IDR. 6.4 trillion (Diagram 3.2), most of them impacted on small and middle business, since the area was a small-scale handicraft industry center which was highly growing in Indonesia.

Diagram 3.2. Damages and Losses



The largest and highest damages and losses took place in the private sector especially in the housing and small business sectors. Considering that there were many small home-industries, economic losses resulted from the damaged or devastated houses were extremely high. Many manufacturers of furniture, ceramics, and handicrafts saw their means of livelihood were destroyed together with their houses. The destruction of personal or private assets which were not under insurances substantially added the estimated losses.

Diagram 3.3. Loss and Damage based on Ownership

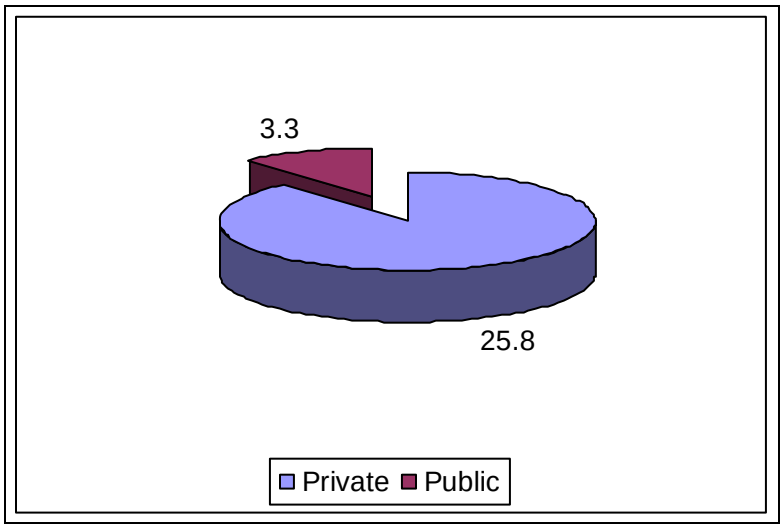
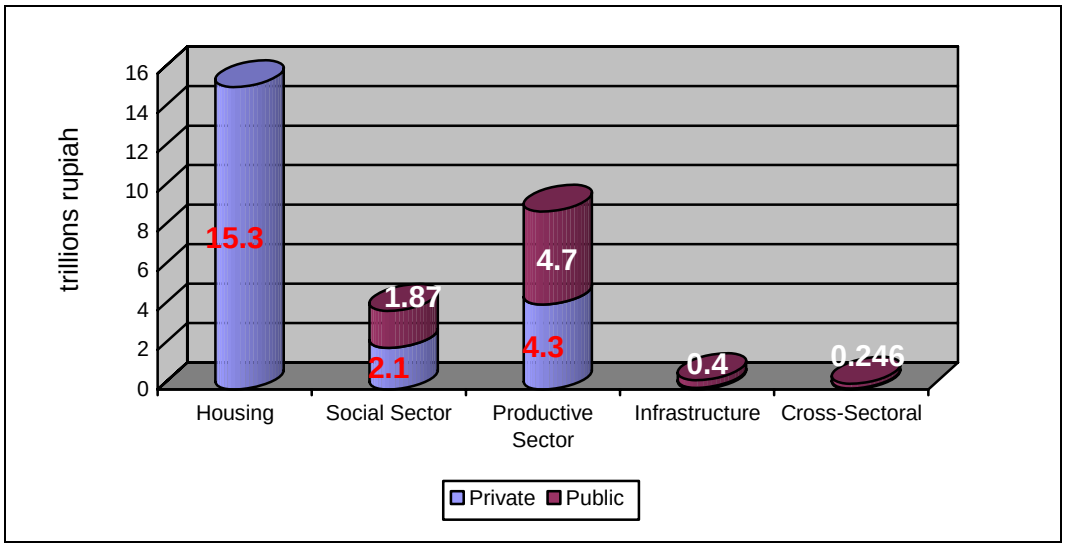
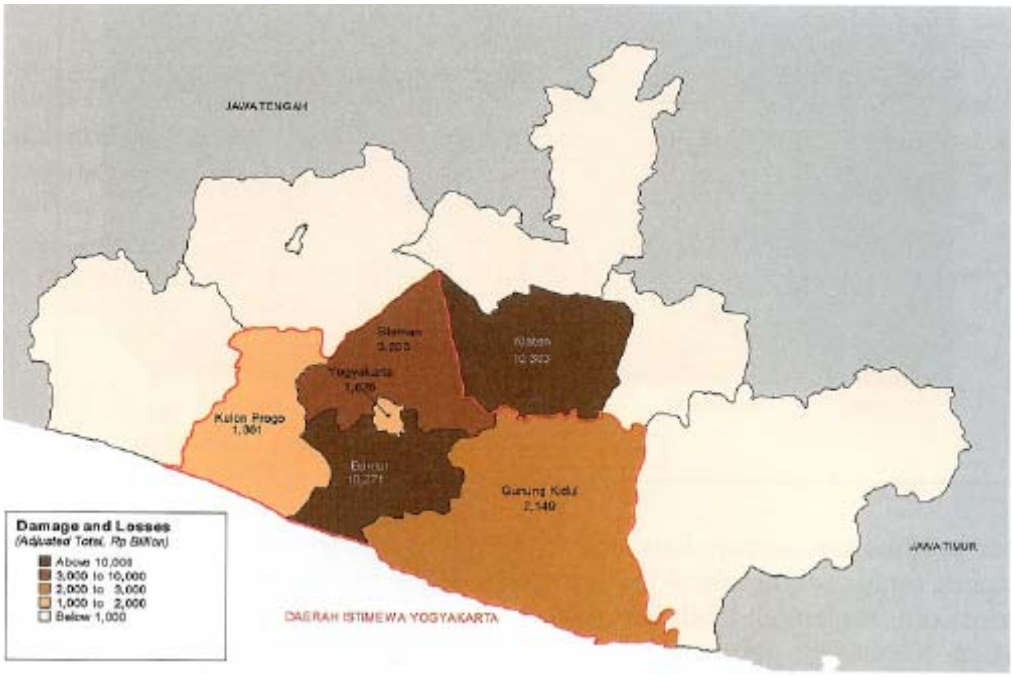


Diagram 3.4. Loss and Damage on Each Sector Based on Ownership



The housing sector constituted the sector suffering from the worst damages and losses comparing to any other sectors due to the earthquake on May 27. Total destroyed houses were estimated more than 380 residences either totally damaged or partly damaged. The worst damages occurred in Bantul Regency and Klaten Regency. The main cause of damages was that many buildings didn't have the anti-earthquake construction and used low quality construction materials so they could not hold the devastating shakes of the earthquake. In addition, the houses affected by the earthquake impact had been built for more than 15 and 25 years. Based on the acquired data, the damages and losses in the housing sector reached up to IDR. 15.3 trillion or more than a half of total amount of the estimated damage and loss.

Figure 3.1. Map of House/Building Damage Spread



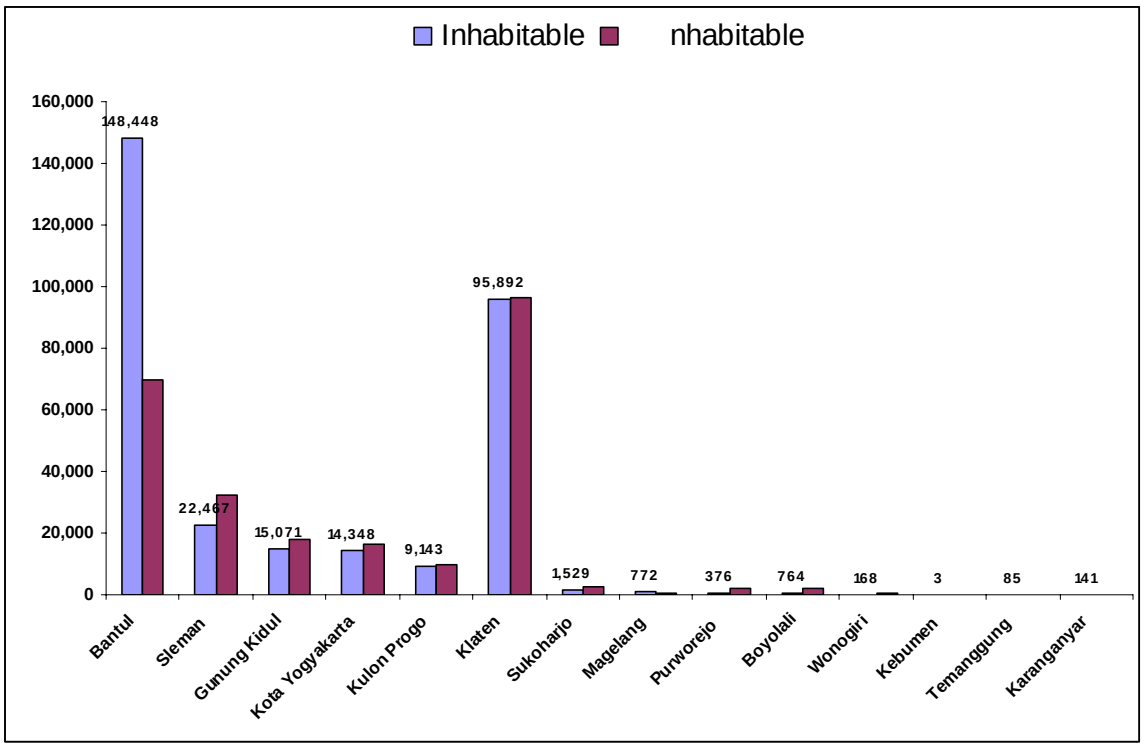
Source: the Consolidation Estimating Team based on the damages and losses of houses, June 2006

Table 3.2. Number of Damages on Housing Sector

Disticts/Cities/Provinces	No. of houses before disaster *)	Inhabitable	Habitable
Bantul	181,991	148,440	69,905
Sleman	196,965	22,467	32,446
Gunung Kidul	158,570	15,071	17,967
Yogyakarta City	78,079	14,348	16,189
Kulon Progo	87,940	9,143	9,771
D.I. Yogyakarta	**703,545**	**203,138 ***)**	**148,798**
Klaten	280,513	95,892	96,253
Sukoharjo		1,529	2,427
Magelang	285,401 **)	772	546
Purworejo	177,882	376	2,113
Boyolali	219,537	764	2,258
Wonogiri		168	309
Kebumen		3	1
Temanggung		85	68
Karanganyar		141	136
Central Java	**963,333**	**99,730**	**104,111**
Total	**1,666,878**	**302,868**	**252,909**

Source: Directorate General of Spatial, Ministry of Public Works, July 25, 2006
Notes: *) Data PODES 2003, Central Statistics Agency, 2004
**) Data including the City of Magelang
***) Data in DI Yogyakarta with moderate accuracy level, further field survey required

Diagram 3.5. Number of Damaged Houses in the Affected Areas



III.2.2. INFRASTRUCTURE SECTOR

The earthquake resulted in a relatively minor damage in the network of public roads, railway infrastructures, Yogyakarta airport, and telephone installation and also post offices (Table 3.3).

1. Transportation and Communication

The earthquake resulted in a relatively minor damage in the network of public roads, railway infrastructures, Yogyakarta airport, and telephone installation and also post offices.

In the transportation sector, the damages are on **roads and bridges** in most parts of the area but not very serious. Total damages and losses were estimated reaching up to IDR. 68.7 billion based on the data of the road damages from the Provincial Services of Public Works. All important connecting roads have been able to be used and there is no any significant impact on the smooth traffic flow.

Such damages took place in the **railway** infrastructures like on the southern part major tracks which suffered from minor damages, the station building, trains signals, and telecommunication. The minor damages also occurred on other station buildings in Yogyakarta and the surrounding including the locomotive workshops, the operational buildings, and some inns and boarding houses. Total amount of the damages reached up to about IDR. 20 billion. There was no any significant impact on the long-distance railway operation and the services have been re-functioning normally.

Some damages also took place on the **Adi Sucipto Airport** such as cracks on the anvil and one story of the building of the domestic passenger terminal was collapsed.

Emergency repairs on the cracks of the anvil have been completed quickly and the services at the Adi Sucipto Airport have run normally. The airport repairs including the asphalting of the anvil, the reconstruction of building, road and operational equipment were estimated requiring the costs as of IDR. 13.8 billion. While the repairs on the domestic check-in room, the cracks on the lobby area, and the damaged Flight Information Data System for their total costs of reconstruction and repairs were estimated up to IDR. 5.4 billion.

2. Energy

In the field of **energy/power affairs**, the damages took place in the sub-station of Pedan, the damages occurred on the current breaker of 500 KV (3 pairs), the electric switch breaker of 500 KV (5 pairs), voltage regulator of 500 KV/150 KV (2 pairs) and an electric rod of 500 KV which deactivated the connection of 500 KV of Pedan-Kediri-Paiton and Pedan Ungaran. In addition, eleven sub-stations of 150 KV in Yogyakarta Province suffered from minor damages on the buildings. Total amount of damages was estimated reaching up to IDR. 92 billion. The business unit of Central Java reported the damages on more than 140,000 costumer's connections (entirely approximately up to 6.7 millions) and on more than 880 km of the distribution gridlines of the middle-tension (30 KV and 20 KV) and 820 km of the distribution gridlines of the low-tension. Total costs of the repairs of the distribution grids and buildings were estimated by the Indonesian Power Company reaching up to IDR. 90 billion. Total losses due to the non-operation of the power current of Pedan-Kediri were estimated by the Indonesian Power Company reaching up to IDR. 150 billion.

3. Post and Telecommunication

The physical damages on the **post and telecommunication** installation took place in the regional post office of Yogyakarta and the central sorting office, some offices of branches and sub-branches and also staff housings. The total damages and losses were estimated up to IDR. 7 billion.

4. Water and Sanitation

Total damages and losses in the supply field of **water and sanitation** were estimated up to IDR. 85.6 billion. Most of damages occurred in the water supply facilities and digging wells. No supply network of piping water suffered from serious damages. In general, the damages took place on the wells belong to the community which struck down by ruins from the collapsed houses. The repair and clearing costs of ruins were estimated up to IDR. 75.5 billion.

Table 3.3. Loss and Damage Estimation on Infrastructure Sector

Sector / Sub-Sector	Effect (Billion IDR)			Ownership	
	Damage	Loss	Total	Gov.	Private
Water & Cleanliness	81.9	3.7	85.6	10.1	75.5
PDAM	5.0	3.7	8.7	8.7	-
Water supply in village	75.5	-	75.5	0.0	75.5
Urban sanitary	1.4	-	1.4	1.4	-
Energy	225.0	150.0	375.0	375.0	-
Transmission sub-station	135.0	150.0	285.0	285.0	-
Distribution Network	90.0	-	90.0	90.0	-
Transportation	90.6	0.2	90.8	90.8	-
Road	45.0	-	45.0	45.0	-
Railway	19.9	-	19.9	19.9	-
Civil Flight	18.7	0.2	18.9	18.9	-
Post and Telecommunication	7.0	-	7.0	7.0	-
Total	397.5	153.8	551.4	475.9	75.5
% total damage and loss	1.7%	2.4%	1.9%		

Source: Damage and Loss Assessment Report, June 2006

III.2.3. SOCIAL SECTOR

Besides the life victims, the earthquake disaster caused the damages in the social sector among others in the field of education, health and religious activities. In the social sector, the damages and losses were estimated totally up to IDR. 4.0 trillions.

Table 3.4. Number of Victims in Yogyakarta and Central Java

Location	Total Population Pre-Disaster *	Victim		
		Died	Seriously Wounded	Lightly wounded
Bantul	800,569	4,143	8,673	3,353
Sleman	895,408	243	689	2,539
City of Yogyakarta	515,976	204	245	73
Kulon Progo	447,695	23	82	1,897
Gunung Kidul	747,782	84	1,086	
Total DIY	**3,407,430**	**4,697**	**18,837**	
Klaten	1,281,061	1,045	18,127	
Magelang	1,158,138	10		
Boyolali	941,808	4	300	
Sukoharjo	817,108	3	67	
Wonogiri	1,125,246	-	4	
Purworejo	718,513	1	4	
Kebumen	1,207,717			
Temanggung	705,342			
Karanganyar	831,721			
Total Central Java	**8,786,654**	**1,063**	**18,502**	
Total (DIY & Central Java)	**12,194,084**	**5,760**	**37,339**	

Source: Media Center of Local Government of DIY, 17 June, 2006
*) Podes Data 2005

1. Education

For the education field, the total number of damaged school-buildings was up to 2,630 units (Table 3.5) with the total amount of damages and losses in both provinces, Yogyakarta and Central Java was estimated up to IDR. 1.74 trillion. Total damages in Yogyakarta Province were estimated reaching up to IDR. 1.3 trillion for the buildings and IDR. 58.8 billion for the educational facilities, while the total amount of damaged buildings and facilities in Central Java was approximately up to IDR. 320 billion where around 60% of damages took place in Klaten Regency.

The estimated losses comprised the costs of the provisional school facilities, new-teacher recruitment and training, fee payment for provisional teachers to substitute teachers who were injured, clearing and cleaning costs, and counseling fees. Total damages in Yogyakarta and Central Java were estimated attaining up to IDR. 55.8 billion.

Table 3.5a. School Building Damages based on Educational Level

Regency/City	Kindergarten		Islamic Kindergarten		Elementary School		MI	SLB		Junior High School		MTs
	Pre-Earthquake	Damage	Pre-Earthquake	Damage	Pre-Earthquake	Damage		Pre-Earthquake	Damage	Pre-Earthquake	Damage	
Yogyakarta City	206	45		9	245	120	2	6		66	13	4
Sleman	462	28			530	287	16	15	3	122	12	17
Bantul	481	210		10	485	446	8	11		108	86	16
Kulon Progo	303	67			397	178	10	6	1	77	28	5
Gn. Kidul	537	31		29	578	192	68	4		120	52	19
Total DIY	**1,989**	**381**		**48**	**2,235**	**1,223**	**104**	**42**	**4**	**493**	**191**	**61**
Klaten	858	4			880	229	5	7		138	20	1
Magelang	739				924			5		186		
Boyolali	607				773			6		121		
Sukoharjo	471				545			4		73		
Wonogiri	461				873			2		127		
Purworejo	401				607			3		121		
Kebumen	601				954			3		169		
Temanggung	440				581			0		100		
Karanganyar	514				551			4		93		
Total Central Java	**5,092**	**4**		**0**	**6,688**	**229**	**5**	**34**	**0**	**1128**	**20**	**1**
Total (DIY and Central Java)	**7,081**	**385**		**48**	**8,923**	**1,452**	**109**	**76**	**4**	**1,621**	**211**	**62**

Table 3.5b. Damages of School Buildings based on Educational Levels

Regency/City	Senior High School		SMK		Islamic Senior High School	University		PAUD	PKBM	Govt's Office
	Pre-Disaster	Damage	Pre-Disaster	Damage		Pre-Disaster	Damage			
Yogyakarta City	54	16	25	15	4	55	23	17	2	
Sleman Regency	55	12	44	23	10	38	23	10	1	
Bantul Regency	44	36	34	31	5	21	6	40	11	
Kulon Progo Regency	22	4	28	10	1	5	1	4	2	
Gn. Kidul Regency	30	8	22	14	3	3	1	4	5	
Total DIY	**205**	**76**	**153**	**93**	**23**	**122**	**54**	**75**	**21**	
Klaten Regency	44	4	47	6		8				7
Magelang Regency	53		29			8				
Boyolali Regency	50		23			2				
Sukoharjo Regency	28		14			6				
Wonogiri Regency	27		33			2				
Purworejo Regency	30		35			8				
Kebumen Regency	33		48			6				
Temanggung Regency	23		12			3				
Karanganyar Regency	20		21			10				
Total Central Java	308	4	262	6		53				7
Total (DIY and Central Java)	**513**	**80**	**415**	**99**	**23**	**175**	**54**	**75**	**21**	**7**

Source: Media Center of Local Government of DIY, 12 June, 2006
Data of before disaster based on Podes Data 2005

2. Health

Total damages and losses in the health sector in Yogyakarta Province and Central Java Province were extremely high. Total amount of damages was up to IDR. 1.5 trillion, while total losses were estimated up to IDR. 21 billion. The practices of physicians and hospitals were the most parts affected by the impacts with total damages and losses up to IDR. 1 trillion.

The estimated damages in the health sector due to the earthquake was summarized in the table hereunder. The earthquake caused damages and destructions on 17 private hospitals in Yogyakarta city. One public hospital in Klaten Regency, Central Java had minor damages only. In Yogyakarta Province, 41 private clinics were reported being destroyed or damaged and 1,631 practices of private doctors/physicians were exposed by the impacts.

From total 117 Puskesmas (Public Health Center) in Yogyakarta Province, 45 ones were destroyed, 22 ones were seriously damaged and 16 ones were light damaged (table 3.6). In Central Java, 2 puskesmas in Klaten were destroyed or collapsed, seven ones were seriously damaged and seven were light damaged; in Magelang and Boyolali Regency, puskesmas suffered from either light or serious damages. Klaten Regency reported the losses in the form of one mobile puskesmas. From 324 Puskesmas Pembantu (the supporting public health centers) in Yogyakarta, 73 were destroyed, 35 were seriously damaged, and 42 were light damages. In Klaten Regency, Central Java, eight supporting-public health centers were destroyed, 25 were seriously damaged and 19 were light damaged; in Sukoharjo Regency, four supporting-puskesmas were destroyed and one was light damaged. Three *Polindes* [Midwife Posts] were destroyed in Yogyakarta. The worst damages of the major health services for the public (*puskesmas, pustu, polindes,* and the health personnel boarding house) located in Bantul Regency, Gunung Kidul, Sleman, Klaten and Sukoharjo.

Table 3.6. Health Facilities and Infrastructure Conditions by Earthquake

Province	Facilities	Before Earthquake *	Damage Level**				% Damage
			Heavy	Medium	Light	Total	
DI Yogyakarta	Hospital	44	2	1	11	14	32%
	Polyclinic	77	0	0	1	1	1%
	Public Health Center [Puskesmas]	117	45	22	16	83	71%
	Pustu	324	73	35	42	150	46%
	Polindes	27	3	0	3	6	22%
	Officials ' House		87	32	6	125	
	Office	6	2	0	0	2	33%
	UPT	9	2	1	3	6	67%
Central Java	Public Hospital	198	0	1	1	2	1%
	Puskesmas	841	1	6	10	15	2%
	Puskesmas Perawatan		1	5	4	10	
	Pustu	1,824	12	28	30	59	3%
	Mobile Puskesmas	800	1			1	
	Joint Doctors' Practice	38	0	6	2	8	21%
	Officials' House		1	3	2	5	
DIY and Central Java			**16**	**49**	**49**	**100**	

*) Source: Health Profile of DIY and Central Java Province in 2004
**) Source: Head of Sub-Service for Health Planning, Health Service of DIY and Central Java Province

3. Religious and Cultural Affairs

Total damages of religious buildings and properties (Table 3.7) in Yogyakarta and Central Java province were estimated attaining up to IDR. 514 billion, generally private buildings. More than 1,300 people in the community of both provinces no longer had places for praying or doing religious services. In Yogyakarta Province, 2,147 facilities were destroyed or collapsed, which means that it was about 20% of all religious facilities in that province. In regencies attacked by the earthquake in Central Java, 827 facilities were damaged or collapsed which means that it was about 10% of the entire total numbers.

Meanwhile, the damages of cultural buildings and monuments were estimated reaching up to IDR. 140 billion. The losses, in general, were in the form of the losses of income and tourism.

Table 3.7. Physical Damages on Religious Affairs' Facilities (Religious Service House, Religious Affairs Office/Marriage Bureau, Religion Office) in Yogyakarta and Central Java Provinces

Province	Worship House/ KUA/ Service/Office House	Damage Level			Total
		Destroyed	Heavy Damaged	Light Damaged	
Central Java	Mosque and small mosque	316	52	413	781
	Christian/Catholic Church	11	21	8	40
	Vihara				
	Temple				
	Pepanthan				
	Marriage Office	2	4		6
	Office				
	Service House				
	Total	329	77	421	827
DI Yogyakarta	Mosque and small mosque	434	418	1,175	2,027
	Christian/Catholic Church	5	20	39	64
	Vihara		3	9	12
	Temple		3	8	11
	Pepanthan		2	7	9
	Marriage Office	5	11	2	18
	Office			2	2
	Service House		2	2	4
	Total	444	459	1,244	2147
Central Java + DIY	Mosque and small mosque	750	470	1,588	2,808
	Christian/Catholic Church	16	41	47	104
	Vihara		3	9	12
	Temple		3	8	11
	Pepanthan		2	7	9
	Marriage Office	7	15	2	24
	Office			2	2
	Service House		2	2	4
Total Central Java and DIY		**773**	**536**	**1,665**	**2,974**

Source : ATLAS' Earthquake Zone Map, June 27, 2006

4. Social Institution

Total damages and losses for these facilities were estimated reaching up to IDR. 43.6 billion. The amount consisted of the total number of 79 facilities providing the services for 3,428 patients, 67 of those located in Yogyakarta Province and 12 were in Klaten Regency, Central Java. The damages of facilities in Yogyakarta City and surrounding were at the amount of IDR.35.4 billion or more than 81% of total damages and losses.

III.2.4. PRODUCTIVE ECONOMIC SECTOR

Most of minor and middle businesses, shops, traders, and means of livelihood were collapsed. Considering that the spreading damages on residences, the losses in the form of personal assets which were not under insurances they were assumed to be the second largest challenge to rebuild or reconstruct the areas exposed by the disaster impacts. The irrigation structures, the agricultural system, and the fishery sector affected by the impact as well, even though the direct impact in the agriculture seemed to be limited in this stage. The damages and losses suffered by the productive sector entirely were estimated reaching up to IDR. 9,025 trillion. Most of these damages derived from the significant impact of this earthquake on minor/small and middle business, which have been function as the economic back-bone in the areas affected by the disaster impacts.

1. Agriculture and irrigation

The damages and losses in the agricultural sector were estimated up to IDR. 689.3 billion consisting of most parts of infrastructures of irrigations resulting in the potentially failed harvesting reaching up to 90% of this sector and the damages of warehouse and storage facilities.

2. Industry

The entire estimates of damages amounted to more than IDR. 4 trillion excluding the potential damages suffered by three major companies (PT ASA, PT Budi Makmur, and PT Sari Husada), and their damages were quite serious, at the amount as of IDR. 3.8 trillion. Those damages were particularly in the immovable properties (buildings and in some cases, damaged assets like tools), and inventories. The losses anticipated in the future were about IDR. 3.9 trillion. The losses of income were estimated on the basis of the estimates of the decrease of incomes, the loss of opportunities to acquire the income.

3. Trading

The damages suffered by the market and public facilities and modern markets were estimated about IDR 222 billion. The losses were estimated up to IDR 146 billion, so entire damages and losses amounted to IDR 269 billion. Besides, the services sectors including restaurants and non-governmental services also suffered from damages and losses amounting to IDR 218 billion. The entire damages and losses were estimated amounting to 2 % of *PDBR* aggregate in six regencies suffering from the worst impacts.

Table 3.8. Damage Level of Traditional Markets in Yogyakarta and Central Java Provinces

No.	Regency/City	Collapse or Heavy Damage	Light Damage
1	Bantul	15	14
2	Sleman	6	8
3	Yogyakarta	4	9
4	Gunungkidul	3	7
5	Kulon Progo	4	16
6	DIY Province	32	54
7	Klaten	10	
DIY & Central Java		**42**	**54**

Source : ATLAS' Earthquake Zone Map, June 27, 2006

4. Tourism

The estimated losses amounted to IDR 36 billion and the loss of income amounted to approximately IDR 18 billion. Tourism sites which affected by the earthquake impacts located in Yogyakarta Mayor City, Sleman Regency, and Bantul Regency (D.I. Yogyakarta Province) and also Klaten (Central Java). The tourism destinations where being affected by the worst impact of the earthquake were Prambanan Zone and the Burial Plots of Kings at Imogiri, Bantul Regency. At Prambanan, ancient Temple complex and the facilities surrounding such as *Ramayana* theater, the information center and the management office of PT TWC, a state-owned enterprise got the impacts.

The entire damages of the *Prambanan* facilities amounted to IDR 2.835 billion, and the loss due to the decrease of visitors was estimated amounting to IDR 1,151 billion per month. The damage at *Imogiri* ancient Burial Plot was collapsed entirely, and facilities like parking lot, toilets were destroyed as well. The damages of these facilities were estimated up to IDR 400 million. The total amount was relatively small, IDR 390 million/unit. Other damages also took place in the facilities of the government office of the Tourism department of Bantul Regency.

III.2.5. CROSS-SECTOR

1. Financial and Banking Sector

Total damages and losses suffered by banks and *LKNB* were estimated amounting to IDR 1,998 billion. Total damages on the infrastructures and facilities of banking could reach up to IDR 37 billion. An initial estimate of the banks affected by the impact (*BPD, Mandiri Bank and BRI Bank*) showed that the value of total physical damages would reach IDR 15 billion. BPD reported as of IDR 5 billion, Mandiri Bank was as of IDR 2 billion and BRI Bank was as of IDR 7.5 billion. Ten branches of other commercial banks have reported damage.

The estimated damage and loss in the Non-Bank Financial Sector was amounting to Rp. 190 billion. This, in particular, consisted of the micro loan loss of 1,785 micro financial institutions registered in Yogyakarta. Other *LKNB* have reported the potential losses amounting to IDR 50 billion consisting of IDR 45 billion of the business loss value (loan) and IDR 6 billion of the damage value of offices and building facilities.

2. Government, Orderliness and Security and also Judicature

Total damage and loss on the governmental structures and public administrations in D.I. Yogyakarta Province and Central Java Province were estimated reaching up to IDR 137.0 billion. This figure was based on the initial observation in 10 regencies and reflected the estimate of the damage and loss on buildings, tools, personnel, and public archives.

3. Living Environment

The earthquake impact against the environment in a broad outline can be divided into four sectors: a) waste management; b) reconstruction impact; c) environmental infrastructures; d) effect on ecosystem/environmental services. There was no significant damage on the natural ecosystem (forests, coral reefs, mangrove trees, etc.) Due to the earthquake, however, the emerging damage and loss were estimated up to IDR 109.6 billion which were mostly aimed to the costs of clearing and cleaning the ruins.

III.3. ASSESSMENT ON IMPACTS OF DAMAGE AND LOSS

III.3.1 IMPACT ON ECONOMY

Taken from the national point of view, the losses in the economic activities in the areas affected by the impacts probably had minor effects. Prior to the earthquake, the regencies affected by the impacts contributed to the national *PDB* about 2.2%. The worst affected regency was Bantul regency and Klaten regency, which contributed about 0.4%. The major impacts on the national economy probably derived from the costs of the efforts on reconstruction and its implication on the finance of the central government.

The estimated losses in the areas affected by the impacts was as of 5.6% of the entire *PDRB* of the affected areas. By the predicted growth figure as of 5.5%, the net economic growth in the affected areas is decreasing at about 1.3% in 2006 and 4.2% in 2007 (relatively change to *PDRB* projection of pre-earthquake is as of 4.2% for 2006 and -1.3% for 2007). Based on the estimate of the economic loss report, the *PDRB* estimated for the fiscal year 2006 in those areas (Rp. 51 trillion) can be predicted to be decreasing as of Rp. 2.1 trillion. This is insignificant at national level (the predicted or estimated decrease is 0.1% of *PDB*).

Table 3.9. Estimation of Impact on Gross Regional Domestic Product (in trillion Rupiah; 2000 constant price)

Location	Year								
	2000	2001	2002	2003	2004	2005	2006	2007	
Bantul	2.58	2.68	2.80	2.93	3.08	+	--	-	0
Gunung Kidul	2.29	2.37	2.44	2.53	2.61	+	-	0	+
Kulon Progo	1.19	1.23	1.28	1.34	1.40	+	-	0	+
Sleman	3.99	4.17	4.37	4.60	4.84	+	-	-	0
City of Yogyakarta	3.51	3.65	3.81	3.99	4.20	+	-	0	+
D.I Yogyakarta	**117.4**	**127.8**	**140.5**	**152.4**	**165.4**	**+**	**-**	**0**	**+**
Klaten	3.14	3.27	3.39	3.56	3.74	+	--	-	0
Magelang									
Boyolali									
Sukoharjo									
Wonogiri									
Purworejo									
Kebumen									
Temanggung									
Karanganyar									
Central Java	**114,7**	**118,8**	**123,0**	**129,2**	**135,8**	**+**	**0**	**0**	**+**

Source: Regional Statistic Office

Table 3.10. Estimation of Impact on Regional Revenue (in billion rupiah)

Regency/City	Local Revenue	%	Non-Tax Shared Revenue	Tax Revenue	PAF*
Bantul	30.8	5.9%	0.42	19.1	470.85
Gunung Kidul	19.7	4.2%	0.42	14.5	432.87
Kulon Progo	19.8	5.3%	0.43	12.3	344.04
Sleman	60.1	10.3%	0.42	37.0	485.40
City of Yogyakarta	79.9	18.4%	0.42	37.8	316.83
D.I Yogyakarta	**-**	**-**	**-**	**-**	**-**
Klaten	27.05	3.9%	0.58	23.76	635.49
Magelang	-	-	-	-	-
Boyolali	-	-	-	-	-
Sukoharjo	-	-	-	-	-
Wonogiri	-	-	-	-	-
Purworejo	-	-	-	-	-
Kebumen	-	-	-	-	-
Temanggung	-	-	-	-	-
Karanganyar	-	-	-	-	-
Central Java	**-**	**-**	**-**	**-**	**-**

Source: Regional Statistic Office
*) PAF : Public Allocation Fund

III.3.2. IMPACTS ON MANPOWER AND LABOUR AFFAIRS

The initial estimate showed that the decreasing economic activities will result in the loss of about 130,000 job opportunities. This represents approximately 4% of total workers of the pre-earthquake in the areas exposed to the earthquake. As a result, the jobless figure is estimated to be increasing from 7% to 11%.

The services were the worst sector affected by the impacts and resulted in the most parts of total loss of job opportunities (55%). The services sector includes workers in the field of trading that are usually private or entrepreneurs or even represents minor and middle business. Almost 70,000 people lost their main income sources. Agriculture absorbing more than 45% manpower will lose about 1.1% (17,000 occupations) due to the earthquake. The damages of farms and agricultural crops were only minor.

There were as many as 730,000 workers who worked in industries (consisting of construction, plants/manufacturing, utility and mining) in the areas exposed to the earthquake. In Bantul regency itself almost 30% of workers who worked in the licensed companies placing the handicraft sector and any related sectors. Since the majority of these companies constituted small or minor business which frequently had a double function as houses, those of losing occupations and works in a large number in these sub-sectors due to the earthquake were the manufacturing or plant sector.

Table 3.11. Estimated Job Losses by Sector

Regency	Total Manpower	Job Field				
		Agriculture	Trading	Manufacture Industry	Service	Others
Kulonprogo	1,700	500	200	400	500	100
Bantul	32,400	3,400	5,700	11,800	10,000	1,500
Gunung Kidul	2,600	1,300	200	500	500	100
Sleman	27,300	3,100	3,600	9,100	10,500	1,000
Yogyakarta	2,900	-	300	1,200	1,300	100
DIY	**-**	**-**	**-**	**-**	**-**	**-**
Klaten Regency	54,300	6,700	13,100	20,000	12,900	1,600
Magelang Regency	-	-	-	-	-	-
Boyolali Regency	-	-	-	-	-	-
Sukoharjo Regency	-	-	-	-	-	-
Wonogiri Regency	-	-	-	-	-	-
Purworejo Regency	-	-	-	-	-	-
Kebumen Regency	-	-	-	-	-	-
Temanggung Reg.	-	-	-	-	-	-
Karanganyar Reg.	-	-	-	-	-	-
CENTRAL JAVA	-	-	-	-	-	-
Total	**121,200**	**15,000**	**23,100**	**43,000**	**35,700**	**4,400**

Source: Estimated ILO's computation.

Remarks: The blank coloumn as unavailable data

As the multiplier effect of the loss of job opportunities, it was estimated that total number of poor or needy families increased averagely 2% especially in the areas affected by the disaster impacts. According to the data from *Satkorlak* (the Coordinating Unit of Implementers), the increase of the total number of poor families is equal to the total number of residents who passed away and the total number of damaged houses.

Table 3.12. Estimation of Increase in Number of Poor Family

Regency/City	Pre-Disaster			Post-Disaster		
	Total population corresponds with Poverty Map	Total poor people corresponds with Poverty Map	Percentage of poor people (2000)	Total poor people of post-disaster	Absolute increment of poor family	Poor people percentage of post-disaster
Bantul Regency	777,371	242,257	31	266,277	24,020	34.3
Gn. Kidul Regency	668,947	242,201	36	248,907	7,706	37.2
Kulon Progo Reg.	344,476	110,719	32	113,769	3,050	33.0
Sleman Regency	895,358	178,996	20	193,458	14,462	21.6
Yogyakarta City	392,773	40,696	10	44,586	3,890	11.4
Klaten Regency	989,901	222,069	22	236,733	14,664	23.9
	4,068,826	1,036,938	25.5	1,103,730	66,792	27.1

Source: Preliminary Damage and Loss Assessment (Bappenas, June 2006)

CHAPTER IV
POLICIES, PRINCIPLES, AND STRATEGIES FOR REHABILITATION AND RECONSTRUCTION

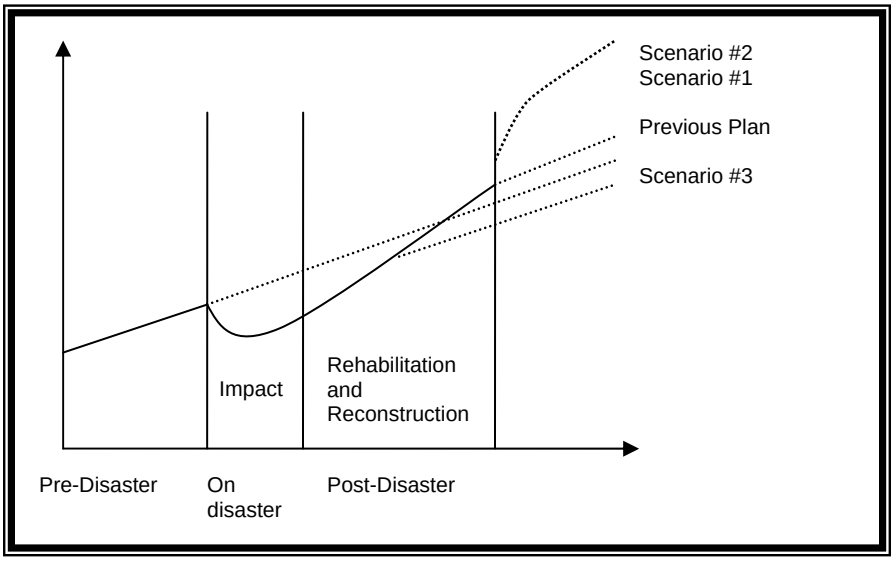
IV.1 GENERAL POLICIES

4.1.1. Scenario of Rehabilitation and Reconstruction

The scenario of post-disaster rehabilitation and reconstruction was made based on the assumption on the availability of resources particularly financing resources, as well as the initial plan prior to the occurrence of the disaster. On the basis of such assumption, then the target of the rehabilitation and reconstruction efforts could be differed into three scenarios, namely:

(1) **Scenario I: Sufficient Financing Resources,** the rehabilitation and reconstruction efforts were expected to be capable of exceeding the minimum service standards of the development, comprising all sectors of damage and loss in the territory and the life of the community affected by the earthquake disaster impacts.

Figure 4.1. Three Scenarios of Rehabilitations and Reconstructions



Source: Bappeda of DI Yogyakarta Province, 27 June 2006

(2) **Scenario II: Excessive or Surplus Financing Resources,** the rehabilitation and reconstruction efforts were expected to be capable of building the territory as a whole, not limited to the sectors of the damage and loss nor limited to the territory and the life of the community affected by the earthquake disaster impacts.

(3) Scenario III: Decreasing or Deficit Financing Resources, the rehabilitation and reconstruction efforts were prioritized on the reconstruction and restoration of housing and rehabilitation of minimum services standards, the reconstruction of educational infrastructures and means, the reconstruction of health infrastructures and means as well as the assistances for the empowerment of minor and middle business in the framework of the community economic development.

4.1.2. General Policy of Rehabilitation and Reconstruction

The evaluation of Damage and Loss Assessment/DLA that has been described in Chapter III categorized the disaster impacts of the earthquake in Yogyakarta and Central Java into 5 (five) sectors, namely: (1) housing and residence sector, (2) infrastructure sector, (3) social sector, (4) economy and production sector, and (5) other sectors (cross-sector). The evaluation components of DLA are as follows:

A. Housing and Residence Sector

B. Infrastructure Sector:

(1) Transportation, (2) Communication, (3) Clean Water and Sanitation, (4) Telecommunication, (5) Energy/Power

C. Social Sector:

(1) Health, (2) Education, (3) Religion, (4) Culture, (5) Social Institutions

D. Economy and Production Sector:

(1) Industry, (2) Trade, (3) Tourism, (4) Agriculture, (5) Fishery, (6) Animal Husbandry, (7) Services

E. Cross-Sector:

(1) Living Environment; (2) Government Order and Structure, (3) Finance and Banking, (4) Orderliness and Security

The abovementioned evaluation result of the damage and loss assessment (DLA) should become the basis for outlining the general policy of the post-disaster rehabilitation and reconstruction in Yogyakarta and Central Java. Yet, DLA would not become the major indications of the estimate of funding need in the action plan made by the government. This was due to the reason that the estimation of DLA was higher than the capability and capacity of the governmental financing, as well as due to the existence of the private sector component calculated in the DLA existing beyond the government's authority.

Meanwhile, the general policy of the post-earthquake disaster rehabilitation and reconstruction of Yogyakarta – Central Java was formulated in accordance with the instruction of the President of the Republic of Indonesia on June 19, 2006 in Yogyakarta. Three stipulated general policies of the rehabilitation and reconstruction were as follows:

1. **Reconstruction of Housing and Residences.** This policy was aimed at providing the housing and residences which were earthquake resistant and healthier, in good order, and more esthetical including their supporting means and infrastructures by considering the aspirations and needs of the community. This

policy was related to the evaluation result of the damage and loss assessment in the sector of housing and residences and also the sector of infrastructures.

2. **Rehabilitation on Public Means and Infrastructures.** This policy had the objectives of rehabilitating the function of the means and infrastructures of the public services, aimed at supporting the revitalization of the local social and economic life. The policy was related to the evaluation result of the damage and loss in the sectors of infrastructures, social, economy and production, and other sectors (cross-sector).

3. **Revitalization of Local and Societal Economy.** This policy was aimed at providing the support in the framework of stimulating and promoting the activity of the local economy and the community's income. The policy was related to the evaluation result of the damage and loss in the economy and production sector and other sectors (cross-sector).

Table 4.1. Linkage of General Recovery Policies and Damage and Loss Assessment Result

Component of Assessment / General Policies		SECTOR				
		Housing	Infrastructure	Social	Production-Economy	Cross-Sector
1.	Recovery on Housing and Settlement	●	●			
2.	Recovery on Public Infrastructure		●	●	●	●
3.	Revitalization of Regional and Social Economy		●	●	●	●

Source: Bappenas, 27 June 2006

4.1.3. Scope of Policies

The scope of the policies on rehabilitation and reconstruction consisted of:

(1) **The reconstruction or repair of various physical infrastructures,** among others the housing and residences, the public infrastructures, and the economic-supporting infrastructures.

(2) **The providing of aids or assistances/stimulation,** in order to support the local and societal economy.

(3) **The support of regulations/policies,** in the form of the revocation of any impeding regulations and the compilation or the drawing up of any regulation which can promote the local economy recovery.

Table 4.2. Scope of Recovery Policies

Assessment DLA / General Policy	SECTOR				
	Housing	Infrastructure	Social	Production-Economy	Cross-Sector
Recovery on Housing and Settlement	Physical rehabilitation for housing and infrastructure-facility of settlement	Physical rehabilitation for electricity, sanitary, and clean water infrastructure			
Recovery on Public Infrastructure		Physical rehabilitation for market, electricity, clean water, sanitary, telecommunication, road, bridge, irrigation, supporting facilities and infrastructures of tourism activities.	Physical rehabilitation for infrastructure of social, National/Cultural Heritage, health, education	Physical rehabilitation for market, irrigation, supporting facilities and infrastructures of tourism activities.	Physical rehabilitation on government's buildings
Revitalization of Regional and Societal Economy				Stimulation on financing and policy in the field of economy and Small, Medium Enterprises	Physical rehabilitation for financial institution

Source: Coordinating Minister for Economic, June 2006

IV.2. BASIC PRINCIPLES

The implementation of the rehabilitation and reconstruction efforts of post-earthquake disaster of Yogyakarta and Central Java shall be performed under the basis principles as follows:

- **It shall be implemented by sustainable development principle,** so that the development activity is necessary to pay attention a long-term impact.
- **It shall be performed in a humanitarian basis, by focusing on the needs of the disaster victims and prioritizing on the existing social pattern.**
- **It shall be performed in a Community Participation Approach**. The rehabilitation and reconstruction activity shall be performed for, by and from the community. The community constitutes the main actor/player of the rehabilitation and reconstruction activity due to being considered as more comprehending the social characters that have been established so far. While the government role either

the central or the local shall be only as a facilitator for the activity conducted by the community.

- **It shall be performed in a comprehensive approach by considering the management of risks.**
- **It shall optimize the local material resources and local human resources.**
- **Utilize natural resources** by prioritizing an efficient spatial allocation principle, minimize pollution, implement a high efficiency pattern in the re-use and recycle of available resources, and utilize new energy as an alternative of energy source.
- **The implementation of development and construction must meet the requirements of the building code, the earthquake resistant building structures with specifications from the Department of Public Works.**
- **It shall be performed by prioritizing on the openness** for all parties through the information supply and services, especially for the community of the disaster victims.
- **There is the process and mechanism of accountability** on the progress, results/outcomes, and benefits either by the government, business world, or society at large.
- **The effective coordination and cooperation among parties at entire levels** and cross-sector in the implementation of rehabilitation and reconstruction.

IV.3. GENERAL STRATEGY OF RECOVERY

The strategy of post-disaster recovery in Yogyakarta and Central Java consisted of two stages, namely the rehabilitation stage and the reconstruction stage. **The Rehabilitation stage** has the character of short-term period, as the response on many urgent issues requiring a prompt and immediate handling and having the objectives of rehabilitating the minimum service standards in the sector of housing, infrastructures, social, economy and production, and other sectors (cross-sector) suffering from the damage and loss due to the disaster impacts. **The Reconstruction Stage** is characterized more of long-term period in order to reconstruct and recover the whole system as well as integrate many development programs into the local development approach.

4.3.1. Reconstruction of Housing and Settlements

Issue on Damage Impact:

1. The loss of residences and home-assets shall increase the figure of **poverty and potential occurrences of social unsafe.**
2. **The potential occurrences of other disasters** such as disease epidemic and health problems in the refugee location, due to being susceptible to environmental sanitation.

Figure 4.2. Private Housing Devastated by the Disaster

Source: Field Survey by Bappenas Team, June 2006

Priority Targets:

1. **Reconstruction of the community's housing and residences,** especially on the housing and residences belong to poor or needy community and other sensitive groups as well as on the zones or territories suffering from the worst damages.
2. **Rehabilitation of the supporting means and infrastructures of housing and residences**, among others clean water services, sanitation and drainage.

Recovery Strategies:

In the Rehabilitation Stage, the repair and reconstruction will be carried out for refugees and the rehabilitation of the environmental infrastructures of the housing will be made in the framework of the minimum service standards. In the Reconstruction Stage, some efforts in the enhancement of service system will be sought for the basic infrastructures of the housing and residence environment. The strategic steps that will be taken by the government in performing the recovery of housing and residences among others are:

1. **To use the rehabilitation and reconstruction of houses as the means of building the community**, in order that the implementation of the construction and development of houses is accurate target and arises no conflict from among communities.
2. To use **the rehabilitation and reconstruction of houses** as the efforts of creating **job opportunities** and building the local economy.
3. To assist the community in constructing the houses with fund stimulant of State Budget in the construction work of earthquake resistant.
4. **To draw up the mechanism of the construction and development of housing and residences** that will be undertaken independently and in a mutual cooperation by the community including the mechanism of the distribution on the construction materials as well as the information system of the development and

construction of housing and residences. The development of housing at the possible way shall not be executed by any third party or contractor.

5. **To formulate periodically** the action priority based upon damage and need scale of susceptible groups and always be responsibe toward the need and priority of community.

6. **To arrange a short-term planning** in the context of zonal development through participatory process of community as well as to stipulate creteria and source of financing for the betterment and reconstruction of housing and settlement.

7. **To optimize the utilization of the existing resources** either from the sides of manpower, skill, organization or financing. Specifically, optimize the utilization of ex-building material from the collapsed or damaged houses and to develop a construction repair which comprises the planning and technical construction, whereas the building material repair comprising the procurement on building material and component managed by community.

8. **To assit the community** a fund stimulant and accompanion so that any kind of house material, they should apply the principle of earthquake resistant.

9. **To stipulate the mechanism and procedures of distributing the Direct Aid for the Community and accelerating the aid distribution** for the reconstruction and repair of the community's housing.

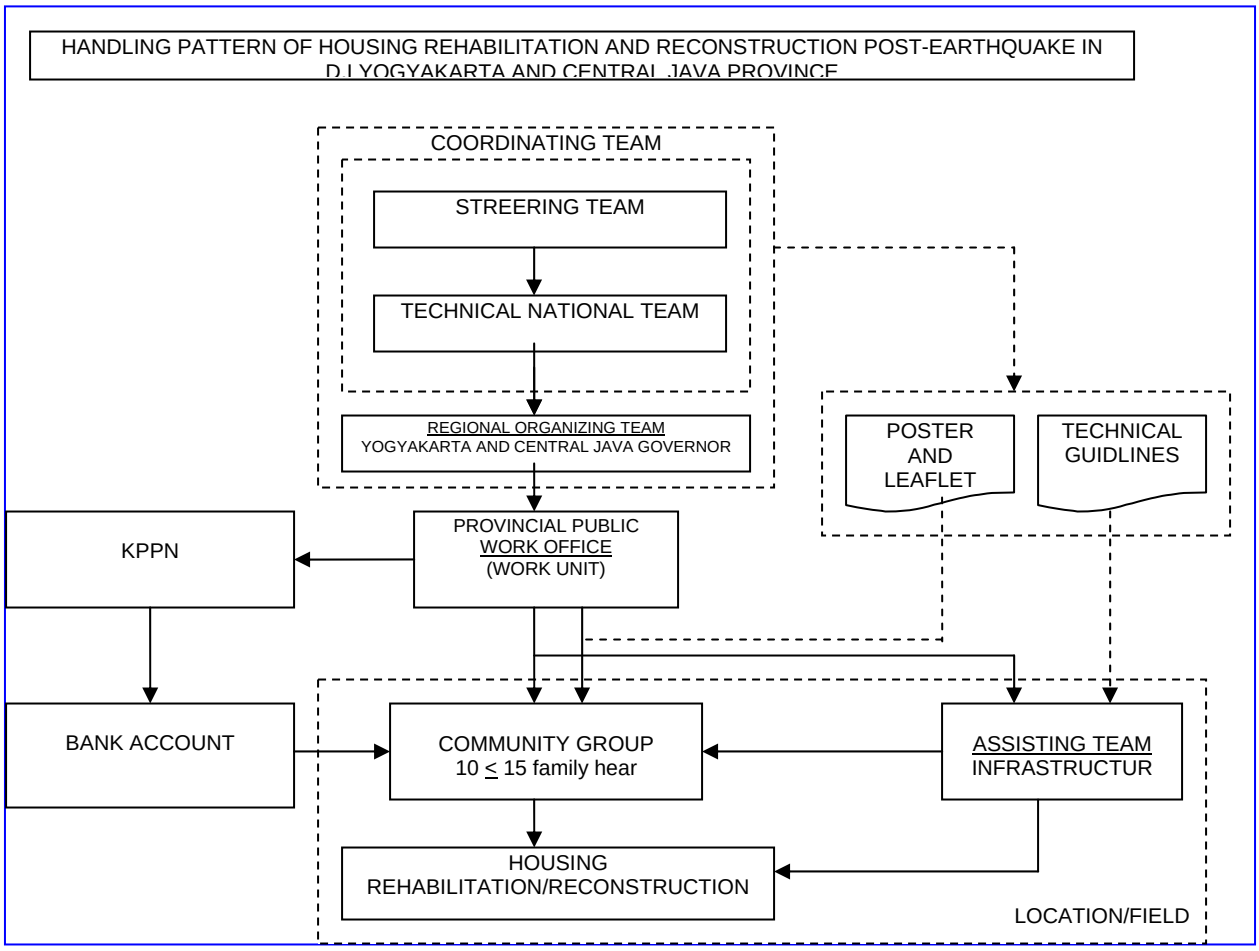
10. **To assist the housing and settlement costruction** that will be carried out by the society with a self-finance and mutual cooperation with various funding alternatives.

11. **Enhancement of capacity and role of municipal and regental government** in facilitating the society in the housing construction through socialization, technical guidance preparation, facilitating consultancy and license process and a series of other activities which can support the house rehabilitation process on the basis of need and intitiative of community.

12. **To prepare surveillance and monitoring system** of housing aid including the surveillance on the basis of community.

13. **To enhance community's capacity,** the information to enhance skill and the informatin to find out the rights, responsibility and option which must be provided clearly transparantly.

Diagram 4.1. Model of Housing Rehabilitation and Reconstruction System



Source: Ministry of Public Works, July 2006

4.3.2 Rehabilitation on Public Infrastructures

Issue on Damage Impact:

1. **The increase of potential children dropping out of school** and the decrease of the educational quality due to the increase of poverty figure and damage on educational means and infrastructures.
2. **The decrease of the health service level for the community** due to the damages on health means and infrastructures.
3. **The decrease of the social service level** for the community of the disaster victim suffering from a psychological trauma and the sensitive and susceptible groups (poor community, females, children, old people, disabled).
4. **The decrease of the traffic flows of capital, information, goods, services and passengers** so it can hamper the economic rate.

5. **The decrease of the availability of energy services** to support the industrial activities.
6. **The decrease of religious activities** due to the damages of religious service infrastructures.
7. **The cultural degradation**, due to the damages of cultural assets having historical values.
8. **The decrease of the service level of law, orderliness and security** due to the damages of law, orderliness and security infrastructures.
9. **The decrease of the level of public services in the government sector** due to the damages of government offices and instruments.

Figure 4.3. Health Services for Disaster Victims

Source: Field Visit by Bappenas Team, June 2006

Priority Targets:

1. **The rehabilitation of educational and health infrastructures for the community.**
2. **The rehabilitation of infrastructures of social services** for the community of the disaster victims and the sensitive community groups (poor people, females, children, old people, and disabled).
3. **The rehabilitation of the economic supporting infrastructures**, among others the supporting infrastructures of agricultures, trading (markets), government, transportation, telecommunication, finance and banking, energy and power, telecommunication infrastructures in order to support the economic revitalization.
4. **The rehabilitation of religious infrastructures and cultural preserve sites/materials.**

5. **The rehabilitation of orderliness, security and judicature infrastructures.**
6. **The rehabilitation of governmental infrastructures.**

Recovery Strategies:

In the Rehabilitation Stage, some efforts will be sought for the function rehabilitation of infrastructures of public services in the framework of the Minimum Service Standards. In the Reconstruction Stage, it is expected that the enhancement of the public service system will be achieved thoroughly as it was formerly. In implementing the recovery of the public infrastructures, the government will take some strategic steps, among others are:

1. **To calculate the need of the required funding** as well as **stipulate the criteria and financing sources** for the repair and reconstruction of the public infrastructures.
2. **To draw up and stipulate the guidelines of the construction of public infrastructures** based on the earthquake resistant construction rules.
3. **To draw up and stipulate the guidelines** of the restoration of historical and archeological articles/stuffs or cultural preserves.
4. **To draw up the distribution regulation and mechanism of construction materials** that will be used in the development of public infrastructures.
5. **To stipulate the mechanism of fund distribution** and **the acceleration of the development of public infrastructures.**

4.3.3. Revitalization of Local Economy and Community

Issues on Damage Impacts:

1. **The increase of the figure of unemployement and the decrease of purchasing power of the community** due to the loss of means of livelihood and the increase of poverty figure/level.
2. **The decrease of tourism visits** due to the damages of tourism supporting facilities and the psychological trauma due to the disaster.
3. **The decrease of production and marketing of home-industry products and small medium industries** due to the damages of production means as well as the impeding conditions to access to productive and market resources.
4. **The obstacles on financial and banking services** for the community.
5. **The decrease of potential revenues on local tax and retribution.**

Priority Targets:

1. **The rehabilitation of activities of production and service sector** having the biggest job opportunity potencies, particularly minor industries, agriculture and tourism.

2. **The rehabilitation of financial and banking institution services** especially reopening the capital access for small/minor and medium business affected by the disaster impacts.
3. **The rehabilitation on market access** for minor and medium business affected by the disaster impacts.
4. **The maintenance and management of natural resources and life environment** in order to anticipate the exploitation on Natural Resources excessively and the damaging acts on the life environment in the territorial redevelopment.
5. **The rehabilitation on security, orderliness and judicature services.**
6. **The rehabilitation for the community survival on foods.**

Recovery Strategies:

The revitalization strategy of regional and societal economy has a long-term character in which some efforts will be sought for creating job opportunities for the community of the disaster victims, the enhancement of the societal and regional economic activity, as well as the target achievement of *PDRB* [Gross Regional Domestic Product]. In implementing the revitalization of the local and societal economy, the government will implement some strategic steps, among others are:

1. **To calculate the need of the required funding** as well as **to stipulate the criteria and financing sources** for the implementation of the revitalization of regional and societal economy.
2. **To draw up the guidelines of providing the business capital aids** for the community of the Small/Minor and Medium Business Group affected by the disaster impacts.
3. **To draw up the guidelines and mechanism of distributing the Direct Aids for the Community** for Small and Medium Business Groups.
4. **To draw up the services institutions of** manpower affairs of post-disaster.
5. **To prepare the supervision and monitoring system** of the distribution of economic aids**.**
6. Stipulate a regulation against the protection of natural resources and life environment.

CHAPTER V
FUNDING, INSTITUTION AND MONITORING THE IMPLEMENTATION OF REHABILITATION AND RECONSTRUCTION

V.1.SCHEME OF FUNDING

Based on the Report of the Estimated Value of the Damage and Loss drawn up jointly by BAPPENAS and the World Bank, the value of damage and loss due to the earthquake disaster on May 27, 2006 in DI Yogyakarta Province and Central Java Province in the sectors of housing, infrastructures, social, productive economy, and cross-sector amounts to Rp. 29.1 trillion.

Considering that there is the fund limitedness for implementing the activity of rehabilitation and reconstruction of post-earthquake in the areas of the Provincial Special Territory of Yogyakarta and Central Java Province, it is necessary to have other financing sources, among others are the financing from the personal sources, private sources and self-supporting sources of the community. The scheme of the financing of rehabilitation and reconstruction is as follows:

Table 5.1. Funding Scheme of Rehabilitations and Reconstructions

	Financing by individual/private/company	Financing by society, private Sectors, SOE, donor with government's aid	Financing by government with self-financing society support	Entirely Financing from Government
Housing and Settlement		Physical Rehabilitation		
Infrastructure		Physical rehabilitation for electricity, clean water, telecommunication, airport and railway	Physical Rehabilitation for market	Rehabilitation for road, bridge, irrigation
Social Sector			Physical Rehabilitation for National/Cultural Heritage, health, education	Physical Rehabilitation for government's building and public facilities
Productive-Economic Sector	Stimulation on financing and policy in the field of economy	Stimulation on financing and policy in the field of SME		

Source : Coordinating Minister for Economic, June 2006.

The need of the financing of rehabilitation and reconstruction for the fiscal year 2006, 2007 and 2008 is further detailed and specified by means of the proposals of activities and financing of the districts/municipal and provincial government affected by the disaster impacts as well as the ministry/institution, and mentioned in:

a. **Attachment I:** The Plan of Detailed Actions of Rehabilitation and Reconstruction of the Provincial Special Territory of Yogyakarta;

b. **Attachment II:** The Plan of Detailed Actions of Rehabilitation and Reconstruction of Central Java Province.

In the compilation of the funding need in the fiscal year 2006, 2007 and 2008, the approach to be used is a *bottom-up* starting from the proposal of the districts/municipal government synchronized to the proposal of the provincial government by the concerned Provincial *Bappeda* (Local Development Planning Agency), and further the proposal of the ministry/institution is consolidated with the reviewed proposal by the concerned Provincial Bappeda. This process is made among others with the purpose of:

a. reducing the potential duplication of activity and financing.

b. analyzing the priority based on the policies of rehabilitation and reconstruction.

The entire processes of the plan compilation of activity and estimate of the funding need are facilitated and coordinated by the Coordinating Team for Rehabilitation and Reconstruction and the Regional Reconstruction of Post-Earthquake Disaster in Provincial Special Region of Yogyakarta and the Province assisted by Bappenas with the objectives among others of:

a. identifying the potencies of the funding sources

b. estimating and assessing the capacity of the fund absorption

V.2. FUNDING SOURCES

Having observed a quite large value of the damage and loss comparing to the extremely limited state financial capacity, then the policy to be made is to use all potencies of the available funding sources efficiently in a broad outline consisting of the government fund sources and the non-governmental fund sources.

1. Government Fund

As a realization of the government's responsibility in the disaster handling, the government allocated the fund for the implementation of Rehabilitation and Reconstruction of the Post-Earthquake Territory in DI Yogyakarta and Central Java Province through the government fund sources consisting of:

a. Rupiah fund;

b. Reallocation or reprogramming of the on-budget foreign loan fund and being administered by the government;

c. Reallocation or reprogramming of the on-budget donation fund and being administered by the government.

In identifying the potential funding sources the efficiency methods on the government budget were taken as follows:

a. Rupiah of APBN [State Budget], Provincial APBD [Regionl Budget] and Regental/Municipal APBD in 2006 was used efficiently and optimally for the activity in the areas affected by the disaster impacts through the reallocation of activity based on the prevailing guidelines and regulations.

b. The amendment budget of APBN, Provincial APBD and Regental/Municipal APBD in 2006 was used efficiently and optimally for the efforts of rehabilitation and reconstruction in the region affected by the disaster impacts at the proportional rate for the sector of housing and residences, the infrastructure sector according to the priority in the territory and the productive economy sector especially the empowerment of small and mediuim enterprises.

c. The government budget (APBN, Provincial APBD and Regental/Municiipal APBD year 2007 and 2008) shall be used efficiently and optimally for the follow-up efforts of the rehabilitation and reconstruction activities in the areas affected by the disaster impacts.

2. Non-Governmental Fund

The potential non-governmental funding sources are from donor countries/institutions either bilaterally or multilaterally, international non-governmental institutions, companies and self-supporting community (*off-budget*). Even though the funding for rehabilitation and reconstruction applied the principle of *on-budget*, but direct donation from the community, donor countries/institutions and the business world require to be facilitated and administered. For the aids from foreign countries, the procedures of administration can be applied in accordance with the Government Regulation No. 2 of 2006 concerning Procedures on the procurement of loan and/or donation fund as well as follow-up of foreign loan and/or donation fund.

Other funding sources derived from the commitment of foreign aids in the donation form are as follows:

Table 5.2. Committed Grants and Aids (indicative)

No	Donor		Total USD (million)	Remarks
1	Australia	AUD	30	Grant for rehabilitation and reconstruction
2	Japan	JPY	890	Grant for the field of education, health, and community development
3	Canada	CAD	8	Grant for rehabilitation and reconstruction
4	Germany	Euro	10	Grant as debt swap, particularly for education
5	ADB	USD	15	USD 10 million are the new grant and its remaining is used for the ongoing PLN .
6	World Bank	USD	65	Reprograming from the existing PLN (included loan from PPK, P2KP, and ILGR)
7	IDB	USD	1	Aid for UIN Yogya, Muhamadiyah and DDII
8	UNDP	USD	28	Grant for early recovery assistance

Source : BAPPENAS, July 25, 2006.

V.3. FUNDING MECHANISM

1. Mechanism of Government Funding

Basically, the mechanism and procedures of the government funding in the framework of the implementation of rehabilitation and reconstruction of post-earthquake in the territory of D.I. Yogyakarta Province and Central Java Province are subject to the standardized mechanism and procedures of funding as set forth in Law Number 17 of 2003 concerning State Finance and Law Number 1 of 2004 concerning Treasury Affairs as well as any implementation regulation related to the intended laws. In the framework of the situation of disaster tackling, steps of accelerating the fund distribution are necessarily required as follows:

a. The acceleration of the administrative completion of budget documents either in the framework of compiling the budget or the budget revision.

b. The acceleration of payment through the Service Office of the State Treasury (SOST).

c. The acceleration of the budget legalization process in the legislative institution.

d. The acceleration of procedures and period off the procurement on governmental goods and services.

2. Mechanism of Non-Governmental Funding

For the off-budget fund distribution in the framework of the financing of rehabilitation and reconstruction activity, the Government of Indonesia has made the policy to shorten the procedures and accelerate the process so that the donation fund can be promptly executed faster with the following steps:

1) After obtaining the estimate of the funding need, based on the Action Plan of rehabilitation and reconstruction, the donors shall draw up the agreement documents, such as: Grant Agreement or Memorandum of Understanding, Exchange of Notes, Concept Note or similar.

2) The activity implementation financed by such donation can be performed directly either by the donor party or managed by the Government of Indonesia.

3) The agreement documents serving as a basis for the activity implementation must be registered at the Department of Finance and is copied to Bappenas and the Secretariat Cabinet.

4) Particularly for the procurement of import goods to get the tax exemption must obtain the permit from the Department of Finance with the recommendation of the State Secretariat.

The track of preparation, approval and implementation of the project/program is stipulated as follows:

1) The project/program proposal is prepared by the donor and submitted to the Government of Indonesia.

2) Bappenas shall evaluate the project/program proposal and give an approval.

3) Trustee shall perform the appraisal.

4) The donation agreement shall be made between a Trustee and the Government of Indonesia

5) The donation collection from the private/community shall be conducted in accordance with the letter of the Minister of Finance No. S-24/MK.06/2005 dated January 18, 2005.

6) In case the donator intends distributing the fund directly to the local community of the areas affected by the disaster impacts, the activity/project to be executed must be consulted with and approved by Bappeda of the Province/Regency/City.

7) Such activity must be in accordance with the Action Plan of Rehabilitation and reconstruction of Post-Earthquake Disaster in the Provincial Special Territory of Yogyakarta and Central Java Province.

V.4. MECHANISM OF FUND DISTRIBUTION

1. *Mechanism of the Direct Aid for the Community for the Construction and Development of Housing*

Based on the consideration of special policies for the development of housing namely in a self-supporting community and mutual cooperation approach, then the principles of the funding mechanism for the development and construction of housing shall be as follows:

a. The funding scheme is the Direct Aid for the Community (DAC) developed for, by and from the community itself.

b. The basic principle of this aid does not constitute the compensation on the damages due to the disaster, but it is to assist the acceleration of the reconstruction of the house conditions and support the fulfillment of the basic needs of houses.

c. The aid of house construction is prioritized for the residence buildings, not buildings rented or leased by the community.

d. The distribution instruments of DAC including the procedures and mechanism of the distribution shall be stipulated by the government.

e. The DAC instruments shall be distributed to any community groups which will reconstruct its respective residence.

f. Any community groups entitling to obtain DAC shall be the member of the group according to the criteria stipulated by the government and has been registered, and has obtained the certificate of the License of Establishing a Building

g. The mechanism of the aid clearing shall be implemented in accordance with the provisions stipulated by the government.

The government facilitates for the implementation of the reconstruction of housing by providing:

a. The organizing of the program implementation of housing and residences in a bottom-up principle to empower the community in the village administrative unit level.

b. The facilitator who gives assistances and technical supervision on house reconstruction, observes the progress of the construction and helps the community in the arrangement of the License of Establishing the Building.

c. Other technical assistance components for socialization, training, onsite supervision, institutional development and technical guidance to the local government and the community in the framework of the community plan integration (micro) and the regency/city development plan (macro).

2. *Mechanism of Construction Funding of Public Infrastructures*

a. The financing scheme is the Direct Aid for the Community (for instance: for development of residence infrastructures, educational infrastructures and others) or implemented by the Third Party according to the applicable regulations.

b. The distribution instruments of DAC including the procedures and mechanism of the distribution shall be stipulated by the government.

c. The DAC instruments shall be distributed to any community groups.

d. Any community groups entitling to obtain DAC shall be the member of the group according to the criteria stipulated by the government and has been registered, and has obtained the certificate of the License of Establishing the Building

3. Mechanism of the Direct Aid for Community on Economic Empowerment

a. The financing scheme is the Direct Aid for the Community (DAC) developed for, by and from the community itself.

b. The distribution instruments of DAC of the economic empowerment including the procedures and mechanism of the distribution shall be stipulated by the government.

c. The DAC instruments shall be distributed to the UKM (the Community Activity Unit), among others for the aids of the procurement of production tools and working capital.

d. In order to distribute the DAC, the government cooperates with any Financial Institutions and Banking.

V.5. ACCELERATION ON PROCUREMENT OF GOVERNMENTAL GOODS AND SERVICES

In the consideration of the quite large scale of construction and material needs, steps are necessarily taken as follows:

1. The government makes the inventory of the sources of basic construction materials namely cement, iron, and wood/timber.

2. The government prepares the steps to facilitate the procurement of local construction materials to insure the availability of the construction materials.

3. The procedures of the procurement acceleration of the governmental goods and services can be conducted with a direct assignment/appointment in a shorter time

by remaining hold on to the principles of a healthy, transparent, open competition and a just treatment for all parties and accountable.

4. The procurement committee comes from the government technical institution as regulated in the Presidential Regulation of the Republic of Indonesia Number 70 of 2005 jo. the Presidential Decree Number 80 of 2003 Concerning Implementation Guidelines of the Procurement of Governmental Goods/Services.
5. The procedures on direct assignment or appointment can be enforceable for the procurement implementation of components of goods and services for the development of houses.
6. The procedures on direct assignment/appointment can be enforceable for the procurement implementation of components of goods and services for the development of public infrastructures in order to accelerate the rehabilitation of services.
7. Any local provider or supplier of goods/services shall have an open and competitive opportunity to take part and compete in implementing the work of rehabilitation and reconstruction.
8. The controlling on procurement of public goods and services for the rehabilitation and reconstruction shall become the responsibility of the working unit head of the local instrument implementing the goods/services procurement.
9. The tax exemption for the procurement of goods and services for the rehabilitation and reconstruction especially for the construction components of housing and public infrastructures.
10. It requires a special treatment through the government regulation in order to support the **housing development/construction** and the development of **public infrastructures** by means of the acceleration of the procurement of governmental goods/services for the handling of post-earthquake disaster in the Provincial Special Territory of Yogyakarta and Central Java Province.

V.6. EXECUTING AGENCY FOR REHABILITATION AND RECONSTRUCTION

In order to direct and coordinate the implementation of rehabilitation and reconstruction, the government shall establish **The Coordinating Team for Territorial Rehabilitation and Reconstruction of Post-Earthquake Disaster in the Provincial Special Territory of Yogyakarta and Central Java Province** consisting of the ***Instructing Team*** and ***the Executive Team*** through the Presidential Decree number 9 of 2006.

The Coordinating Team shall have the duty to coordinate the compilation or the drawing up of the general policy and strategy in the framework of territorial rehabilitation and reconstruction of post-earthquake disaster in the Provincial Special Territory of Yogyakarta and Central Java Province; coordinate the formulation of planning, and undertake the evaluation on the Action Plan of territorial rehabilitation and reconstruction of post-earthquake disaster in the Provincial Special Territory of Yogyakarta and Governor of Central Java Province; and stipulate the strategic steps to overcome the obstacles in the implementation of territorial rehabilitation and

reconstruction of post-earthquake disaster in the Provincial Special Territory of Yogyakarta and Governor of Central Java Province.

The Instructing Team shall have the duty to give instructions in the formulation of the general policy and strategy, in the planning and implementation of territorial rehabilitation and reconstruction of post-earthquake disaster in the Provincial Special Territory of Yogyakarta and Governor of Central Java Province; and stipulate the strategic steps in the framework of coping with the obstacles and constraints of the implementation of territorial rehabilitation and reconstruction of post-earthquake disaster in the Provincial Special Territory of Yogyakarta and Governor of Central Java Province. In its duty performance, the Instructing Team shall be assisted by the National Technical Team.

The Executive Team shall be presided over by the Governor of the Special Territory of Yogyakarta and the Governor of Central Java Province; shall have the duty to formulate the operational strategy and policy of the territorial rehabilitation and reconstruction of post-earthquake disaster in the Provincial Special Territory of Yogyakarta and Governor of Central Java Province; to draw up the detailed plans of acceleration steps of the territorial rehabilitation and reconstruction of post-earthquake disaster in the Provincial Special Territory of Yogyakarta and Governor of Central Java Province; to carry out the rehabilitation and reconstruction in accordance with the general policy of territorial rehabilitation and reconstruction of post-earthquake disaster in the Provincial Special Territory of Yogyakarta and Governor of Central Java Province. The Chairman of the Executive Team shall stipulate the organizational structure, the mechanism and working order in their respective districts, as well as stipulate the Working Unit (Action Unit) for every activity. In its duty performance, the Executive Team shall coordinate with the Secretary of the Instructing Team.

Principally, the rehabilitation and reconstruction program shall be conducted by the Ministry/Institution, the Government in the Provincial Special Territory of Yogyakarta and the Government in Central Java Province. The Provincial government through **an organization/the implementing body** in its district shall make the coordination on the planning and implementation of rehabilitation and reconstruction in its respective territory. In the organizational structure of the implementing body, it shall establish *the Planning and Programming Department, the Housing Department, the Infrastructure Department, the Social Department, the Productive Economy Department, and the Cross-Sector Department* of which activities shall be correlated with the implementation of *the Housing and Residence Program, the Infrastructure Program and the Revitalization Program for Local Economy and Community*. The Secretariat of the Implementing Body shall be established in order to support the smoothness of duties of the organization/the implementing body, the Supervisory Body shall be established in order to ensure that the fund utilization is implemented accountably, free-of-corruption and transparently. The Implementing Organization shall be mandated with the duty among others:

1. To formulate the operational policy and strategy based on the instruction and policy of the Coordinating Team;
2. To draw up the action plan and perform the activity;
3. To manage the implementation of rehabilitation and reconstruction including in managing the existing resources either human or financial resources to perform the rehabilitation and reconstruction;

4. To create and maintain the cooperation with any parties related to the implementation of rehabilitation and reconstruction;

5. To perform the coordination with the Coordinator of Sub-Executive Team in the implementation of the rehabilitation and reconstruction executed by the Ministry/Institution in respective area.

The Organization of the Implementing Body can be established in each province by means of the Decree of the Governor, and shall have the coordinative correlation with the Coordinating Team established by the Central Government. Generally, the duty of each department of the implementing organization in the area shall be as follows:

1. The duty of the planning and programming department can be determined later but in the context of the planning and monitoring as well as controlling of the plan implementation it is necessary to have the coordinative relationship with the planning agency/body at provincial and regental/municipal level.

2. The duty in any departments related to the recovery (rehabilitation and reconstruction) sector can be decided later but in principle, it is necessary to have a coordinative relationship with any institutions of the relevant sector at central, provincial and regental/municipal level.

3. The duty of the secretariat is principally to support the smoothness of the duties of the implementing body and to facilitate the communication between the Implementing Body and the Coordinating Team at central level.

4. The duty of the Supervisory Agency is basically to conduct the supervision and follow up any public complaints in the plan implementation of the rehabilitation and reconstruction as well as have a coordinative relationship with the Financial Supervisory Agency and the Commission for Eradicating Corruptions.

V.7. CONTROLLING ON IMPLEMENTATION OF REHABILITATION AND RECONSTRUCTION

1. Monitoring and Controlling of government finance

The principles of monitoring and controlling shall be implemented based on the following:

a. The Government Regulation no. 8 of 2006 concerning the Reporting of Finance and Work Performance of Government Institutions

b. The Mutual Decree of Finance Minister of the Republic of Indonesia and the State Minister of the National Development Planning/the Head of Bappenas Number: Kep-102/MK.2/2002.

   Number: Kep-292/M.PPN/09/2002

   concerning the System of Monitoring and Controlling of the Development Project Implementation.

The controlling system of government's finance is a process affected by the management created to give a sufficient assurance and certainty in the achievement of effectiveness, efficiency, loyalty on applicable regulations, and the reliability of the representation on the government financial statement. The Governmental Accounting Standards (GAS)

shall be the principles of accounting applied in drawing up and representing the government financial statement.

The work performance shall be the outputs/results of an activity/program that is going to be achieved or has been achieved in connection with the budget utilization under a *standardized quantity and quality*.

2. Reporting on Finance and Work Performance

In the framework of the accountability and responsibility of the implementation of *APBN* and *APBD*, every government unit becomes the accounting entity of the central, local government, the ministry/Institution and the State General Treasury shall be obligated to draw up the Financial Statement and the Report on Work Performance. The Components of the Financial Statement shall be as follows:

a. Report on Budget Realization
b. Balance Sheet
c. Cash Flow Report and
d. Notes on the Financial Statement.

The Report on Work Performance shall contain the summary of the outputs of each activity and the achieved results of respective program as stipulated in the documents of *APBN/APBD*, with the following information:

a. Name of Institution
b. Name of Organization Unit
c. Working Unit
d. Function
e. Sub-Function
f. Program
g. Location
h. Name of Activity
i. Indicator of Work Performance
j. Information on expenditures consisting of budget and its realization
k. Information on Outputs containing plan, realization and unit

3. Monitoring and controlling of plan implementation

In Law No. 25 of 2004 concerning System of National Development Planning, the planning stages consist of 4 (four) activities implemented in a continual and sustainable manner in order to form an integrated planning cycle, namely:

a. Stage of plan compilation
b. Stage of plan determination
c. Stage of plan implementation controlling
d. Stage of plan implementation evaluation.

Eventhough the Action Plan of the Rehabilitation and Reconstruction constitutes a special planning response in the framework of disaster tackling, planning and budgeting

process shall be subject to the effective legislation and regulation so that it is necessary to become the object of monitoring and controlling.

In the context of controlling of ***the plan implementation*** there are 3 (three) stages namely:

a. Stage of monitoring and controlling for the purpose of observing the consistency between planning and implementation

b. Stage of supervision for the purpose of verification/examination, test and evaluation

c. Stage of action for the purpose of clarification, correction and acceleration as the follow-up of the monitoring and supervision results.

The controlling instruments of the plan implementation shall be the Report on Work Performance and the Report on Supervision compiled or drawn up and reported monthly and quarterly by the Working Unit of Organization of budget user to the Instructing Team, Executive Team or the Regent/Mayor according to its authority level.

4. Mechanism of Supervision

The supervision principles are basically aimed at:

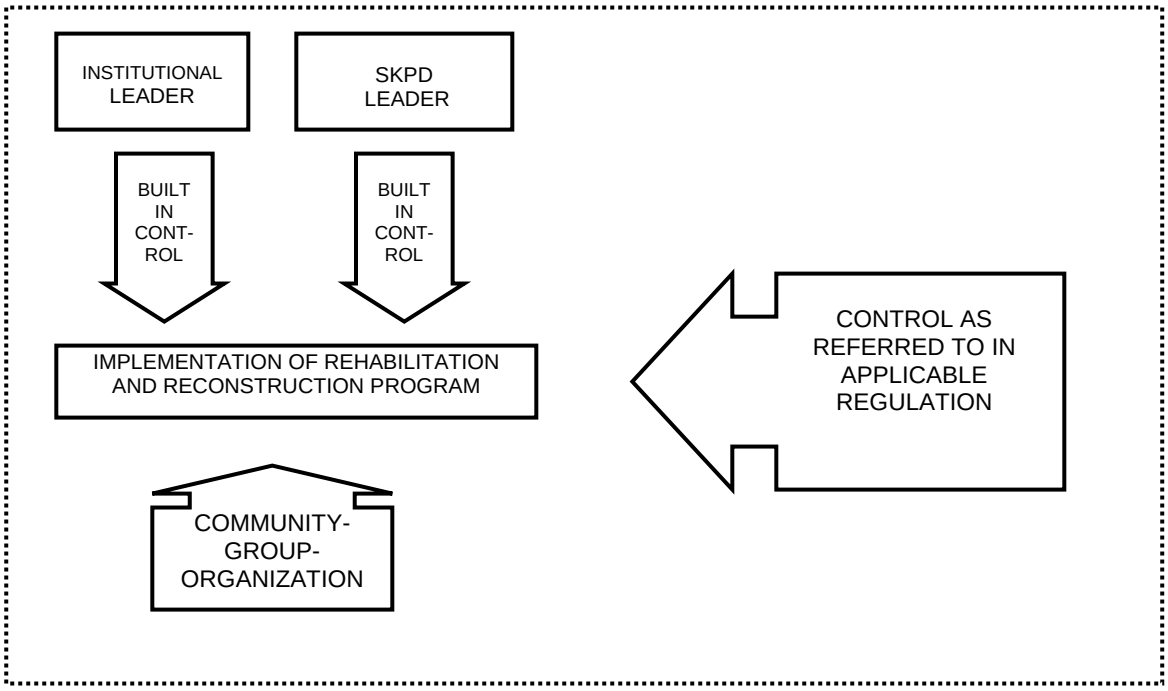
a. Securing/insuring that the program/activity implementation has been in accordance with the stipulated rehabilitation and reconstruction plans.

b. Securing that the implementation of the rehabilitation and reconstruction plans has been in accordance with the prevailing regulation/law.

c. The supervision shall be conducted periodically in accordance with applicable regulations.

d. The community group, private, non-governmenalt institution and university/academy must be given with opportunity to participate in the supervisory mechanism and activity of the plan implementation and planning evaluation in order to give inputs for the compilation of policies in further planning and implementation.

Diagram 5.1. Implementation Control Principles



The Planning Agency at central, provincial and regental/municipal level must get the copy of report on work performance and supervision to conduct an evaluation and submit the evaluation result to the Instructing Team, Executive Team, Regent/Mayor according to its respective authority level.

5. Mechanism of Follow-up for Correction and Adjustment

The principles of follow-up mechanism shall be basically aimed at:

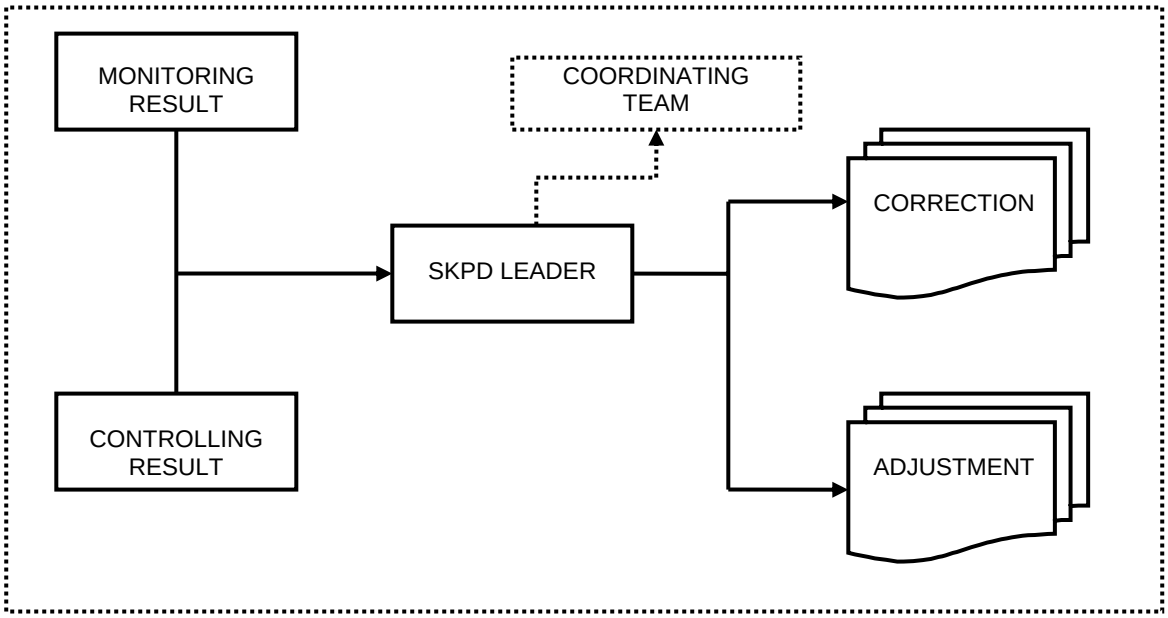
a. making prompt decision and action against *the report on work performance monitoring result* and *the report on supervision result* indicating the existence of obstacles in the plan implementation.

b. The corrective action and adjustment on implementation of the rehabilitation and reconstruction can be conducted through the settlement by the Mayor or Regent, Executive Team or Instructing Team according to the problem scale they deal with and the decision making authority level.

c. In respect of there is a deviation and delay in the implementation of the rehabilitation and reconstruction, the Planning Agency can give a recommendation to the Executive Team or Regent/Mayor according to its respective authority level to postpone or terminate the implementation of development/construction project.

d. In accordance with the effective regulation, the corrective follow-up and the adjustment on the implementation of the rehabilitation and reconstruction shall be carried out quarterly.

Diagram 5.2. Principles and Mechanism of Correction and Adjustment



6. Mechanism of Planning Evaluation

The procedures of the planning evaluation shall be stipulated by the Coordinating Team of territorial rehabilitation and reconstruction of post-earthquake disaster in D.I. Yogyakarta and Governor of Central Java Province according to applicable effective legislation and regulation. In principle, the planning evaluation must provide by the use to evaluate the efficiency, effectiveness, benefits, impacts and sustainability of the program/activity. The main focus on evaluation shall be aimed at the outputs, outcomes and impacts of the implementation of development/construction plan.

In the evaluation some indicators and targets of the work performance are used and consisting of:

a. Input Indicator

b. Output Indicator

c. Outcome Indicator

d. Benefit Indicator

e. Impact Indicator

The principles of the planning evaluation shall be basically aimed at:

a. performing the adjustment on plan and program according to the on-site dynamic situation development.

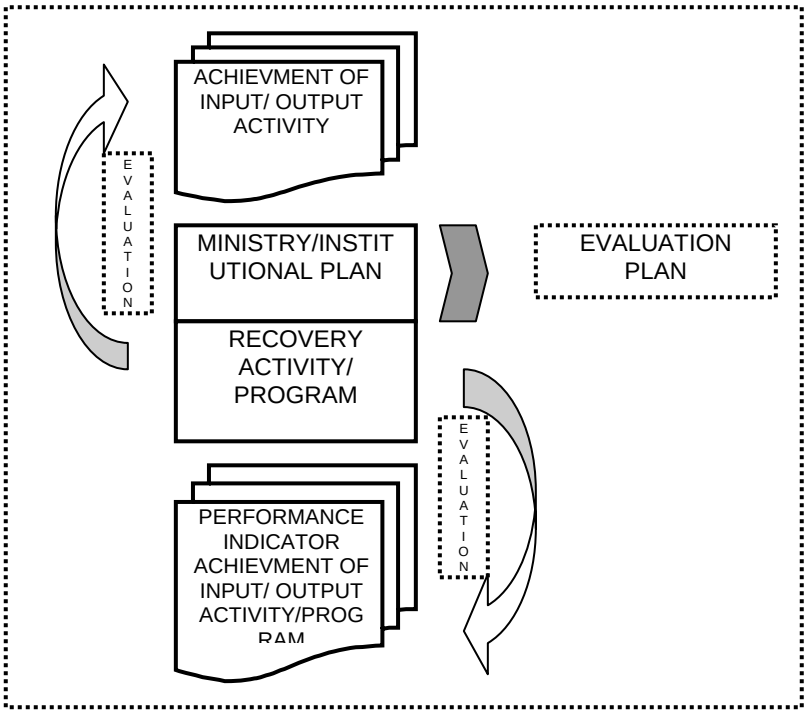
b. the planning evaluation that is executed at *the end of the fiscal year* and *planning year* to analyze the implementation achievement of the rehabilitation and reconstruction.

c. the planning evaluation that is also executed to make a certainty that the rehabilitation and reconstruction activity gives the impact on *economic enhancement of local area and community, the increase of job opportunities* and

poverty decrease in the planning area in particular and throughout the provincial territory in general.

d. the planning evaluation that is executed by the planning agency at central and local level according to its respective authority level.

Diagram 5.3. Planning Evaluation



CHAPTER VI
MITIGATION OF DISASTER RISKS IN THE POST-DISASTER AREAS

The natural disaster constitutes a natural cycle that is unavoidable or unpreventable by human-beings. The issue is that how to make such natural cycle resulted in no occurrence of total immense number of human life victims and losses. The tsunami and earthquake disasters in Indonesia which had caused a huge number of life victims and damages and losses had given a lesson to all parties that how low the community comprehension and understanding was against the efforts of emergency in coping with the threat of such disasters as well as it is necessary to have the preparation and readiness in the mitigation of disaster risks, and in the establishment of early warning system infrastructures.

The community position in the Mitigation of Disaster Risks becomes very important since the community is the subject, object, and also basic source in the best endeavors of reduction on disaster risks. The mitigation plan must adopt and pay attention to local wisdom and traditional knowledge existing and developing in the community. Both aspects constitute the decisive factor in the success of the reduction efforts on disaster risks, considering how high the tradition is and its diversity developing in the Indonesian community especially in the area of D.I. Yogyakarta and Central Java Province.

VI.1. DISASTER RISKS IN YOGYAKARTA AND CENTRAL JAVA

Based on the mapping outcome of the potential disasters in Indonesia (Figure 6.1.), D.I. Yogyakarta and Central Java Province have potencies against the disasters of volcano eruption, earthquake, tsunami, erosion, flood and aridity, due to the geological activity and climate in these areas. Additionally, there are also the potencies against the disease epidemic, particularly when the disaster tackling is too slow and late to be conducted. Initial information on potential disasters is highly needed to draw up further mitigation plan.

1. Volcano Eruption

The central part of Java Island including Yogyakarta Province and Central Java Province, is passed through by the famous volcano belt in the world called *Busur Cincin Api Pasifik* (Pacific Ring Arc of Fire), among others Semeru Volcano, Bromo Volcano, Merapi Volcano.

Matters to be necessarily noticed to reduce the disaster risks of volcano eruption shall be:

a. Layout Order:

- to determine the volcano eruption sensitive level zone in every area being observed from the danger of magma flow, hot mud, hot cloud, and volcanic dust.

- to determine the volcano eruption most sensitive zone as a green area or a residence zone with the low density level especially in the volcano slope and river stream flow deriving from the volcano.
- to determine the location and track for an evacuation.

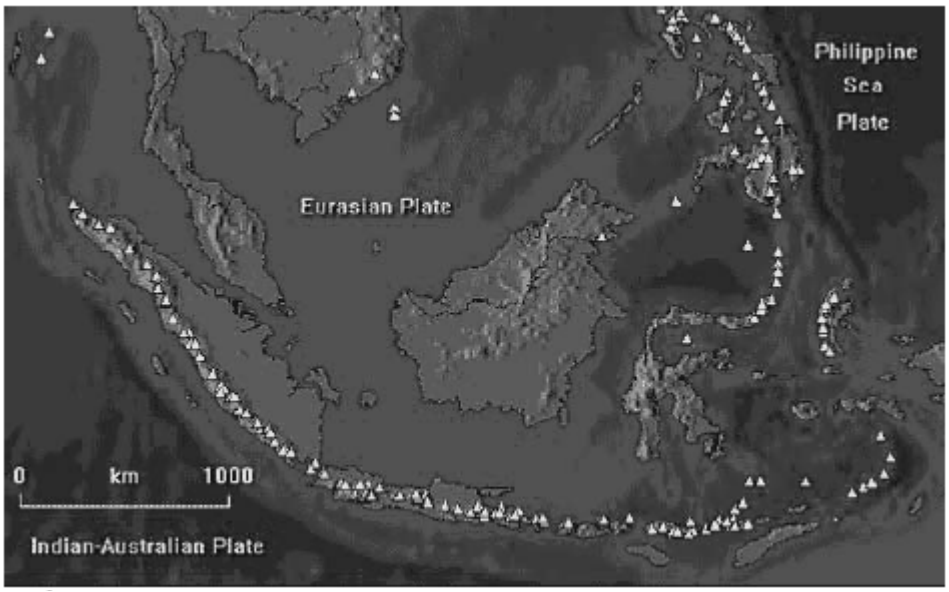
b. Supply and Provision of Means and Infrastructures:

- to enhance the quality of means and infrastructures in order to be sturdy against the disaster of volcano eruption, such as fire proof buildings, and volcanic dust load
- to build the area and track for an evacuation.
- to build a canal alongside the river stream flow deriving from the volcano in order to shift the flows of magma and hot mud.
- to build a water reservoir to restrain the flows of magma and hot mud.

c. Community Empowerment:

- Education and training for the community to become perceptive to the disaster of a volcano eruption like a fire drill.

Figure 6.1. Spread of Volcanoes in Indonesia



Source: www.penataanruang.net

2. Earthquake

Indonesia is the tectonic earthquake most sensitive country due to the existence of two_plate confluence; southern part of Java is an area included in the line passed through by an active fault so there is a possibility of earthquake occurrence.

Matters to be carefully noticed to reduce the earthquake risks shall be:

a. Layout Order:

- to determine the earthquake sensitive level zone in every area from the most sensitive one to the safest one.
- to determine the earthquake most sensitive zone as a green area or a residence zone with the low density level.
- to determine the location and track for an evacuation.

b. Supply and Provision of Means and Infrastructures:

- to enhance the quality of construction pursuant to the quake proof building principle.
- to build the area and track for an evacuation.

Table 6.1. General Stipulations and Conditions of Quake Proof Buildings

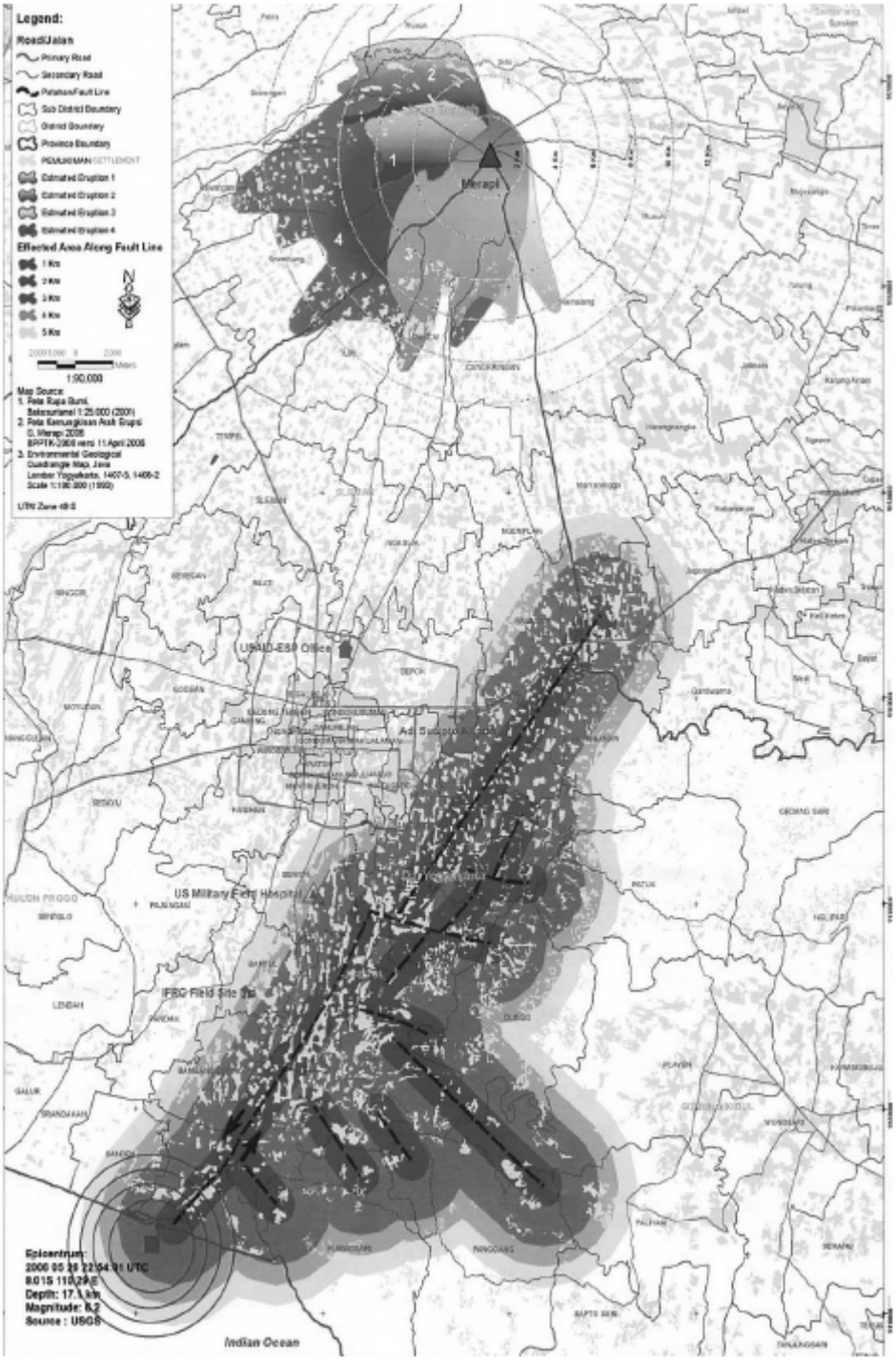
General Stipulations	Conditions of a Building
• Avoid any construction in less stable land or ground like slope and on-shore. Avoid as well any construction in a sandy land in order to prevent from any liquefaction (buildings being lifted up). • Have a symmetrical foundation. • Have a simple and symmetrical sketch or ground plan. • Give a dilatation when the sketch has a L or U shape. • Have a sturdy and strong structure. • Have a strong timbering connection.	• Have continuous reinforced column up to the foundation. • Have a tie of a column and a wall strengthened by anchor. • Use stiff and light wall materials. • Use light roof materials

Source: Department of Public Works

c. Community Empowerment:

- Education and training for the community to become perceptive to disaster of an earthquake like evacuation training, fire drill, first aid, etc.

Figure 6.2. Potencies and Power of an Earthquake in the Special Territory of Yogyakarta Province

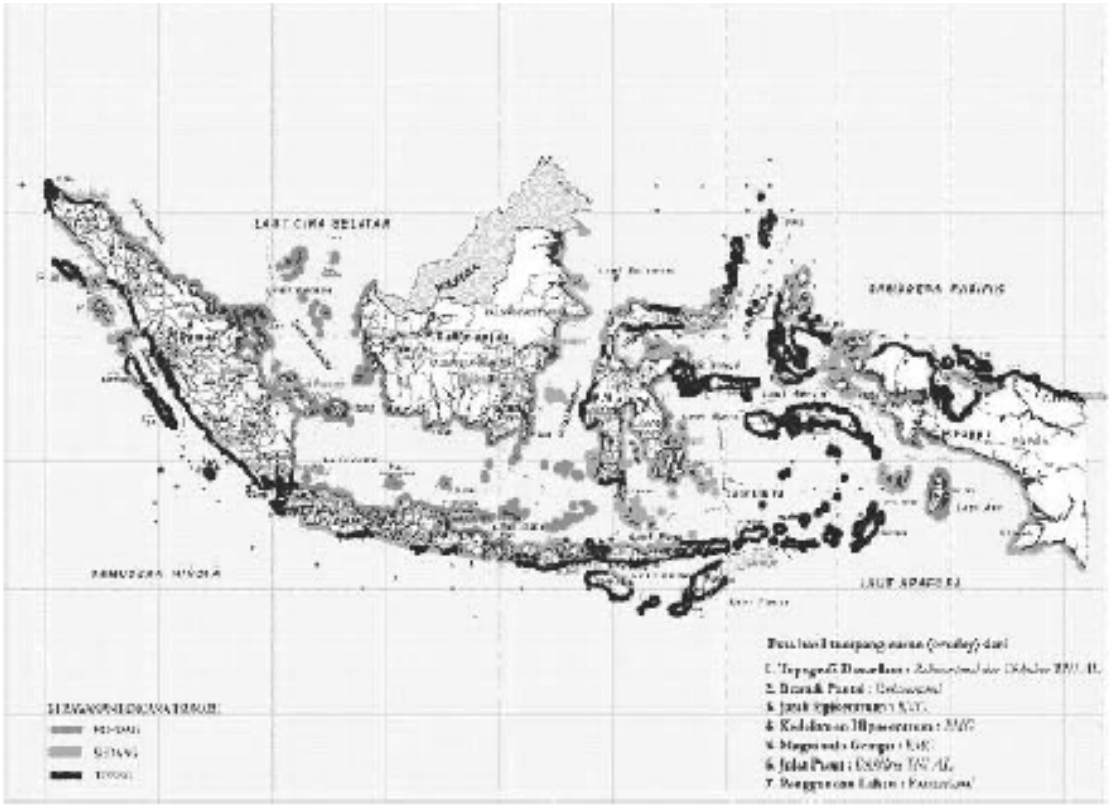


Source: Swisscontact, 2006

3. Tsunami Disaster

Tsunami is a huge and strong seawater wave resulting from the undersea activity like an earthquake, volcano eruption, or erosion undersea, and therefore, the Provincial Special Territory of Yogyakarta and Central Java Province are potential for the tsunami disaster.

Figure 6.3. Map of Vulnerable Areas to be Hit by Tsunami in Indonesia



Source : Bakorsurtanal, 2006.

Matters to be necessarily noticed to reduce the disaster risks of tsunami shall be:

a. Layout and Life Environment Management and Order:

- to determine the tsunami vulnerable level zone in every area from the most vulnerable to the safest one.
- to determine the tsunami most vulnerable zone as a green area or a residence zone with a low density level, namely on-shore border and river stream flow near the sea.
- to determine the location and track for an evacuation.
- to carry out the reforestation on-shore border and alongside the river stream flow to eliminate the wave velocity.

b. Supply and Provision of Means and Infrastructures:

- to enhance the quality and strength of means and infrastructures against the tsunami disaster, like the use of concrete framework in a building, connection reinforcement, building establishment of the house on stilts and others.
- to build the wave breaker and restrainer.
- to build a canal alongside the river stream flow in order to shift the flows of waves and restrain the wave velocity.
- to build the location and track for an evacuation.

4. Landslides

Erosion soil can happen due to an earthquake, high rainfall and flood, volcano activity, and also due to the environment like a denudation in the hill slope or mountain slope, and therefore, the Provincial Special Territory of Yogyakarta and Central Java Province is potential for the erosion disaster.

Matters to be necessarily noticed to reduce the disaster risks of erosion shall be:

a. Layout and Life Environment Management and Order:

- to determine the erosion vulnerable level zone in every area from the most vulnerable to the safest one.
- to determine the erosion most vulnerable zone as a green area or a residence zone with a low density level.
- to determine the location and track for an evacuation.
- to carry out the reforestation in the hill slope or mountain slope.
- to create *terasering* [leveled-paddy field] on hill slopes.

b. Supply and Provision of Means and Infrastructures:

- Not to build permanent buildings on unstable land/ground.
- to build a pile and achor.
- to build a bumper to hold erosion flows.
- to build the location and track for an evacuation.

5. Flood

Flood disaster can happen due to a high rainfall above normal rate, storm waves from tropical storm, bad water channel system and others. From the observation of Bakorsurtanal, Central Java Province is potential for the occurrences of flooded areas like the area in Semarang and surrounding and the area of Cilacap and surrounding.

Matters to be necessarily noticed to reduce the disaster risks of flood shall be:

a. Layout and Life Environment Management and Order:

- to determine the flood vulnerable level zone in every area from the most vulnerable to the safest one.

- to determine the flood most vulnerable zone as a green area or a residence zone with the low density level.
- to determine the location and track for an evacuation.
- to determine the environmental conservation zone.
- to carry out the reforestation alongside the river stream flow.
- to conduct the clearing and cleaning ofthe river stream flows and a canal from garbage and mud sedimentation periodically.

b. Supply and Provision of Means and Infrastructures:

- to build a water reservoir or an artificial lake as a place of collecting and saving water.
- to build a dam to restrain the water flows.
- to build a canal to reduce the water velocity and change/shift the water flows.
- to conduct a dam water arrangement.
- to build the location and track for an evacuation.

6. Aridity

The cause of aridity can be in the form of the climate and the unwise human attitude in the land and water resource management, and also an earthquake resulting in a change of soil water hydrology pattern and water budget. The aridity disaster sensitive area due to an earthquake is apprehensively not in an area suffering from worst physical infrastructure damage, but the surrounding area having the impact which is not really bad. The mitigation activity of the aridity disaster due to an earthquake should be done in the regencies of Bantul, Gunung Kidul, Sleman, Kulonprogo, and Yogyakarta city within the Provincial Special Territory of Yogyakarta as well as in the regencies of Klaten, Sukoharjo, Wonogiri, Purworejo, and Magelang within Central Java Province.

Matters to be necessarily noticed to reduce the disaster risks of aridity shall be:

a. Layout and Life Environment Management and Order:

- to determine the aridity vulnerable level zone in every area from the most sensitive to the safest one.
- to determine the environmental conservation zone.
- to carry out the reforestation or the greening action to hold any damage of soil fertility due to the water and wind flows.
- to use agricultural techniques wisely and in conformity with the land condition.
- to map the structure and pattern of soil water hydrology.
- to measure the water budget.

- to test the water quality with the parameters of pH, temperature, salinity, dissolved oxygen (DO), electric conductivity, color, BOD, COD, TSS, NH_3, PO_4, NO_3, NO_2, As, Hg, Sulfida, Fenol, Cu, Cd, E.Coli and total coliform.

b. Supply and Provision of Means and Infrastructures:

- to build a water reservoir and an artificial lake as a reserve water.

7. Epidemic Disease

The disease epidemic is defined as the emergence of a disease or any occurrence related to the health that is usually broadening and unprecedented and unpredictable. Contagious disease epidemic can derive from parasites, and also due to any other danger like chemical fire, food shortage, unhealthy life pattern, conflict and natural disaster. Based on such causes, all areas are potential for such disease epidemic particularly in the disaster vulnerable areas like the Provincial Special Territory of Yogyakarta and Central Java Province.

Matters to be necessarily noticed to reduce the disaster risks of disease epidemic shall be:

a. Community Empowerment:

- Education, Elucidation and Information Distribution on health and environment cleanliness information.
- Enhancement of awareness and participation of the community in mutually maintaining the health and environment cleanliness.

b. Institution:

- To evaluate the work performance of the health institution and environment cleanliness in conducting the prevention action and disease epidemic tackling.
- To carry out a series of research and development in the framework of prevention and tackling of disease epidemic.

c. Means and Infrastructures:

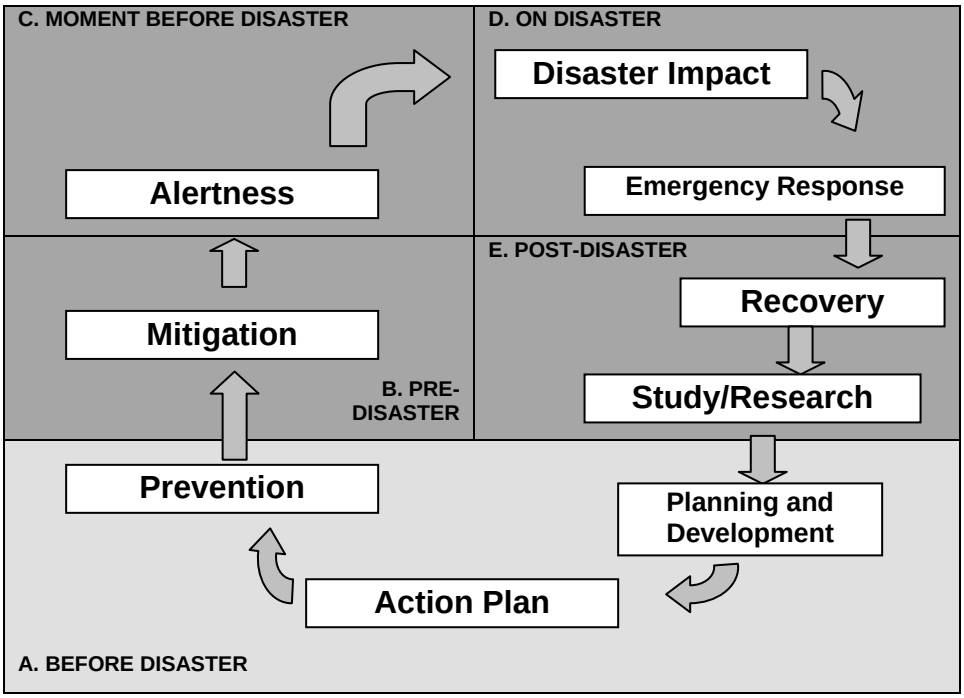
- The supply and provision of means and infrastructures of health and environment cleanliness.
- The procurement of the location and track of an evacuation.

VI.2. DISASTER RISK MITIGATION

Mitigation or a disaster risk reduction is a term used to refer to all actions to reduce the impact of the disaster that can be conducted prior to the disaster occurrence including the readiness and long-term actions for reducing risks. The mitigation of the disaster risks consists of the planning and implementation of actions to reduce the risks related to the dangers due to the human attitude and natural dangers that have been anticipated, as well as the planning process to provide effective responses on the post-disaster tackling.

The efforts of a mitigation shall be implemented by paying attention to the disaster management cycle prior to the disaster occurrence (pre-disaster), at the time of the disaster occurrence (on disaster), and after the disaster occurrence (post-disaster) (Carter, 1992) as illustrated in the following scheme:

Diagram 6.1. Disaster Management Cycles



Source: Carter, 1992

Descriptions:

1. **Mitigation:** is all actions performed prior to the disaster occurrence (pre-disaster actions) comprising the readiness and long-term risk reduction actions. The conducted activity consists of five major fields, namely: construction and engineering, layout planning, economy, institution and management, and community development.
2. **Readiness/Alert:** is activity designed to minimize the damage and loss of life at the approaching time of a disaster, organize the process of evacuations and goods, and facilitate such evacuation activity. The performed activity consists of: the early warning system and evacuations of residents and their assets/properties.
3. **Emergency Responsive,** is effort undertaken promptly at the time of the disaster occurrence in order to tackle or handle the emerging impact. The activity consists of: evacuations of victims/refugees and properties, victim search and rescue, and provision of life assurance (food, medicine, refugee tents)
4. **Recovery,** is the revitalization process of the community's conditions affected by the disaster, by re-functioning the means and infrastructures into the initial condition by conducting the rehabilitation and reconstruction efforts.

5. **Rehabilitation,** is the effort sought for after the disaster occurrence in an immediate/prompt nature or in a short time. The activity to be performed is the repair and rehabilitation of basic/substantial infrastructures such as power grids, clean water, telecommunication, transportation and communication, and economic means.
6. **Reconstruction,** the efforts are taken after the disaster occurrence (post-disaster) which have a middle-term and a long-term nature in order to return the community life into the same condition or even better one than the previous condition before the disaster occurred. The performed activity is the social, economic, and physical repair/construction.
7. **Study/Research,** is a study or research on impacts and volumes resulting from a disaster. The conducted activity consists of: identification of damage elements as well as assessment of loss volume due to such damage.
8. **Planning and Development,** is the compilation of territorial planning and development in a mitigation and disaster handling basis, outlined in the action plan of mitigation and disaster tackling/handling.

6.2.1 Mechanism of Compiling/Drawing Up the of Disaster Risks Mitigation Plan

The mitigation plan and the reduction on risks contain the disaster potencies, the relevant institution having the capacity and authority to cope with the disaster, program, activity and funding source. The mitigation is drawn up as a part of both the long-term and middle-term development outlined into the annual action plan, performed by:

a. Relevant Government and Non-Government Department/Institution adjusted to the mechanism of development planning.

b. Local Government (province/regency/city) preliminarily stipulating the typology/characteristics of the disaster in respective area.

The implementation of the annual action plan shall be conducted by means of the coordination cross-sector and cross-region with the relevant institution both at central and local level, so that requiring strong and firm network among institutions of the central, local government, private, community and other institutions. Steps and synchronization on the action plan drawn up by the Department/LPND and the relevant local government shall be performed by Bappenas, while the supervision, monitoring and evaluation of its implementation shall be performed by Bakornas PB.

6.2.2. Field Scope of Mitigation on Disaster Risks

In general, the activity of mitigation of disaster risks is classified into five major fields, namely:

1. Physical planning
2. Construction and engineering
3. Economy

4. Institution and Management

5. Community empowerment

1. Physical Planning

The physical planning field shall consist of the activity of reviews on disasters and their risks, as well as the layout management in order to avoid any disaster sensitive zones to be used as housing and office areas comprising:

a. To review the disaster risks at local and national level

- To develop, renew, and disseminate the map of risks including any related information to the policy makers and public. The available information is in the form of causes of the disaster occurrence, geographical spreading of the disaster, disaster volume, and disaster frequency.
- To develop the indicator system of the disaster risks and endurance and defense at central and local level assisting the decision makers in reviewing the disaster impact.
- To record, analyze, summarize and disseminate the statistical information on the disaster occurrence, impact and loss.

b. To draw up the territorial layout in a basis of disaster risk reduction

- To compile and create the map of multiplier disaster sensitive in every area being potential for more than one disaster.
- To draw up the territorial layout in a basis of a disaster risk reduction.
- To stipulate the earthquake sensitive level zone in each area from the most vulnerable to the safest one.
- To determine the earthquake most vulnerable zone as a green area or residence with a lower density level.
- To determine the location and track for an evacuation/rescue.

2. Construction and Engineering

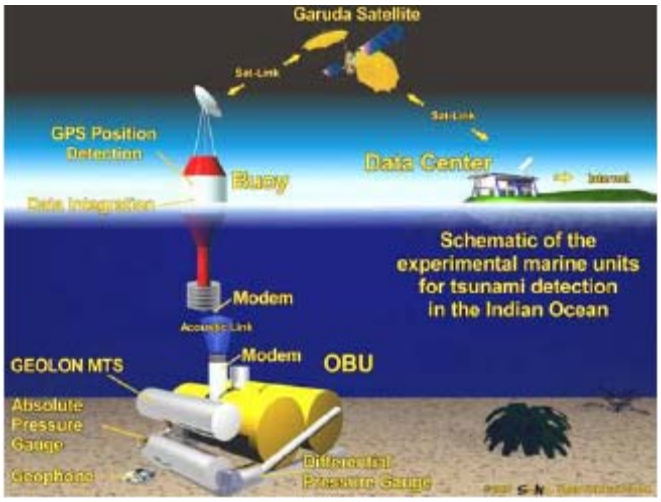
The construction and engineering field consists of the early warning system and the provisions of means and infrastructures which are disaster proof and are required in the mitigation and the disaster risk reduction.

a. The supply and development of the early warning system

- To develop an early warning system either in a basis of a modern technology or a local/traditional wisdom.
- To determine the standards of the early warning system in each type of disasters.
- To draw up the activity guidelines that must be carried out by the community before, approaching in and after the disaster.
- To integrate the early warning system to the information system, the infrastructure system, and the communication system.

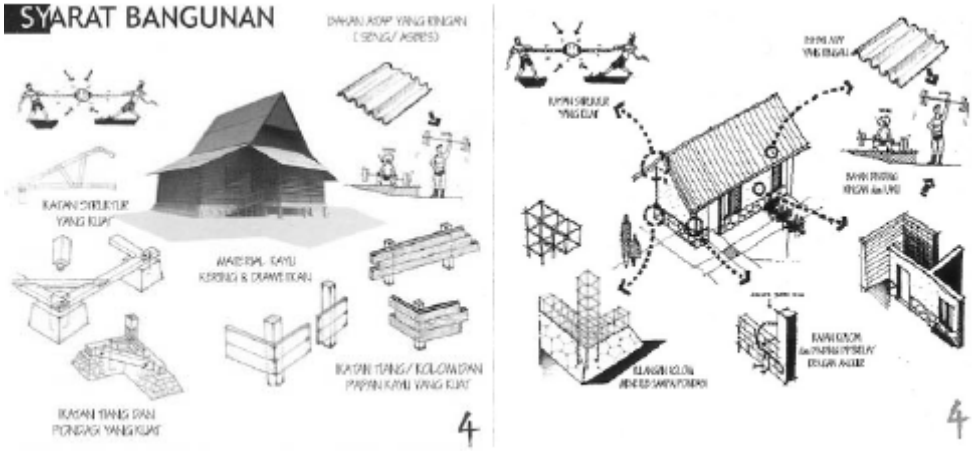
- To perform the capacity reinforcement showing that the early warning system is well-integrated to the government policy and the decision making process.
- To strengthen the coordination and cooperation multi-sector and multi-stakeholder in a chain of the early warning system.
- To develop the research in the technology advance of EWS.

Figure 6.4. Tsunami Early Warning System



Source: www.send.de

Figure 6.5. Earthquake-Resistant Building Code for Concrete and Wooden House



Source: Ministry of Public Works

b. The supply of means and infrastructures functioning for a mitigation and disaster risk reduction

- To stipulate the security standards of the building structure.

- To evaluate the quality and strength of buildings of the existing means and infrastructures particularly public means and infrastructures.
- To develop the technology of means and infrastructures required for the mitigation and the disaster tackling.
- To relocate any existing buildings in the most dangerous zone.
- To evaluate the work performance of the transportation and communication functioning at the time of evacuations and life victim rescue.

c. The layout management/order in a disaster risk reduction basis

- To compile and create the map of multiplier disaster sensitive in every area being potential for more than one disaster.
- To stipulate the earthquake sensitive level zone in each area from the most vulnerable to the safest one.
- To determine the earthquake most vulnerable zone as a green area or a residence with a lower density level.
- To determine the location and track for an evacuation/rescue.

3. Economy

The economy field consists of the mitigation actions assisting the community in assessing and lessening the economic loss due to the disaster.

a. To find out the disaster sensitivity level by estimating the damages which may occur due to the disaster and also evaluate the local capacity in the mitigation and the disaster tackling.

- To identify the damage elements due to the disaster.
- To estimate the loss value due to the disaster.

b. Economic system reinforcement

- To conduct a diversification of economic activities since a sole industrial economy is more vulnerable comparing to an economy consisting of many different activities.
- To strengthen the role of banking institutions and insurance institutions.
- To accommodate the cooperation between the banking institution and insurance institution and the community, local government and business players in the mitigation and the disaster tackling.

4. Institution and Management

The development plan of the mitigation and the disaster risk reduction will be ineffective unless being supported by an efficient and productive institutional system. The activity that is necessarily performed in the framework of the institutional reinforcement shall be:

a. To carry out the mending of coordination track/line among government research institutions and universities. Its objective is to avoid any research program

inefficiency, since they are still performed partially in any relevant institutions and overlapping and becoming unclear/unequivocal since each institution conducts similar research without any control from research and study authorities.

b. To strengthen the policy instruments on an integrated mitigation and disaster tackling inter-sector and inter-region.

- To perform the relevant policy such as a law of life environment and layout management/order in an optimal way and give a sanction for its law breakers/violators.
- To accommodate the activity of the mitigation and disaster tackling into the local government policy especially the territorial layout plan.
- To accommodate the aspirations and interest of the community as well as the traditional/heritage values in drawing up the policy and activity of the mitigation and disaster tackling.

c. To strengthen the institution, either the institution specifically handling the mitigation and disaster tackling or any other relevant/related institutions.

- To establish the group of disaster responsive at local level involving the elements of the chairman of RT/RW, religious prominent figures, traditional figures, community figures, female, teenagers, and security officers.
- To evaluate and enhance the work performance of institutions related directly to the mitigation and disaster tackling, like hospitals, fire department, SAR (Rescue Team) Agencies, and others.
- To strengthen the role of the insurance institutions in the mitigation and disaster tackling.

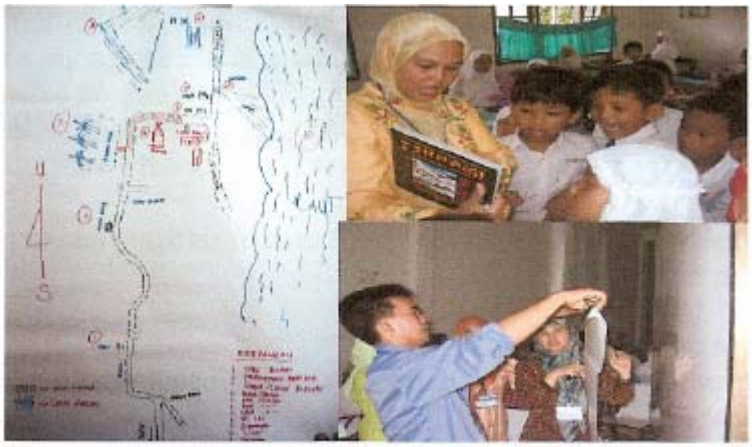
5. Community Empowerment

The community empowerment is highly important in the activity of the mitigation and disaster tackling since the community is the subject, object, and also major source in the efforts of the disaster risk reduction. The mitigation in a community basis constitutes one implementable and cheaper mitigation approach comparing to the large scale-alternative programs. Its objectives is to make the community become capable of organizing itself independently with limited outsourcing technical assistances. This approach tends to maximize the use of local resources including workforce, material and organization.

The community empowerment in the disaster prevention and tackling is performed through a social education for the development of community cultures in order to be more sensitive against any disaster threats. All parties should realize the significance of such community education process. The government should include it into the primary and secondary educational curriculum by providing with detailed explanations on the potencies of an earthquake disaster. The local government located in the sensitive area to an earthquake and other natural disasters should be intensive in performing simulations of evacuation and rescue efforts on a disaster. Also, mass media help in broadcasting the program elucidating the information on the rescue efforts against various disasters and others.

The basic subject of all efforts in such education process is to implant the important knowledge into the community's subconscious so that when any real disasters occur they are ready and know-how the effective way and method to cope with it.

Figure 6.6. Education and Training of the Community



Source: LIPI, 2006

The plan of the community empowerment is conducted by utilizing the knowledge, innovation, and education to build the safety and endurance/defense culture to all levels by means of activities among others:

a. To perform the information management and distribution by means of:

- providing the understandable information on disaster risks and protection choices, particularly to the community of the high risk area.
- strengthening the network of disaster experts, the authority, and the planner inter-sector and inter-region, and drawing up or strengthening the procedures to utilize or exploit the expertise in drawing up the plan of the disaster risk reduction.
- enhancing the dialog and cooperation between scientists and practitioners in the field of the disaster risk reduction.
- increasing the utilization and application of current and latest information, communication and technology in order to support the efforts of the disaster risk reduction.
- Within a middle-term, developing directories, inventories, and information exchange system in a local, national, regional and international scale.
- Providing the information on the construction selection and the information on the land utilization or land purchase-and-sale for any institution related to the city development.
- Renewing and disseminating the international standard terminology on the disaster risk reduction.

- Supplying and providing the information means and infrastructures in order to increase the community access to the formal and non-formal information channels.

b. To enhance the community awareness on a disaster and train the community to avoid and prevent from as well as tackle or handle the disaster:

- to include the knowledge elements of the risk reduction knowledge in the relevant school curriculum.
- to pioneer the implementation of reviews on disaster risks and alertness programs in schools and higher educational institutions.
- to pioneer the program and minimize activity application of disaster impacts in schools.
- to develop training and know-how education programs of disaster risk reduction in certain sectors (development planners, persons in charge of emergency conditions, local governments, and others).
- to pioneer the initiative of community-basis trainings, emphasizing on the rules for volunteers.
- to give access opportunities to trainings and similar education for females and other sensitive constituents.

c. To develop relevant research related to the disaster through:

- developing the cooperation with universities and research institutions in the context of disaster prevention and tackling.
- building advanced methods for the prediction reviews/studies on multi-risk disasters and analysis on cost-benefit socio-economy in the activity of the disaster risk reduction.
- strengthening the technical and scientific capacity to develop and apply the methodology, study or review and model of sensitivity study, as well as geological disaster impact, climate, weather and water.
- strengthening the media role in stimulating the alertness culture against the disaster and the community involvement,

6.2.3 Funding

The funding sources of the plan implementation of the disaster risk reduction are obtained from *APBN*, *APBD*, private aids, and funds from any donor countries/institutions either regionally or internationally. The budget deriving from APBN and APBD is allocated regularly in every fiscal year to insure that the efforts of the disaster risk reduction can run continually and consistently.

Considering the limitedness of the government funding, then the role of the community, private sector, and regional and international donor institution/country becomes the supporting component in the efforts of the mitigation and risk reduction.

6.2.4 Indicators of Success in the Disaster Risk Reduction

The efficiency and success level of the implementation of the disaster risk reduction can be indicated from several aspects among others are:

1. General Aspect

In general, the efficiency and success of the implementation of the disaster risk reduction can be indicated and measured from:

- The increase of total survivals of the disaster occurrence.
- The decrease of total injured life victims due to the disaster.
- The significant percentage of the community affected by the disaster impacts.
- The percentage of the residents of disaster victims that can be calculated in a certain time after the disaster (post-disaster).
- The availability of building and land endurance standards.
- The capacity of the emergency response handling.

2. Aspect of Endurance and Defense against disasters

Being observed from the endurance or defense aspect in coping with a disaster, the success of the disaster risk reduction can be indicated from:

- Distribution of the community income level.
- Educational achievement level.
- Medical service use level.
- Unemployement level.
- Availability and endurance of housing buildings.
- Birth rate and mortality rate in social groups.
- Life quality.
- Life endurance and defense.
- Environment endurance.
- Local economy stamina.

3. Aspect of Territorial Scope

In a national scale, the success of the disaster risk reduction can be shown in the Disaster Risk Index and National Disaster Endurance Index.

- Disaster Risk Index is used to measure the disaster risks in a country comprising the assessments and evaluations on the disaster indicators, physical indicators, and community social-economy stamina.
- National Disaster Endurance Index is used to measure the capacity of the disaster risk management (DRM), institution, awareness and care for disaster risks, funding readiness, and emergency response readiness.

4. Aspect of policies and implementation of disaster risk reduction

The success of efforts of the disaster risk reduction in an area is inseparable from the implementation of policy and implementation of the disaster risk reduction, namely:

- Level of readiness and required time for emergency response.
- Recovery and rehabilitation period and the recovery and rehabilitation efficiency level.
- Loss comparing to the recovery cost.
- Cost volume of the disaster risk reduction system.
- Planning scope and the management of disaster affairs.
- Supply of social supports/social security network program to support the endurance against the disaster.
- Continuity of sources and funding allocations for the disaster management.
- Scope, relevance, and research capability in identifying the disaster, risks and endurance against a disaster.
- Process to review, renew, and maintain the Action Plan of the Disaster Risk Reduction regularly.
- Cooperation network capacity integrating the interests of the government, private, non-governmental institutions, professional associations, and the community.