3.3 Initial Environmental Examination (IEE)

3.3.1 Basis of IEE

EIA process in Indonesia is project-based and the requirement for the conduct of such EIA study is basically determined based on the scale of such a project as noted in Section 2.4. The Indonesian EIA process is initiated once the project location and its scale is concretely determined, preferably early during the feasibility study/basic engineering design of the project concerned.

This disaster mitigation plan is not intended to be either a master plan or a feasibility study of such mitigation projects planned on a realistic sense, since only possible structural measures, in addition to non-structural measures, are identified, and even the locations and scales of the required project facilities of structural measures are not be specifically determined. Accordingly, an initial environmental examination (IEE) [principally focused on the possible project facilities of structural measures considered for the priority areas in Kabupaten Jember (of East Jawa Province) and also for the possible project facilities of structural measures considered in the relevant areas as appropriate in the whole administrative areas of Kabupaten Padang Pariaman and Kota Pariaman (of West Sumatra Province), where the major focus of the disaster mitigation plan is on earthquake and tsunami disaster mitigation measures] was conducted on a preliminary basis based on the JICA Guidelines for Environmental and Social Considerations.

Possible structural measures of disaster mitigation in the priority areas of Kabupaten Jember will be limited to cope with sediment and flood disasters where the priority areas are also divided either as sediment disaster (mitigation) areas or flood disaster areas as described in Section 3.2 (refer to Figure 3.2.6).

On the other hand, possible structural measures for disaster mitigation in Kabupaten Padang Pariaman and Kota Pariaman (both of these areas are geographically contiguous since Kota Pariaman is entirely surrounded by Kabupaten Padang Pariaman) are principally for tsunami as well as flood and sediment disasters as also described in Section 3.2. There is no possible structural disaster mitigation measure for earthquake other than designing of buildings and structures to be resistant to earthquake and strict enforcement of earthquake design codes and standards in the design of structures, which are essentially regarded as nonstructural disaster mitigation measures from the environmental viewpoint.

3.3.2 JICA Guidelines for Environmental and Social Considerations

JICA has its own guidelines for environmental and social considerations, the latest of which became effective in April 2004. According to these guidelines projects are categorized into three groups according to the extent of anticipated environmental and social impacts. The Categorization takes into consideration such factors as nature and outline of the project, scale of

the project, the site location/condition of the project, and the environmental impact assessment scheme in the host country. The categories are as follows:

(1) Category *A*:

A project that is likely to cause significant adverse, complicated, irreversible and unprecedented impacts on the environment and society that is difficult to assess falls into Category A.

Projects requiring a detailed environment impact assessment according to environmental laws and regulations of the recipient governments also belong to Category A. Accordingly, all projects requiring mandatory EIA/AMDAL as per the Decree No.11/2006 by the Minister of State for Environment of the Government of Indonesia (GOI) as dealt with in Section 2.4.2 will also fall under Category A. Moreover, Category A projects include in principle projects in sensitive sectors (i.e., characteristics that are liable to cause adverse environmental impact) and projects located in or near sensitive and ecologically important areas like protected forests and other conservation areas.

(2) Category *B*:

Projects under this category are liable to cause less adverse impacts on the environment and society than Category A projects and are generally site-specific. Most are not irreversible and in general normal and technically well demonstrated (well tested) mitigation measures are adequate.

(3) Category *C*:

These projects are likely to have only minimal or little adverse impacts on the environment and society.

JICA conducts EIA-level environmental and social considerations studies including a monitoring plan, institutional arrangement, and mitigation measures to avoid, minimize or compensate for adverse impacts in line with the TOR and in collaboration with the recipient governments for Category A projects. For Category B projects, in accordance with the TOR, JICA conducts IEE-level environmental and social considerations studies including “without project” condition (zero option).

JICA Guidelines requires that the projects considered must comply with laws and regulations relating to environmental and social considerations established by the governments that have jurisdiction over the project site. Since the Government of Indonesia (GOI) has its own well-established EIA (environmental and social impact assessment) process (and guidelines) as delineated in Section 2.4.2, the possible projects for structural measures of the disaster mitigation plan, during their basic/detailed engineering design stage in future (prior to the commencement of the construction works) will be required to obtain environmental certification following the due processes of GOI (Minister of State for Environment).

3.3.3 Natural and Social Conditions in Pilot Regions

Natural and social conditions in pilot regions are summarized in the table below.

Table 3.3.1 Natural and Social Conditions in Pilot Regions

Item	Kabupaten Jember	Kabupaten Padang Pariaman	Kota Pariaman
Province	East Java	West Sumatra	West Sumatra
Surrounding Area			
North	Kab. Bondowoso	Kab. Agam	Kab. Padang Pariaman (Kec. Sungai Limau, Kec. V Koto Kp. Dalam, Kec. V Koto Timur)
East	Kab. Banyuwangi	Kab. Agam, Kab. Tanah Datar	Kab. Padang Pariaman (Kec. VII Koto Sungai Sarik)
South	Indian Ocean	Kab. Solo, Kota Padang	Kab. Padang Pariaman (Kec. Nan Sabaris, Kec. Ulakan Tapakis)
West	Kab. Lumajang, Kab. Probolinggo	Kota Pariaman, Indian Ocean	Indian Ocean
Number of Kecamatan	31	17	3
Number of Village	247	46	71
Area (land) (km^2)	3,321.94	1,386.00	73.54
Population			
Male	1,099,307	183,926	37,452
Female	1,042,158	200,792	41,306
Total	2,141,465	384,718	78,758
Pop. Density (Person/km^2)	645	278	1,074
Household	557,200	85,496	14,734
Elevation (m)	0-3,328	0-1,425	0-35
Annual Rainfall (mm/year)	About 3,000 (1,000-5,000)	About 4,000 (3,000-5,000)	About 4,000

3.3.4 Environmental Aspects of Disaster Mitigation Plans

1) Disaster mitigation plan for Kabupaten Jember

The principal objective of the disaster mitigation plan for Kabupaten Jember is to establish a plan to cope with both sediment and flood disasters in the identified priority areas that is composed of both structural and non-structural measures. There are multiple project components as possible measures for both structural and nonstructural measures as described in Section 3.2. So it is not that meaningful and impractical to consider numerous alternative project combinations for comparative environmental evaluation at this planning stage. Accordingly, three compact

alternative plans are selected for comparative environmental and social evaluation of the sediment and flood disaster mitigation plan.

The three alternative plans are as follows:

1. Implementation of comprehensive sediment and flood disaster mitigation plan
2. Implementation of only the non-structural measures of the comprehensive sediment and flood disaster mitigation plan (Structurally zero option)
3. No implementation of the entire comprehensive sediment and flood disaster mitigation plan (Absolute zero option)

(1) Implementation of comprehensive sediment and flood disaster mitigation plan

The comprehensive sediment and flood mitigation plan covers 4 distinct priority areas of Kabupaten Jember, 2 each for sediment (S1 and S2 areas) and flood (F1 and F2 areas) disaster mitigation. A variety of structural and non-structural measures are possible in all 4 of these priority areas as given in Table 3.2.13 (sediment disaster mitigation measures for S1 and S2 areas) and Table 3.2.2 (flood disaster mitigation measures for F1 and F2 areas). Also refer to Figure 3.2.6 for the location of these 4 priority areas.

Possible structural measures of both sediment and flood disaster mitigation does not include potential large-scale civil engineering facilities like sabo dams or flood control dams that in an overall sense should be regarded as small-scale facilities such as retaining wall, reinforcement of dike and revetment works. Accordingly, potential adverse environmental and social effects due to the provision of these well-known and much used facilities are also regarded as easily manageable.

On the other hand, the potential long-term social and environmental beneficial effects of these sediment and flood disaster mitigation measures (composed of both structural and non-structural measures that included ecologically beneficial reforestation as a very significant component of non-structural measure wherever applicable) are obvious and include stabilization of life of potentially affected people and their economic and social activities and also the protection of their living environment.

In fact reforestation is already well in progress in various deforested lands of Kabupaten Jember that included even some portions of the protected national forest reserve areas like the ecologically very significant Meru Betiri National Park (largest national park of Kabupaten Jember with an area of about 372 km^2 located along its south eastern part). Community oriented reforestation/tree plantation work is promoted and coordinated by the Department of Sanitation and Living Environment*/Dinas Kebersihan dan Lingkungan Hidup* (DKLH), while relatively large-scale reforestation in forestry areas (including the protected forest areas) is carried out by the Department of Forestry and Plantation/*Dinas Kehutanan dan Perkebunan (Dishutbun)* of

Kabupaten Jember. (Refer to Environmental Status of Kabupaten Jember in the year 2006, which is in fact published annually by DKLH of Kabupaten Jember.) Also according to this Environmental Status Year Book (2006) of Kabupaten Jember, this Meru Betiri National Park is a very important habitat for a variety of fauna and flora that includes rare and endangered species as well. It is noted that illegal logging has been the major cause of deforestation that prevailed in Indonesia (including Kabupaten Jember) mostly during the political turmoil years of 1998-2002.

Finally, based on the above aspects, and overall, the possible comprehensive sediment and flood disaster mitigation measures composed of both structural and non-structural measures is considered to be of Category B as per the JICA Guidelines for Environmental and Social Considerations with most of the project facilities of structural measures, being of small-scale, that might not requiring detailed AMDAL/EIA Studies during their implementation in future.

Still, according to the AMDAL process of Indonesia, a project is subject to mandatory AMDAL/EIA study principally based on its scale as specified by the Decree No. 11/2006, which is updated at least once in every 5 years as noted in Section 2.4.2. Some of these structural measure projects at the time of their implementation might be subject to mandatory EIA/AMDAL as their scale is at least marginally larger to fall into such category as per the relevant Decree effective at that time. In such case, the relevant project would be considered as Category A subjected to detailed AMDAL/EIA Study, even though overall the possible structural measures for all 4 priority areas (S1, S2, F1 and F2) are considered as Category B.

In this respect it is further noted that location-wise, none of these 4 priority areas is expected to encroach into any of the protected nature reserve areas of Kabupaten Jember. In principle, no structural disaster mitigation measures will be implemented in a protected/nature reserve area. Reforestation to restore the affected forest ecological environment to its original state to the extent possible shall be the most significant non-structural disaster mitigation measure for such a protected/nature reserve area, in particular in the ecologically significant Meru Betiri National Park. Such restoration of forest ecosystem to its original state would involve reforestation using a variety of native flora species of non-monolithic nature.

In fact, even in case of any encroachment of any of these priority areas into a protected forest area, still the overall sediment and flood mitigation plan is applicable with the valid project option in and around such a protected area being limited to the nonstructural measure of reforestation only.

Finally scoping for the comprehensive disaster mitigation plan, formulated on a preliminary basis is given in Table 3.3.2.

(2) Implementation of non-structural measures only (Structurally zero option)

The proposed non-structural measures of sediment and flood disaster mitigation as shown in Tables 3.2.13 and 3.2.2, other than for reforestation and land use limitation (that include

existing/remaining forestry protection) are basically composed of early warning system, evacuation route and shelters as well as measures through community activities to enhance community awareness on potential natural disasters.

These early warning oriented non-structural measures in general are very economical, easy and quick to implement, and very important to save human lives and hence shall take precedence in the implementation of the disaster mitigation plan. In reality, no structural mitigation measure could ensure absolute protection against all scales of sediment and flood disasters. Thus, prompt evacuation to save human lives will always remain as the ultimate (last resort) action plan to cope with natural disasters.

On the other hand, these warning and evacuation oriented non-structural measures in themselves will not prevent the economic, social and environmental damage inherent to such sediment and flood disasters. In essence these non-structural measures could neither directly prevent the occurrence of such disasters nor mitigate their adverse social and environmental effects including disruption in life of the affected people. Damage to social and related living environmental infrastructures, in particular when the frequency of occurrence of such sediment and flood disaster is high, is definitely an obstruction to leading a normal peaceful life, and therefore it is very rational to consider additional structural measures to directly cope with sediment and flood disasters to a certain extent.

Accordingly, simple structural measures, in combination with non-structural measures, are also incorporated as possible means to mitigate sediment and flood disasters in the 4 priority areas. These structural measures are also determined withproper consideration to the economic condition and budgetary limitation of Kabupaten Jember.

Based on the above considerations, it is concluded that total reliance on non-structural disaster mitigation measures is irrational although implementation of non-structural measures shall take precedence over structural-measures. Accordingly, structurally zero option, although most economical in particular when the cost of restoration following a disaster is not taken into account, alone is regarded as inadequate (necessary but not sufficient) to effectively mitigate sediment and flood disasters.

(3) Do nothing option (Absolute zero option)

Making absolutely no effort to mitigate sediment and flood disasters, although definitely a viable option, is against the progressive sprit of human nature and hence regarded as totally irrational and requires no further consideration.

Table 3.3.2 Scoping for Comprehensive Disaster Mitigation Plan

(For All 4 Priority Areas of S1, S2, F1 and F2 of Kabupaten Jember)

No	Item	Grade*	Reason
Social Environment			
1.	Involuntary Resettlement	B	The possible structural measures such as retaining wall, reinforcement of dike and revetment works are of small-scale and hence not expected to involve large number of resettlement. However, the possibility of resettlement for a small limited number of people depending on the status of housing during the actual time of implementation of a project facility like embankment/dike might become inevitable.
2.	Local economy such as employment and livelihood, etc.	C	Although the construction works like revetment works by generating employment opportunity to local people is expected to be beneficial to local economy, still any involuntary resettlement and impeded access due to construction works have the potential to affect livelihood of local people.
3.	Land use and utilization of local resources	C	The possible project of structural measures such as retaining wall, reinforcement of dike and revetment works do not require extensive resources for their realization and local resources should be mostly adequate considering the potential small-scale of the projects. Reforestation and land-use control as non-structural measures would be beneficial for conserved land-use.
4.	Social institutions such as social infrastructure and local decision-making institutions	C	The possible activities to be implemented under the plan are not expected to significantly influence directly social infrastructure and local decision-making institutions. However, some short-term impediment to prompt access to social institutions might result due to construction activities.
5.	Existing social infrastructures and services	C	The possible activities to be implemented under the plan are not expected to significantly influence existing social infrastructure. However, some short-term impediment to prompt access to social services might result due to construction activities.
6.	The poor, indigenous and ethnic people	C	Involuntary resettlement, though not expected to be large-scale, if not conducted on a fair manner, have the potential to affect disproportionately the poor.
7.	Misdistribution of benefit and damage	C	Lack of fair compensation during any involuntary resettlement and lack of consideration to employ local work force to the extent possible have the potential to result in misdistribution of benefit.
8.	Cultural heritage	C	The project plan is not expected to affect any cultural heritage. Still, this has to be confirmed during the implementation of projects.
9.	Local conflict of interests	C	Inadequate compensation during involuntary resettlement and lack of consideration to hire local work force as per Item 7 of above have potential to lead to local conflict of interest.
10.	Water Usage or Water Rights and Rights of Common	C	Construction of flood mitigation facilities like dikes may affect water rights at local level, which have to be given due consideration in the design of such facilities.
11.	Sanitation	D	Disaster mitigation in the long-term will lead to improved sanitation and also will facilitate the provision of improved sanitation services.
12.	Hazards (Risk) Infectious diseases such as HIV/AIDS	D	The facilities of the plan such as retaining wall and revetment are of small-scale and do not require any large scale external labor for its implementation. Accordingly, potential risk of transmission of infectious diseases is regarded as insignificant.

No	Item	Grade*	Reason
13.	Gender	D	Since traditionally women share high household work burden they have higher potential to be affected disproportionately during natural disasters and its consequence like evacuation to temporary shelters. Accordingly, disaster mitigation plan is regarded to be at most beneficial.
Natural Environment			
14.	Topography and Geographical features	D	The structural measures such as retaining wall, reinforcement of dike and revetment works are of small-scale to cause any significant effects on these features.
15.	Soil Erosion	C	During the construction works like revetment works effective mitigation measures against potential soil erosion need to be considered. In the long-term the disaster mitigation measures such as slope protection and hillside works also will result in soil erosion control (long-term beneficial effect)
16.	Ground Water	D	All project activities are basically concerned to ground surface and surface water environment and have no significant effect on groundwater extraction or its quality.
17.	Hydrological Situation	D	The structural measures such as reinforcement of dike and revetment works are of small-scale to cause any significant effects on hydrology..
18.	Coastal Zone	D	Structural flood mitigation facilities such as dike and revetment for F2 area might cause some adverse effects on coastal zone, though potential for significant adverse effects is considered insignificant in consideration to the small-scale of the facilities.
19.	Flora, Fauna and Biodiversity	C	Existence of any rare or endangered flora or fauna and relevant potential adverse effects and the required protection measures need to be considered during the implementation of projects.
20.	Meteorology	D	There are no activities that may affect the meteorology.
21.	Landscape	D	The structural measures such as retaining wall, reinforcement of dike and revetment works are of small-scale to cause any significant adverse effects including visual impact on landscape.
22.	Global Warming	D	There are no activities with constant emission of green house substances. In fact reforestation would contribute to at least long-term marginal reduction in global warming potential, marginal beneficial effect.
Pollution			
23.	Air Pollution	C	Construction works like retaining wall may cause some short-term air quality deterioration especially due to dispersion of dust. However, this could be controlled with appropriate mitigation measures like water spraying.
24.	Water Pollution	C	Construction works along rivers would cause short-term deterioration in water quality due to increased turbidity in particular consequent to the disturbance of riverbank and riverbed areas during channel widening and deepening works.
25.	Soil Contamination	D	There are no activities necessitating the use of toxic materials that may lead to soil contamination.
26.	Waste	C	Construction wastes including surplus soil will be generated that has to be managed appropriately focused on reuse of the wastes as much as possible.
27.	Noise and Vibration	C	Construction works such as retaining wall and revetment works have potential to generate short-term noise and vibration. This has to be managed appropriately in particular when such work is carried out near residential areas.

No	Item	Grade*	Reason
28.	Ground Subsidence	D	There are no activities requiring significant extraction of groundwater the only major cause of any potential ground subsidence as also noted under Item 16 above.
29.	Offensive Odor	D	There are no activities that may result in the generation of significant offensive odor.
30.	Bottom sediment	C	Channel deepening works have the potential to disturb bottom sediments, a short-term adverse effect.
31.	Accidents	C	Accidents may occur in any construction work, basically a short-term occupational health and safety issue limited to the period of construction works. Still, the probability of the occurrence of serious accident is rather low since the constructed facilities such as retaining wall and revetment are of small-scale.

*Grade of evaluation: A: Significant negative impact expected

B: Considerable negative impact expected

C: Extent of impact in unknown

D: No or negligible negative impact (also including mostly beneficial effects)

2) Disaster mitigation plan for Kabupaten Padang Pariaman and Kota Pariaman

The most significant aspect of Kabupaten Padang Pariaman and Kota Pariaman is that the region is earthquake prone and hence also tsunami disaster prone since the area is also located along the west coast of Sumatra Island with a total coastline length of about 75 km. Accordingly, the principal focus of the disaster mitigation plan is on earthquake and tsunami disasters (for coastal areas) supplemented with flood and sediment disasters. The comprehensive disaster mitigation measures are composed of both structural and nonstructural measures as dealt with in Section 3.2. Still, from an environmental viewpoint, design of structures and buildings to be resistant to earthquake and also to withstand tsunami waves (for buildings located near coast) are regarded as nonstructural measures since this essentially involves design criteria and standards to be adhered in the design of buildings located in such disaster prone areas.

There are a variety of disaster mitigation measures composed of both structural and nonstructural measures essentially covering the whole area of Kabupaten Padang Pariaman and Kota Pariaman (The possible disaster mitigation measures are identified principally based on the basis of relevant Kecamatans for both Kabupaten Padang Pariaman and Kota Pariaman in Section 3.2) to cope with earthquake (only nonstructural measures), tsunami (principally focused on nonstructural measures), flood and sediment disasters. So, similar to the case of Kabupaten Jember, it is not that meaningful and also impractical to consider such numerous alternative project combinations for comparative environmental evaluation at this planning stage. Accordingly, three compact alternative plans (as in the case for Kabupaten Jember as dealt with above under Item 1)) are selected for comparative environmental and social evaluation of the comprehensive disaster mitigation plan.

The three alternative plans are as follows:

1. Implementation of comprehensive disaster mitigation plan
2. Implementation of only the non-structural measures of the comprehensive disaster mitigation plan (Structurally zero option)
3. No implementation of the entire comprehensive disaster mitigation plan (Absolute zero option)

(1) Implementation of comprehensive disaster mitigation plan

The comprehensive mitigation plan composed of earthquake, tsunami, flood and sediment disaster mitigation measures basically covers the relevant areas all the administrative areas of both Kabupaten Padang Pariaman and Kota Pariaman (Refer to Section 3.2). Overall, a variety of structural and non-structural measures are possible as disaster mitigation measures. However, the disaster mitigation measures for earthquake will be basically nonstructural in the form of enforcement of earthquake resistant structural design codes and standards, initially at least focused on the design of public facilities.

The significant and only possible structural measures for tsunami (for coastal areas of both Kabupaten Padang Pariaman and Kota Pariaman) is basically coastal embankment as a long-term possible option that could be regarded as similar to the coastal embankment already exiting along the coast of Padang City (Kota Padang). However, considering the fact that the coastal areas of both Kabupaten Padang Pariaman and Kota Pariaman are still relatively undeveloped at present (in comparison to Kota Padang), with proper enforcement of land use regulation/control to restrict any further significant development along coastal areas, it is expected that the requirement of embankment based structural protection measures against tsunami disasters could be limited to some particular small length of developed coastal areas in future, even in the long-term.

Accordingly, the required length of any future coastal embankment to cope with tsunami is considered to be of small-scale, even in comparison to the existing coastal embankment along the coast of Padang City. In this respect it is very important to enforce land use control along the coastal areas (including coastal tree/forestation development in those landuse restricted areas, which has already been carried out at present) as the most significant nonstructural tsunami disaster mitigation measure. Such coastal forestry and plantation development measures are in fact coastal ecological enhancement measures that would assist also in coastal erosion control.

Moreover, both the possible structural measures of sediment and flood disaster mitigation do not include potential large-scale civil engineering facilities like sabo dams or flood control dams that in an overall sense are regarded as small-scale facilities such as retaining wall and improvement of drainage system. Accordingly, potential adverse environmental and social effects to the provision of these well-known and much used facilities are also regarded as easily manageable to mitigate potential adverse environmental and social effects.

On the other hand the potential long-term social and environmental beneficial effects of these comprehensive disaster mitigation measures composed of both structural and non-structural measures that include ecologically beneficial reforestation/replantation (in particular as the most significant nonstructural measure of tsunami disaster mitigation for the coastal areas of both Kabupaten Padang Pariaman and Kota Pariaman) are obvious and regarded as basic requirement to facilitate stabilization of life of potentially affected people and their economic and social activities and also the protection of their living environment.

In fact reforestation/replantation along some selected coastal belts has already been undertaken by relevant local agencies of Kabupaten Padang Pariaman and Kota Pariaman, namely, DKP (Marine and Fisheries Agency) of both Kabupaten Padang Pariaman and Kota Pariaman and Forestry and Soil Conservation Department (*Kantor Kehutanan dan Konservasi Tanah*) of Kabupaten Padang Pariaman. Such significant recent coastal reforestation/replantation areas include Batang Gasen in the northern coast (where mangrove replantation/reforestation is most significant) and Ulakan Tapakis in the southern coast (where pine trees (*cemera in Indonesian*) supplemented with mangrove replantation/reforestation is most significant).

However, as far as the terrestrial reforestation is concerned it seems that too much focus is given to the plantation of exotic flora species like pine (*cemera*) trees. As the most effective coastal erosion and also tsunami mitigation measure of reforestation/replantation, it is recommended to promote the plantation of non-exotic flora species that could grow very easily and effectively under extreme coastal weather condition like high waves and winds, such as *Batang Waru (in Indonesian)* or *Hibiscus tiliaceus L (scientific name),* especially adjacent to the coastal areas as the first defense against high waves and winds. In the inner terrestrial coastal area that is not significantly affected by high winds in particular, such exotic species like *cemera* and also coconut plantation could be promoted.

It is recommended to consider designation of significant coastal forest areas as protected forest areas to control any future potential for change in landuse. In fact, the most significant beneficial effect of coastal forestation is that it would discourage any housing development (even illegal), as it would require significant land clearance.

Currently designated protected forests and nature reserve areas have a total area of about 31,400 ha, and are located along the hilly and mountainous terrains of Kabupaten Padang Pariaman, forming its border with adjacent Kabupatens of Agam, Tanah Datar and Solok. These protected and nature reserve forest areas are composed of 3 sector areas of Maninjau Selatan, Singgalang Tandikat and Barisan I. They are basically located in critically sloping terrains of high elevation and have already been subjected to very significant deforestation, principally due to illegal logging.

In fact, illegal logging is still prevalent in these protected forest and nature reserve areas. This illegal logging is identified as a very significant environmental issue in the Environmental Status Year Book of Kabupaten Padang Pariaman in the year 2006, which is in fact published annually by Department of Environment (*KLH/Kantor Lingkungan Hidup*) of Kabupaten Padang Pariaman. Such illegal logging is visibly evident to any person visiting these protected and nature reserve forest areas. According to the Forestry and Soil Conservation Department (*Kantor Kehutanan dan Konservasi Tanah*) of Kabupaten Padang Pariaman, lack of local community support and awareness is the most significant impediment to control illegal logging.

Considering the fact that these protected areas are located along the boarder with adjacent Kabupatens of Padang Pariaman, the Provincial Government of West Sumatra is recommended to play an active role in the preservation of these protected and nature reserve forest areas, which are very important for landslide and flood disaster mitigation as well, since these forest areas are located in critically sloping terrains prone to slope failure and sediment disasters.

Finally, based on the above aspects overall, possible comprehensive disaster mitigation measures composed of both structural and non-structural measures are considered to be of Category B as per the JICA Guidelines for Environmental and Social Considerations with most of the project facilities of structural measures, being of small-scale flood and landslide disaster mitigation facilities, that might not require detailed AMDAL/EIA Studies during their implementation in the future.

However, according to the AMDAL process of Indonesia, a project is subject to mandatory AMDAL/EIA study principally based on its scale as specified by the Decree No. 11/2006, which is updated at least once in every 5 years as noted in Section 2.4.2, some of these projects of structural measures at the time of their implementation might be subject to mandatory EIA/AMDAL as their scale being at least marginally larger to fall into such category as per the relevant Decree effective at that time. In such a case the relevant project would be considered as Category A subject to detailed AMDAL/EIA Study, even though overall, the possible structural measures are considered as Category B.

In this respect it is further noted that location-wise, none of these structural disaster mitigation measures is expected to encroach into any of the protected and nature reserve forest areas located along the border with adjacent Kabupatens of Padang Pariaman. In principle, no structural disaster mitigation measures will be implemented in a protected/nature reserve area. Nevertheless at present, an urgent issue for these protected and nature reserve a forest areas is the protection of these areas against illegal logging. This shall be followed with reforestation to restore the affected forest ecological environment to its original state to the extent possible. Such restoration of forest ecosystem to its original state would involve reforestation using a variety of native flora species of non-monolithic nature.

Finally scoping for the comprehensive disaster mitigation plan for both Kabupaten Padang Pariaman and Kota Pariaman, formulated on a preliminary basis is given in Table 3.3.3.

(2) Implementation nonstructural measures only (Structurally zero option)

The proposed non-structural measures, in particular for tsunami, sediment and flood disaster mitigation, other than for reforestation and landuse limitation that include existing/remaining forestry protection and coastal tree plantation/forestation development, are basically composed of early warning system, evacuation route and shelters as well as measures through community activities to enhance community awareness on potential natural disasters.

These early warning oriented non-structural measures in general are very economical, easy and quick to implement, and very important and also the only practical means to save human lives to the extent possible in case of such potential large scale natural disasters like earthquake and tsunami. Accordingly, nonstructural disaster mitigation measures are very important and shall take precedence in the implementation of the overall disaster mitigation plan. Thus, prompt evacuation to save human lives to the extent possible will always remain as the ultimate (last resort) natural disaster mitigation action plan in particular for earthquake and tsunami disasters.

On the other hand, these warning and evacuation oriented non-structural measures in themselves will not prevent the economic, social and environmental damage inherent to such natural disasters even of manageable small scale ones, in particular sediment and flood disasters. In essence these non-structural measures could neither directly prevent the occurrence of such disasters nor mitigate their adverse social and environmental effects including disruption in life of the affected people. Damage to social and related living environmental infrastructures, in particular when the frequency of occurrence of sediment and flood disaster is high, is definitely an obstruction to leading a normal peaceful life, and therefore it is very rational to consider additional structural measures to directly cope with natural disaster to the extent possible, in particular to cope with sediment and flood disasters.

Accordingly, simple structural measures, in combination with non-structural measures, are also incorporated as possible means to mitigate natural disasters in Section 3.2. These structural measures are also determined with proper consideration to the economic condition and budgetary limitation of Kabupaten Padang Pariaman and Kota Pariaman.

Based on the above considerations, it is concluded that total reliance on non-structural disaster mitigation measures is irrational although implementation of non-structural measures shall take precedence over structural-measures, in particular to mitigate potential large-scale natural disasters like earthquake and tsunami. Accordingly, structurally zero option, although most economical in particular when the cost of restoration following a disaster is not taken into account,

alone is regarded as inadequate (necessary but not sufficient) to effectively deal with and to mitigate natural disasters.

(3) Do nothing option (Absolute zero option)

Making absolutely no effort to mitigate natural disasters, although definitely a viable option, is against the progressive sprit of human nature and hence regarded as totally irrational and requires no further consideration.

Table 3.3.3 Scoping for Comprehensive Disaster Mitigation Plan
(For Both Kabupaten Padang Pariaman and Kota Pariaman)

No	Item	Grade*	Reason
Social Environment			
1.	Involuntary Resettlement	B	The possible structural measures such as retaining wall and improvement of drainage system are of small-scale and hence not expected to involve large number of resettlement. However, the possibility of resettlement for a small limited number of people depending on the status of housing during the actual time of implementation of a project facility like embankment/dike might become inevitable.
2.	Local economy such as employment and livelihood, etc.	C	Although the construction works like tide embankment and dike by generating employment opportunity to local people is expected to be beneficial to local economy, still any involuntary resettlement and impeded access due to construction works have the potential to affect livelihood of local people.
3.	Land use and utilization of local resources	C	The possible project of structural measures such as retaining wall and improvement of drainage system do not require extensive resources for their realization and local resources should be mostly adequate considering the potential small-scale of the projects. Reforestation and land-use control as non-structural measures would be beneficial for conserved land-use.
4.	Social institutions such as social infrastructure and local decision-making institutions	C	The possible activities to be implemented under the plan are not expected to significantly influence directly social infrastructure and local decision-making institutions. However, some short-term impediment to prompt access to social institutions might result due to construction activities.
5.	Existing social infrastructures and services	C	The possible activities to be implemented under the plan are not expected to significantly influence existing social infrastructure. However, some short-term impediment to prompt access to social services might result due to construction activities.
6.	The poor, indigenous and ethnic people	C	Involuntary resettlement, though not expected to be large-scale, if not conducted on a fair manner, have the potential to affect disproportionately the poor.
7.	Misdistribution of benefit and damage	C	Lack of fair compensation during any involuntary resettlement and lack of consideration to employ local work force to the extent possible have the potential to result in misdistribution of benefit.
8.	Cultural heritage	C	The project plan is not expected to affect any cultural heritage. Still, this has to be confirmed during the implementation of projects.
9.	Local conflict of interests	C	Inadequate compensation during involuntary resettlement and lack of consideration to hire local work force as per Item 7 of above have potential to lead to local conflict of interest.
10.	Water Usage or Water Rights and Rights of Common	C	Construction of flood mitigation facilities like dikes may affect water rights at local level, which have to be given due consideration in the design of such facilities.

No	Item	Grade*	Reason
11.	Sanitation	D	Disaster mitigation in the long-term will lead to improved sanitation and also will facilitate the provision of improved sanitation services.
12.	Hazards (Risk) Infectious diseases such as HIV/AIDS	D	The facilities of the plan such as tide embankment and retaining wall are of small-scale and do not require any large scale external labor for its implementation. Accordingly, potential risk of transmission of infectious diseases is regarded as insignificant.
13.	Gender	D	Since traditionally women share high household work burden they have higher potential to be affected disproportionately during natural disasters and its consequence like evacuation to temporary shelters. Accordingly, disaster mitigation plan is regarded to be at most beneficial.
Natural Environment			
14.	Topography and Geographical features	D	The structural measures such as tide embankment, retaining wall and improvement of drainage system are of small-scale to cause any significant effects on these features.
15.	Soil Erosion	C	During the construction works like revetment works effective mitigation measures against potential soil erosion need to be considered. In the long-term the disaster mitigation measures such as grating crib works also will result in soil erosion control (long-term beneficial effect)
16.	Ground Water	D	All project activities are basically concerned to ground surface and surface water environment and have no significant effect on groundwater extraction or its quality.
17.	Hydrological Situation	D	The structural measures such as dike and improvement of drainage system are of small-scale to cause any significant effects on hydrology..
18.	Coastal Zone	C	Structural flood and tsunami mitigation facilities like coastal river levees and tsunami embankment might cause some adverse effects on coastal zone, though potential for highly significant adverse effects is considered insignificant in consideration to the small-scale of the facilities.
19.	Flora, Fauna and Biodiversity	C	Existence of any rare or endangered flora or fauna and relevant potential adverse effects and the required protection measures need to be considered during the implementation of projects.
20.	Meteorology	D	There are no activities that may affect the meteorology.
21.	Landscape	D	The structural measures such as tide embankment, retaining wall and improvement of drainage system are of small-scale to cause any significant adverse effects including visual impact on landscape.
22.	Global Warming	D	There are no activities with constant emission of green house substances. In fact reforestation would contribute to at least long-term marginal reduction in global warming potential, marginal beneficial effect.
Pollution			
23.	Air Pollution	C	Construction works like retaining wall may cause some short-term air quality deterioration especially due to dispersion of dust. However, this could be controlled with appropriate mitigation measures like water spraying.
24.	Water Pollution	C	Construction works along rivers would cause short-term deterioration in water quality due to increased turbidity in particular consequent to the disturbance of riverbank and riverbed areas during channel widening and deepening works.
25.	Soil Contamination	D	There are no activities necessitating the use of toxic materials that may lead to soil contamination.

No	Item	Grade*	Reason
26.	Waste	C	Construction wastes including surplus soil will be generated that has to be managed appropriately focused on reuse of the wastes as much as possible.
27.	Noise and Vibration	C	Construction works such as retaining wall and revetment works have potential to generate short-term noise and vibration. This has to be managed appropriately in particular when such work is carried out near residential areas.
28.	Ground Subsidence	D	There are no activities requiring significant extraction of groundwater the only major cause of any potential ground subsidence as also noted under Item 16 of above.
29.	Offensive Odor	D	There are no activities that may result in the generation of significant offensive odor.
30.	Bottom sediment	C	Channel deepening works have the potential to disturb bottom sediments, a short-term adverse effect.
31.	Accidents	C	Accidents may occur in any construction work, basically a short-term occupational health and safety issue limited to the period of construction works. Still, the probability of the occurrence of serious accident is rather low since the constructed facilities such as tide embankment and revetment are of small-scale.

*Grade of evaluation: A: Significant negative impact expected

B: Considerable negative impact expected

C: Extent of impact in unknown

D: No or negligible negative impact (also including mostly beneficial effects)

3.3.5 Environmental Conservation and Impact Mitigation Measures

Environmental conservation and impact mitigation measures are essentially interlinked and in some cases environmental/ecological conservation is prerequisite for environmental impact mitigation (as well as natural disaster mitigation). For proper consideration to this aspect as well as the distinction between social and environmental impact mitigation, overall environmental conservation and mitigation as well as social impact mitigation measures for disaster mitigation plan are discussed below. The environmental conservation and impact mitigation measures are separated between the two pilot study regions of Kabupaten Jember and Kabupaten Padang Pariaman cum Kota Pariaman principally considering their geographical distinction as being located far apart in two different islands of Indonesia (Java and Sumatra) as well as their difference in focus with respect to disaster mitigation and related environmental issues. Still, significant social impact mitigation measures are regarded as essentially very similar for both regions and hence they are dealt with comprehensively below.

1) Social impact mitigation measures

The environmental impact assessment process of Indonesia is well defined to deal with potential social issues of project execution by mandating public consultation as an essential component of EIA as per the Decision No.8/2000 on Guidance on Public Participation and Information

Disclosure of the EIA Process (Refer to Section 2.4.2). Moreover, the recently promulgated two Presidential Regulations (Regulation of 2005 and its amendment in 2006) and the subsequent most recent Decision No.3/2007 by the National Land Administration Agency (*Badan Pertanahan Nasional/BPN*) guarantees compensation to acquired properties for public sector projects up to the market price, thereby solving the most important grievance issue of PAPs (project affected persons) required to forgoe their lands/properties/houses as dealt with in Section 2.4.3.

With proper public consultation right from very beginning of the project planning to the stakeholders in particular to those PAPs who might be required to surrender their lands, properties, houses (thereby requiring involuntary resettlement) understanding and co-operation of the PAPs could be obtained. In particular, the long-term benefit of disaster mitigation project to the community shall be explained in very simple and easily understood terms. Moreover, it is strongly recommended that the compensation made shall be based on market price. This will facilitate effective co-operation of the project-affected community, including the most affected PAPs requiring involuntary resettlement.

With effective public consultation and equitable compensation scheme along with the use of local expertise and labor for the project to the maximum extent possible, not only the support of the affected community for the project execution but also the understanding of the affected community even to tolerate some temporary inconvenience during period of construction such as those given under items 2, 4, 5 and 27 of Tables 3.3.2 and 3.3.3 could be obtained. However, cost effective mitigation measures shall be made during the construction planning to the extent possible to minimize temporary inconvenience due to the construction works (such as provision of alternative temporary access, restriction of high noise/vibration construction works to daytime only in areas near to residential housings), which shall be explained to the affected community during public consultation.

Moreover, during disaster mitigation project planning stage (like M/P or F/S) proper investigation, studies (including detailed literature search and review) and identification (both to poor, vulnerable social groups, and on the existence of any cultural, archeological treasures) shall be made. In the event that PAPs from such poor, vulnerable group requiring resettlement is inevitable, socially responsible financial subsidy shall be included in the compensation system. As for archeological and cultural treasures, as far as possible the project location shall be selected so as to not to affect any such treasures. In fact every effort shall be made to include the protection and preservation of such treasures in the project plan of disaster mitigation.

The most comprehensive available relevant literature found (during this study) with consultation with relevant environmental agencies at both regions of Kabupaten Jember and both Kabupaten Padang Pariaman cum Kota Pariaman (DKLH of Kabupaten Jember, KLH of Kabupaten Padang

Pariaman, KLH of Kota Pariaman and other agencies of forestry) are their respective annual Environmental Status Year Books for the year 2006 (as also referred to in the previous section). There is no specific data available in these yearbooks concerning the locations of either poor (and vulnerable) groups or the locations of significant cultural archeological treasures in those possible areas of disaster mitigation facilities investigated in these two pilot areas (Kabupaten Jember and Kabupaten Padang Pariaman cum Kota Pariaman). Accordingly, detailed studies and investigation shall be done during detailed planning stage of disaster mitigation facilities as mentioned above.

With these effective measures (with proper identification of poor, vulnerable groups and the existence of cultural/archeological treasures) along with public consultation so that the project affected community is treated with due respect right from the very beginning of project planning, potential adverse social effects on the affected community at large including those PAPs most severely affected (requiring involuntary resettlement) could be mitigated.

2) Environmental conservation and impact mitigation measures

(1) Kabupaten Jember

Reforestation and replantation with active community participation is well in progress in deforested critically sloping terrains of Kabupaten Jember following recent slope failure disasters occurred in Panti and other mountainous/hilly areas (and the understanding of the cause for such disasters basically to be deforestation). Reforestation and re-plantation is recommended to be actively continued as the basic and absolutely necessary environmental conservation oriented natural disaster mitigation measure against slope failures and sediment disasters.

Still proper focus shall be given to the plantation of flora species with potential sustainable beneficial use like fruit trees as well in the overall mixture of non-monolithic natural flora species chosen for re-plantation/reforestation. Moreover, continued community education and awareness on the importance of forestry protection and its contribution to control slope failure induced sediment disasters (in particular in critically sloping terrains) is very important.

Similarly, reforestation of protected natural forests and their effective management against any future illegal logging is a very important duty of the responsible agency, the Department of Forestry and Plantation/*Dinas Kehutanan dan Perkebunan (Dishutbun)* of Kabupaten Jember.

This is particularly important for the ecologically very significant Meru Betiri National Park, which serves as habitat for a variety of fauna and flora that includes rare and endangered species as per the very significant and only available relevant literature, *The Annual Environmental Status Year Book of Kabupaten Jember (2006)*.

Such protected forest areas are not targeted for any structural measures of disaster mitigation, and hence reforestation shall remain as the principal non-structural means of protection for these protected and nature reserve forest areas. Since the existence of any important, rare and endangered fauna and flora species in other possible areas of structural measures of disaster mitigation is not clear from this Status Year Book, this has to be investigated during disaster mitigation project planning stage (like M/P or F/S) in a target project area, which would obviously be preceded by detailed literature search and review.

If existence of any of such endangered, rare and important species is confirmed, necessary protective mitigation measures shall be incorporated in the project plan. Typical protective measures include step-wise execution of construction works to preserve some potions of the habitat area of such species remain unperturbed, relocation of the project site itself to another area where no habitat for such species (and hence the species themselves) exist, and others.

(2) Kabupaten Padang Pariaman and Kota Pariaman

At present still ongoing illegal logging in the nature reserve and protected forest areas in the critically sloping terrains of Kabupaten Padang Pariaman is identified as the most important environmental issue requiring urgent attention and control by the relevant authorities (as also noted in the only available relevant literature, *The Annual Environmental Status Year Book of Kabupaten Padang Pariaman (2006)*).

Since these protected forest areas are located along the boarder with adjacent Kabupatens of Padang Pariaman (Kabupatens of Agam, Tanah Datar and Solok), the Provincial Government of West Sumatra is strongly recommended to undertake the lead role in the preservation of these protected and nature reserve forest areas firstly to control illegal logging that would concurrently be followed with reforestation and conservation, which is also a very important (non-structural measure) for landslide (slope failure) and flood disaster mitigation, since these forest areas are located in critically sloping terrains prone to slope failure and sediment disasters.

Coastal plantation and forestation is ongoing by relevant agencies of both Kabupaten Padang Pariaman and Kota Pariaman as the nonstructural tsunami disaster mitigation measure, which is recommended to be actively continued. However, it seems that too much focus is given in the plantation of exotic flora species like pine (*cemera*) trees. As the most effective coastal erosion and also tsunami mitigation measure of reforestation/replantation, it is recommended to promote the plantation of non-exotic flora species that could grow very easily and effectively under extreme coastal weather condition like high waves and winds, such as *Batang Waru (in Indonesian)* or *Hibiscus tiliaceus L (scientific name),* especially adjacent to the coastal areas as the first defense against high waves and winds.

In fact, designation of significant coastal forest areas that have been re-planted/and reforested as protected forest areas to control any future potential for change in landuse is strongly recommended.

Moreover, existence of important, rare and endangered fauna and flora species in possible areas of structural measures of disaster mitigation is not clear (in fact it is not clear in the whole area of Kabupaten Padang Pariaman including those protected and nature reserve forest areas located along the boarder with adjacent Kabupatens) from the only available relevant literature, *The Annual Environmental Status Year Book of Kabupaten Kabupaten Padang Pariaman (2006)*. Accordingly, this has to be investigated during disaster mitigation project planning stage (like M/P or F/S) in a target project area, which would obviously be preceded by detailed literature search and review.

If existence of any of such endangered, rare and important species is confirmed, necessary protective mitigation measures shall be incorporated in the project plan. Typical protective measures include step-wise execution of construction works to preserve some potions of the habitat area of such species to remain undisturbed, relocation of the project site itself to another area where no habitat for such species (and hence the species themselves) exist and others.

3.3.6 Conclusions and Recommendations

The overall possible sediment and flood disaster mitigation plan for all 4 priority areas of Jember District (Kabupaten Jember) and the overall disaster mitigation plans for both Kabupaten Padang Pariaman and Kota Pariaman are considered as Category B (requiring no detailed environmental and social impact assessment studies) since the action plans are mainly focused on the implementation of non-structural measures, including ecologically beneficial reforestation, supplemented with small-scale structural measures. It is recommended that the implementation of non-structural measures shall take precedence over that of structural measures.

The possible areas targeted for structural measures of disaster mitigation in both pilot regions (Kabupaten Jember and Kabupaten Padang Pariaman cum Kota Pariaman) do not cover any protected/nature reserve forest areas. Disaster mitigation measure for such a protected area is recommended to be confined principally to reforestation of any deforested lands with a variety of native flora species of non-monolithic nature to restore/replicate the original forest ecosystem to the maximum extent possible. In this respect control of illegal logging is the highest priority, in particular in the protected and nature reserve forest areas of Kabupaen Padang Pariaman, which are in fact located in critically sloping mountainous terrains. Measures to control illegal logging of protected and nature reserve forests will include educational measures to enhance the awareness of local communities on the importance and benefit of forestry protection against natural disasters.

The implementation of structural measures of disaster mitigation would inevitably cause some adverse social effects. Such adverse social effects might include acquisition of privately owned lands and properties resulting in even involuntary resettlement of some of such property owners who are required to forgo their houses. Public consultation with those people potentially adversely affected by the project (PAPs/project affected persons) right from very beginning of the project planning (as also mandated by Decision No.8/2000 on EIA Process of Indonesia) is very important and recommended as the very basic social impact mitigation measure to be duly followed. In this respect, the long-term benefits of disaster mitigation project to the community also need to be explained in very simple and easily understood terms. Moreover, it is strongly recommended that the compensation made for lost lands and properties shall be based on market price as guaranteed by the recent Decision No. 3/2007 by the National Land Administration Agency (*Badan Pertanahan Nasional/BPN*). These social impact mitigation measures are very essential and when properly implemented will facilitate effective co-operation of the project-affected community, including the most affected PAPs requiring involuntary resettlement, for the execution of the project.

3.4 Community Based Disaster Risk Management

Disaster reduction measures are most successful when they involve direct and active participation of the people most likely to be exposed to hazards. Communities must be aware of the importance of disaster reduction for their own well-being. In addition, local leaders, including both men and women drawn from political, social and economic sectors need to assume a primary responsibility for the protection of their own communities. Based on these basic policies, community based disaster risk management activities were conducted as one of the programs in the Study for enhancing regional disaster risk management capacities.

3.4.1 Community capacities to be strengthened for effective disaster risk management

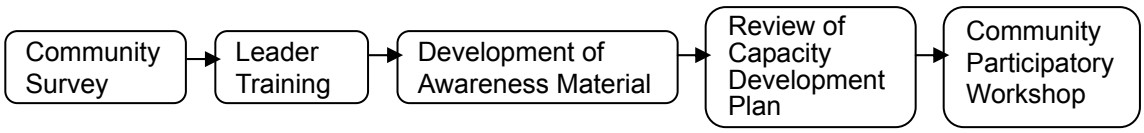
Capacities to be strengthened for effective disaster risk management are divided into the following three categories.

a) Comprehension of natural disasters and awareness of importance of disaster risk management

b) Capacity to take necessary actions for disaster reduction in coordinated manner

c) System to support and improve community's actions and awareness for disaster risk management

Community activities were conducted to enhance the above capacities in Kabupaten Jember, Kabupaten Padang Pariaman, and Kota Pariaman. The basic flow of activities was as follows:



3.4.2 Activities for Capacity Development of the Communities

1) Community Survey

Questionnaire and interview survey of the people and local government officers in the target areas was conducted in order to utilize the result for baseline data of the community activities.

(1) Target Communities

The survey was conducted in the disaster vulnerable communities which were selected based on the information of historical disaster records and results of the survey on the disaster characteristics by the Study Team and in consultation with SATLAK. Table 3.4.1 and Table 3.4.2 show the selected communities and sample numbers in each target area. The location of the target communities are shown in Figure 3.4.1 and Figure 3.4.2.

Table 3.4.1 Selected Target Communities for the Survey in Kabupaten Jember

Type of Disasters	Kecamatan	Desa	Population	Dusun	Sample Number	
					Residents	Officials
Flood	Rambipuji	Nogosari	16,687	Krajan	25	2
		Rambipuji	10,466	Gudand Karang	25	2
		Kaliwining	15,118	Bedadungkulon	25	2
		Rambigudam	7,539	Krajankidul	25	2
	Woluhan	Lohjejer	17,770	Krajan	25	2
	Silo	Harjomulyo	12,424	Jalinan	25	2
Sediment Disasters	Panti	Kemiri	8,389	Delimo	25	2
				Kantong	22	2
	Panti (upstream)	Suci	10,101	Glingseran	25	2
				Gaplek*	25	2
				Glunengan	25	2
	Silo	Garahan	9,135	Sumberlanas	25	2
Tsunami	Ambulu	Sumberejo	13,416	Payangan	25	2
	Puger	Mojosari	8,240	Mojosari	25	2
Earthquake	Balung	BalungLor	21,084	Wetankali	25	2
	Ajung	Wirowongso	7,413	Renes	25	2
Total			157,782		429	

(Population Data: 2005 Statistics/ Average Number of Dusun in one Desa is 3.8)

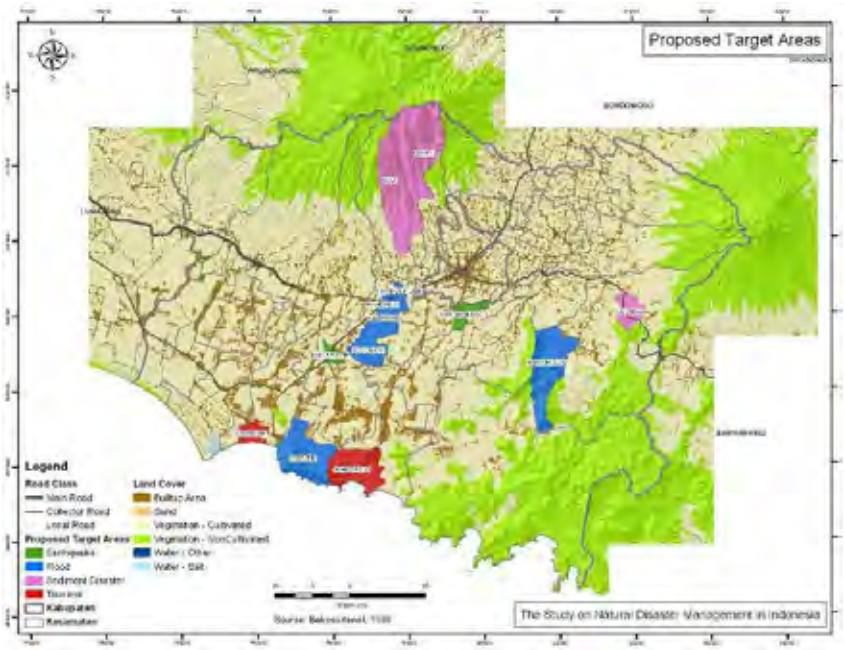


Figure 3.4.1 Location of the Target Communities for Survey in Kabupaten Jember

Table 3.4.2 Selected Target Communities for the Survey in Kab. Padang Pariaman & Kota Pariaman

Area Study	Type of Disaster	Target Areas		Population	Sample Number	
					Resident	Officer
Kabupaten Padang Pariaman	Flood	Downstream Area	Tiram - Ulakan - Ulakan Tapakis	1,040	24	1
			Pasia Baru - Pilubang - S.Limau	1,882	31	1
	Sediment Disaster	Kolam Janiah Village	Sikucur - Sikucur - V Koto Kampung Dalam	2,966	19	1
			Kampung Ladang - Limau Puruik - V Koto Timur	1,214	20	1
		Hilly Area	Asam Pulau - Anduriang - 2x11 Kayu Tanam	1,793	25	1
			Sikabu - Lubuk Alung - Lubuk Alung	2,709	21	1
	Tsunami	Coastal Area	Mandahiliang - Gasan Gadang - Batang Gasan	1,669	29	1
			Lohong - Kuranji Hilir - Sungai Limau	1,395	23	1
	Earthquake	Densely populated/ softsoil area	Sungai Durian-Sungai Durian - Patamuan	1,895	20	1
			Sialangan - Gunuang Padang Alai - V Koto Timur	1,675	20	1
Pariaman City	Flood	Downstream Area	Pauh Barat - Pariaman Tengah	1,832	31	2
			Naras Hilir - Pariaman Utara	1,168	18	2
	Tsunami	Coastal Area	Pasir Sunur - Pariaman Selatan	383	31	2
			Pasir - Pariaman Tengah	1,088	12	2
	Earthquake	Densely populated/ softsoil area	Kampung Jawa I - Pariaman Tengah	1,302	24	2
			Kampung Pondok - Pariaman Tengah	1,367	30	2
Total				25,378	400	

(Population Data: 2005 statistical report of West Sumatra)

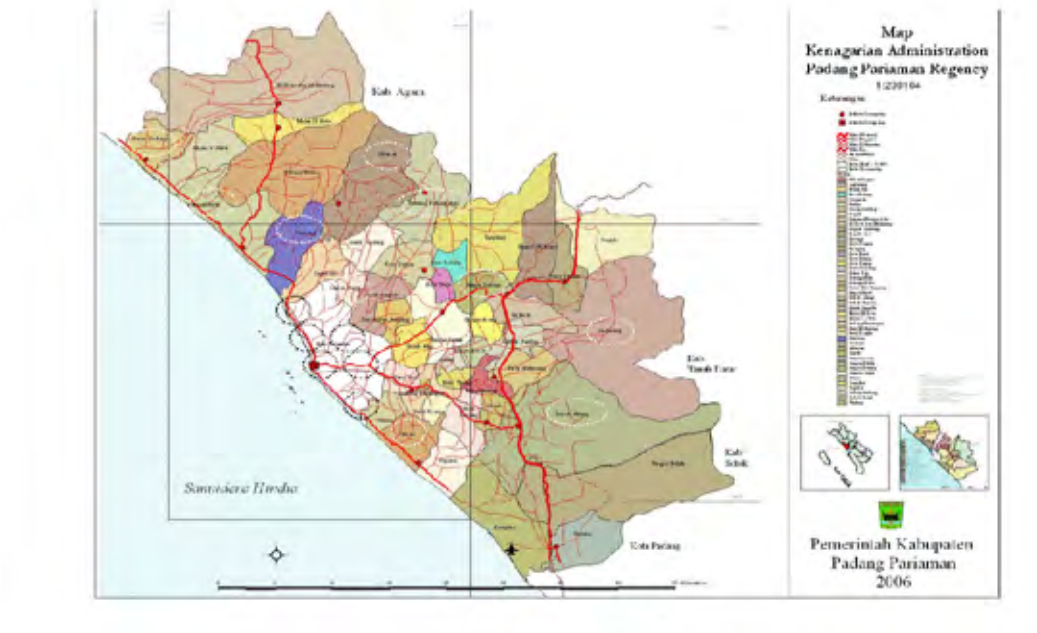


Figure 3.4.2 Location of the Target Communities for Survey in Kab. Pariaman & Kota Pariaman

(2) Main survey items

The questionnaire objectives are: a) to develop community profiles of the target communities, b) to clarify disaster profiles of the target communities, and c) to collect information on the current situation of disaster risk management in the target communities. Main survey items are: a) structure and management system of communities, b) recent main disasters, vulnerabilities to disasters, and disaster response, c) current disaster coping mechanisms, d) public awareness on disasters, and e) current situation of school education for disaster risk reduction.

(3) Characteristics of the target communities

From the survey results, the following general tendencies were identified. For more detailed results of the survey, referred to Volume 3: Supporting Report.

A. Key findings in Kabupaten Jember

- Potential disaster risk is a fairly important issue to most of respondents
- Respondents are aware to disaster risk that most likely threat their area, however, they have no preparation for future disaster
- There is no distinct mechanism for disaster risk management in the community
- There is traditional early warning system in most communities
- Many of respondents do not remember the details of past disasters
- More than 50% respondents do not feel satisfied with government support on disaster risk management
- Respondents think that they need to be involved in the decision making process. Further they feel that young people should be engaged in solving community problems
- Respondents feel that they have good social capital.

B. Key Findings in Kabupaten Padang Pariaman and Kota Pariaman

- Knowledge of local community in natural disasters was not sufficient
- Compared to earthquake and Tsunami, other natural disasters are not familiar
- Respondents learn about disasters including how to prevent and respond mainly from their own experience and TV
- Although many of respondents know how to evacuate, they do not prepare for future disasters and do not participate in disaster reduction activities so often
- Respondents feel that children's knowledge on disasters is limited and children should learn disaster risk management in schools
- Respondents feel that they have good social capital
- More than 90% of respondents live in a one-story house with masonry without pillar. Building materials for houses are mainly red bricks.

2) Training Program for Community Leaders

The role that community leaders play for enhancement of the disaster risk management in communities is quite important. Without understanding by leaders, it is very difficult to conduct sustainable and consistent activities for reducing vulnerabilities. Training programs for community leaders were conducted as an initial activity aiming at enhancing capacity against natural disaster of the community leaders by understanding the mechanism of natural hazards, historical events of hazards, causes of local vulnerabilities, and countermeasures.

(1) Purpose, expected outcome and agenda of the training program

The purposes of the program were:

a) To improve local leaders knowledge to understand the characteristics of natural disaster most likely to occur in their area

b) To transfer the results of community survey to the local leader to trigger their responsibility to develop better disaster risk management based on their local conditions

c) To improve local leaders knowledge on disaster reduction measures.

The expected outcome of the program was to prepare an action plan to enhance community capacities against natural disaster for each target community. The action plan was used as the basis to select one pilot community as a target of community workshops in each model area of the Study.

To achieve the purposes and accomplish the expected outcome, the sessions shown in Table 3.4.3 were held.

Table 3.4.3 Contents of Leader Training Program

Introduction:	"Inamura-no-hi" Discussion: "How important is it that the communities work together in case of emergency"
Session 1:	Disaster Situation in Indonesia Past bitter experiences & risks in the future (Sediment disaster, flood, earthquake and Tsunami)
Session 2:	Disaster Management System including Early Warning System
Session 3:	Learning from Japanese Experience for Disaster Risk Management
Session 4:	Town Watching & Community-based Hazard Mapping Program
Session 5:	Community-based Disaster Risk Management (Good practices, Forming a committee, Mock drill for evacuation)
Session 6:	Development of Action Plan for Each Community

(2) The Participants of the program

The program in Kabupaten Jember was conducted during 9-11 September 2007 at Hotel Bandung Permai. In total, 21 participants joined the program. They consisted of 17 community leaders from Kecamatan Rambipuji, Kecamatan Silo, Kecamatan Wuluhan, Kecamatan Panti,

Kecamatan Ambulu, Kecamatan Ajung and Kecamatan Balung, 2 PMI (Indonesia Red Cross) staff members, and 2 SATLAK officers.

The program for Kabupaten Padang Pariaman and Kota Pariaman was conducted during 18-20 June 2008 at Rocky Plaza Hotel. In total, 21 participants joined the program. They consisted of 16 community leaders form Pilung, Gasan Gadang, Limau Puruik, Gn Padang Alai, Sikucur, Anduring, Lubuk Aluhng, Sungai Durian, Ulakan, Kuranji Hillar, Naras Hilir, Pauh Barat, Kampung JAwa I, Pasir, Pasir Sunur, Kampung Pondok, 2 PMI (Indonesia Red Cross) staff members, and 3 SATLAK officers.

(3) Achievement and outcome of the training program

Through the training program, participants were able to:

a) improve their knowledge to understand the characteristics of natural disaster most likely to occur in their area

b) acknowledge their responsibility to develop better disaster risk management plan based on their local condition

c) improve their knowledge on disaster reduction measures.

As outcomes of the program, participants developed their own action plans for each target community to enhance community capacities against natural disaster. They also developed draft community hazard map based on their current information.

Figure 3.4.3 Town Watching (left) / Hazard Mapping Exercise (right) in Jember

Figure 3.4.4 Town Watching (left) / Hazard Mapping Exercise (right) in Padang Pariaman

3) Development of Disaster Awareness Material

Disaster awareness leaflets were developed in each model area for use in the community workshops to be held after leader training in the selected pilot communities and for leader distribution in the targeted communities.

The leaflets were prepared in the full color trifold style using A4 paper for four kinds of disasters (flood, sediment disaster (landslide, mud flow, debris flow and so on), earthquake and tsunami) as shown in Figure 3.4.5 and Figure 3.4.6. Based on the results of the community survey, the contents of each of the leaflets consisted of systematic basic information of disasters and disaster risk management such as: i) mechanism of the hazards, ii) signs and early warnings, iii) prevention/mitigation and preparedness, iv) emergency response, and v) contact information in case of occurrence of disasters.

100 copies each of 4 leaflets were provided to each of community leader in the targeted communities for use in their community activities.

4) Pilot Project Plan for Pilot Community

(1) Selection of a pilot community in each model area

In Kabupaten Jember, Desa Kemiri of Kecamatan Panti was selected as the pilot community for conducting the workshops considering leader's willingness and risk conditions based on the survey and training program for leaders. Especially Dusun Delima which was heavily affected by the flood and sediment disasters in 2006 was mainly targeted in the activities.

In the model area of West Sumatra, Kelurahan Naras Hilir in Kecamatan Pariaman utara, Kota Pariaman was selected as the pilot community based on the survey results and the output of training program. Naras Hilir is located near the coast in an area vulnerable to Tsunami and earthquake.

(2) Activities in the selected pilot community

Based on the results of the community survey and training program for leaders, the capacity development plans for Kabupaten Jember and Kabupaten Padang Pariaman & Kota Pariaman were reviewed and finalized as shown in Table 3.4.6 and Table 3.4.5.

The activities were decided focusing on the main target disasters in the selected communities. They were flood and sediment disaster in Desa Kemiri (Jember) and earthquake in Naras Hilir (Kota Pariaman).

Figure 3.4.5 Trifold Leaflets for Flood, Sediment Disasters, Earthquake, and Tsunami (from the top to the bottom)

Figure 3.4.6 Trifold Leaflets for Earthquake, Tsunami, Flood and Sediment Disasters (from the top to the bottom)

Table 3.4.4 Capacity Development Plan for Kabupaten Jember

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Project Purpose: Community disaster management capacity in Kabupaten Jember improves.	**Indicators:** Community disaster management activities are conducted in the communities other than the pilot project community Improvement of people's knowledge on the necessary disaster risk management such as evacuation routes ant places in communities other than the pilot project community	Result of questionnaires to the leaders who participate in the leader training, which will be conducted at the end of project period	Leaders will not change their position
Outputs: Present status of community disaster risk management in targeted communities is analyzed Leader capacity for disaster reduction in target communities is enhanced Public awareness on disaster risk management in targeted communities is improved Framework for enhancing community disaster management is well established in the pilot community The result of pilot project spreads as a reference in Kabupaten Jember	**Indicators:** a) A compiled survey report shows profiles of target communities b) Evaluation result of the training program shows increased awareness of the leaders c) Number of implementation of awareness activities after training program is increased d-1) Number of participants in the workshops d-2) Community action plan for disaster risk management is developed e) Number of the participants of the workshop	A survey report A report of the result of evaluation Follow-up survey to leaders List of participants Established action plan List of participants	Leaders keep their position Main actors in the communities participate in the activities
Activities: a) To grasp characteristics of the selected target communities by community survey b) To conduct training program for the targeted community leaders c) To develop and distribute disaster awareness materials to residents through leaders in target communities d-1) To conduct 2-day workshops for residents three times in a selected pilot communities d-2) To install measuring equipment for early warning such as simple rain gauges and water level gauges in the pilot community d-3) To conduct observation activities continuously using the installed measuring equipment by the pilot community members d-4) To conduct mock drill for warning transmission and evacuation in the pilot community d-5) To install signboards and/or distribute posters for disaster risk management in the pilot community e) To conduct a workshop to introduce pilot activity for leaders in other areas and related organizations in Kabupaten Jember		**Inputs:** **Experts:** Japanese experts Indonesia experts **Equipment**s: Measuring equipments Signboards **Publications**: Disaster awareness leaflets Posters Budget: As necessary	

Table 3.4.5 Capacity Development Plan for Kabupaten Padang Pariaman and Kota Pariaman

Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important Assumptions
Project Purpose: Community disaster management capacity in Kabupaten Padang Pariaman & Kota Pariaman improves.	**Indicators:** Community disaster management activities are conducted in the communities other than the pilot project community Improvement of people's knowledge on necessary disaster risk management such as evacuation routes ant places in communities other than the pilot project community	Result of questionnaires to the leaders who participate in the leader training	Leaders will not change their position
Outputs: Present status of community disaster risk management in targeted communities is analyzed Leader capacity for disaster reduction in target communities is enhanced Public awareness on disaster risk management in targeted communities is improved Framework for enhancing community disaster management is well established in the pilot community The result of pilot project spreads as a reference in Kabupaten Padang Pariaman & Kota Pariaman	**Indicators:** a) A compiled survey report shows profiles of target communities b) Evaluation result of the training program shows increased awareness of the leaders c) Number of implementation of awareness activities after training program is increased d) Number of participants in the workshops and community action plan e) Number of the participants of the workshop	A survey report A report of the result of evaluation Interview to some leaders after 3 time workshops List of participants List of participants	Leaders keep their position Main actors in the communities participate in the activities
Activities: a) To grasp characteristics of the selected target communities by community survey b) To conduct training program for the targeted community leaders c) To develop and distribute disaster awareness materials to residents through leaders in target communities d-1) To conduct 2-day workshops for residents three times in a selected pilot communities d-2) To introduce techniques of construction or reinforcement for earthquake resistant building in the pilot community d-3) To establish a community committee and discuss roles and activities d-4) To conduct a first aid training on community level in case of emergency d-5) To conduct teachers and school students awareness program in the pilot community e) To conduct a workshop to introduce pilot activity for leaders in other areas or related organizations in Kabupaten Padang Pariaman & Kota Pariaman		**Inputs:** **Experts:** Japanese experts Indonesia experts **Publications**: Disaster awareness leaflets **Budget:** As necessary	

5) Activities for Capacity Development in the Pilot Community

(1) General

Three community workshops were held in series in the selected pilot communities in each of model area of the Study.

The main objectives of the workshops were: (1) to develop capabilities of the community for disaster risk management and make disaster resilient community, and (2) to promote a "Culture of Disaster Prevention" in the community for taking action for one's own sake by organizing the workshops for community members under the community leader. In addition, it aimed at providing an opportunity to share good practices of community activities with the leaders in other disaster vulnerable areas.

The purposes of the community workshops were:

- To clarify hazards and vulnerability to disasters of communities
- To foster common understanding of risks among all the stakeholders of the community including local residents and government officials
- To identify problems in the community and measures to be taken for improving disaster risk management
- To develop community-based hazard map and formulate community disaster risk management plan.

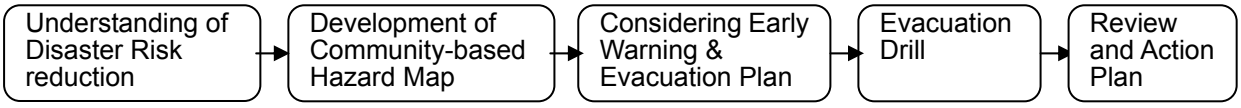
(2) Selection of the participants

Target participants of the workshops were basically community members in the pilot communities, including key community members such as religious leader, LINMAS members and womens committee leader. In addition, leaders in other areas who attended the leader training were invited as observers for improving their own activities. SATLAK officers and head of Kecamatan were invited for giving advice and actual community situations in the workshop.

In the third workshop in Naras Hilir (Kota Pariaman), school students and teachers were the main target participants. However, representatives of community members also participated in the workshop for sharing their experiences in the past two workshops.

(3) Activities in Kabupaten Jember

The flow of activities in the participatory workshops in Kabupaten Jember were conducted as follows:.



Detailed activities provided in the workshops are as shown in Table 3.4.6.

Table 3.4.6 Agenda and Achievement of the Workshops in Kabupaten Jember

First Workshop (12-13 January 2008, 39 participants)		
Session 1:	Lecture on potential main hazard (Sediment Disasters/Flood) - Introductory video presentation - Presentation on the mechanism of the hazard - Lecture on past disaster situation in Indonesia including by an person who have real experience - Introduction of the characteristics of potential hazard in the community	[Achievement] - to enhance understanding of hazards and possible disasters in the communities, and - to make better understanding of current situation of community for disaster risk management through the process of developing draft hazard map of the communities by themselves.
Session 2:	Discussion on reducing damage by potential disasters - Future improvement: disaster mitigation measures, disaster preparedness, disaster response system - Discussion on "What can we do in our community"	
Session 3:	Lecture on other potential hazards (Earthquake) - Video presentation (NHK 5-minute video) - Introduction of mechanism of the hazards and disaster risk management - Past disasters in Indonesia	
Session 4:	Town Watching and Hazard Mapping for Disaster Reduction	
Session 5:	Lecture & discussion on Importance of Community's cooperation & collaboration for effective disaster reduction - Picture show "Inamura-no-hi" story - Discussion	
Second Workshop (28-29 June 2008, 43 participants)		
Session 1:	Establishment of community-based early warning system (effective monitoring and warning system) Lecture & Group Discussion	[Achievement] - to learn importance of early warning to mitigate damage and how to observe rainfall amount, - to consider their own early warning and evacuation system, - to prepare a evacuation drill, and - to finalize the community-based hazard map by themselves.
Session 2:	Promotion of Observation of Rainfall Amount - Presentation: Introduction of relation between rainfall and disaster - Practical Activity: Let's try to make hand-made rain gauge	
Session 3:	Completion of Community-based hazard map - Presentation: Some samples of utilization of hazard map in Japan and others - Group Work: Final drawing and adding useful information for reducing disaster damage on the map	
Session 4:	Discussion on Disaster Management Drill - Video presentation: samples in other cities - Creation of Disaster Management Committee and Sub-Committees for effective disaster response	
Session 5:	Planning of preparation for your family - Let's think emergency goods - Bingo game for learning emergency goods	
Other	Information transfer game to learn difficulty of accurate and prompt information transfer	

Third Workshop [Evacuation Drill] (27-28 August 2008, 200 participants from Dusun Delima for drill & 20 for preparation meeting and 40 for evaluation meeting)		
Module 1:	DESA committee meeting for preparation of the drill - Confirmation of procedures and roles	[Achievement] - to review the designated early warning and evacuation plan in the community, - to develop action plan to improve community-based disaster risk management in Desa Kemiri, and - to foster community's independent efforts for disaster risk management
Module 2:	Evacuation Drill based on the designated plan - Early warning information - Decision making by Desa head - Information dissemination - Evacuation activities - Management of evacuation site	
Module 3:	Evaluation meeting by committee members - Evaluation of evacuation activities - Development of action plan for improvement	

Figure 3.4.7 Town Watching (left)/ Community Hazard Mapping (right)

Figure 3.4.8 Creation of Simple Rain Gauge (left)/ Community Hazard Map Finalization (right)

Figure 3.4.9 Developed Evacuation Map (left)/ Evacuation Drill (center & right)

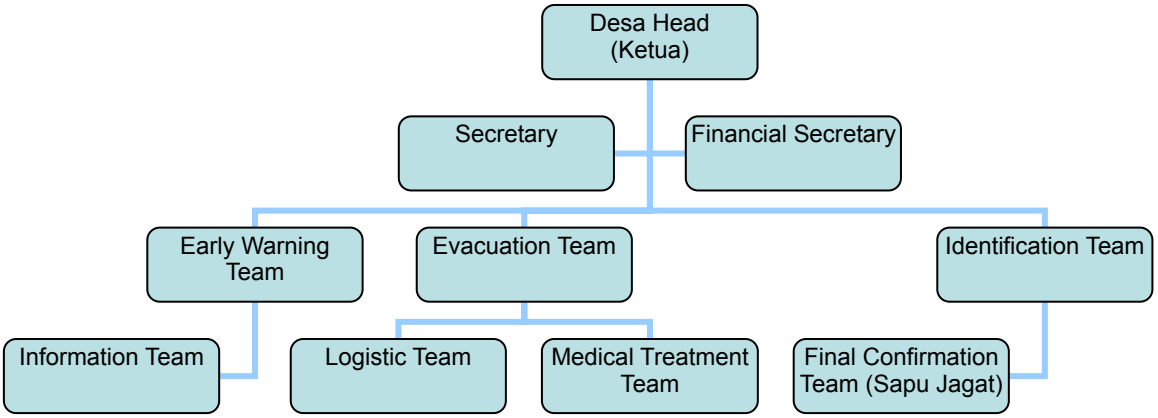


Figure 3.4.10 Designated Committee of Desa Level

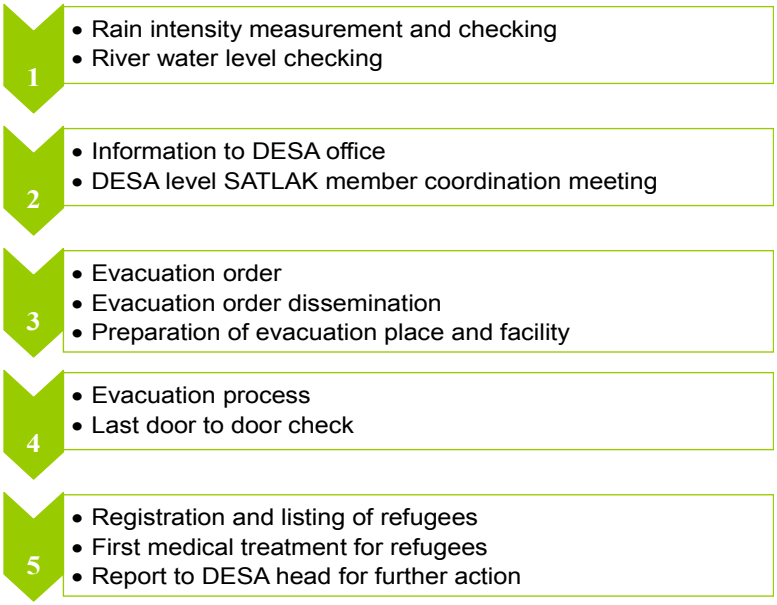


Figure 3.4.11 Designated Evacuation Plan

[Evaluation of Activities in Kabupaten Jember]

Basically, all the planned activities were smoothly done in the target areas of the Study in Kabupaten Jember. Especially the activities in Desa Kemiri (the pilot community), were conducted with active involvement of the community members by leadership of Desa head with active participation of the community members of the expected numbers. The evaluations which were asked after each of workshops show they were satisfied with the provided lectures and information, and gained substantial knowledge on disaster risk management. However, some of the participants requested to provide continuous support for this kind of activity, which means

that the activities under the framework of the Study were still not enough for them.It also indicates their willingness to be involved in more disaster risk management activities after the Study activities.

In the evacuation drill conducted for reviewing the outcomes of past workshop activities, the designated plan of action in case of emergency included early warning systems. As the action of the community people was basically smoothly taken, it is evaluated that the Desa level capacity for disaster risk management was improved through the workshop.

In addition, through the discussion to develop an action plan in the pilot community, they could identify the weak points and deficiencies for effective disaster risk management. Their future constructive action to realize the plan is expected to improve the current situation.

In order to review condition of prevalence of disaster risk management activities in the targeted areas, an interview survey to community leaders who attended the leaders' training was conducted after all the activities in Kabupaten Jember were completed. The result of the survey shows that most of the leaders conducted some activities utilized the distributed disaster awareness leaflets based on their knowledge learned through the training program. While, their activities were limited mainly to the lectures to the residents, and only few leaders conducted practical exercises such as hazard mapping or evacuation drill. It is considered that kick-off encouragement or support from outside will be required for further promotion of disaster risk management activities in communities..

Also, SATLAK members are still not fully engaged in the CBDRM activities. Although we requested the participation of the SATLAK members in the community activities, they just attended only at the beginning of workshops or came only for opening ceremony excluding the evacuation drill. It is assumed that they are not sufficiently aware of their roles to promote the CBDRM activities. It was required to increase their awareness on the importance of CBDRM activities before the initiation of activities, and to accelerate their proactive involvement in the Study activities. Creating more interest should be seriously considered for ensuring sustainability and expanding of CBDRM activities in all over Kabupaten Jember. However, the Assistant II of SATLAK Kabupaten Jember mentioned in the evaluation of the evacuation drill that SATLAK would support the CBDRM activities in the future. It is expected that SATLAK would consider a strategy for promoting CBDRM activities in their future plan.

(4) Activities in Kabupaten Padang Pariaman and Kota Pariaman

The activities in the participatory workshops in Kabupaten Padang Pariaman and Kota Pariaman were conducted as shown in the Table 3.4.7.

Table 3.4.7 Agenda and Achievement of the Workshops in Pariaman

First Workshop (26-27 July 2008, 44 participants)		
Session 1:	Lecture on potential main hazard (Earthquake/Tsunami) - Presentation on the mechanism of the hazard - Lecture on past disaster situation in Indonesia - Introduction of the characteristics of potential hazard in the community	[Achievement] - to enhance understanding of hazards and possible disasters in the communities, - to make better understanding of current situation of community for disaster risk management through the process of developing draft hazard map of the communities by themselves.
Session 2:	Introductory presentation on earthquake-proof construction	
Session 3:	Lecture on alternative way to reduce hazard (Vegetation plantation, sea belt) - Introduction of important of sea shore vegetation - Experienced from another country	
Session 4:	Lecture & discussion on Importance of Community's cooperation & collaboration for effective disaster reduction - Picture show "Inamura-no-hi" story - Good examples of community cooperation	
Session 5:	Town Watching and Hazard Mapping for Disaster Reduction	
Second Workshop (23-24 August 2008, 45 participants)		
Session 1:	Review of the 1st community workshop	[Achievement] - to learn importance of early warning to mitigate damage, - to learn the first aid treatment, - to recognize importance of the activity on community level, - to consider what is the most useful way to reinforce against earthquake for their house.
Session 2:	Lecture on Early warning System in Pariaman	
Session 3:	Lecture and Exercise: First aid treatment	
Session 4:	Lecture and discussion on community level - Finalization of community hazard mapping - Discussion about Roles and Activities	
Session 5:	Lecture on current condition of earthquake in Mentawai Island	
Session 6:	Lecture on the basic explanation of residence and retrofitting in Indonesia	
Third Workshop (2-3 November 2008, 58 participants)		
Module 1:	Lectures on Natural Disasters and Disaster Management (Earthquake, Tsunami)	[Achievement] - to understand correct information concerning natural disaster, - to make a discussion through on the town watching program - to recognize the communities' role and activities - to exchange opinion between students and community leaders
Module 2:	Town Watching for Disaster Reduction and Hazard Mapping in Naras Village	
Module 3:	Practical Exercises and Discussion - First aid treatment and Exercise - Earthquake-proof Construction Community's Roles and Activities for Disaster Reduction	


Figure 3.4.12 Town Watching (left)/ Community Hazard Mapping (right)



Figure 3.4.13 Lecture of Retrofitting (left)/ First Aid Training (center)/ Tentative Committee (right)


Figure 3.4.14 Discussion on Lecture (left)/ Lecture of School Activity (right)

[Evaluation of Activities in Kabupaten Padang Pariaman and Kota Pariaman]

Basically, all the planned activities were smoothly done in the target areas of the Study in Kabupaten Padang Pariaman and Kota Pariaman. The participants who attended training program for community leaders could study eagerly about disaster reduction. After this training, Naras Hilir in Kota Pariaman was selected as a pilot community for conducting participatory workshops. The participants of the 3-time workshops could also eagerly exchange their opinion for disaster risk management. The evaluations which were asked after each of workshops show that they satisfied the provided lectures and information, and gained substantial knowledge on disaster risk management. However, the evaluations also made clear that there were needs for further detailed information of countermeasure against earthquake and tsunami.

One of main outcomes on 3-time workshops was the formulation of community committee for disaster risk management. One of the selected committee member mentioned that they should make more efforts by themselves to protect their family and village. Through the interview with some participants after 3-time workshops, it was found that they finalized the committee by themselves and discussed the role and activity for disaster risk management. Capacity for disaster risk management will be further improved by their sprit of commitment gained through the workshop.

Besides, the participants were deeply interested in the lecture of retrofitting. They have little knowledge about earthquake-proof architecture before the workshops. They could learn and consider how to reinforce buildings and houses through the workshops. It may be difficult for them to immediately retrofit existing buildings and houses due to financial constraints. However, it is expected to improve condition of the buildings and houses slowly but steadily.

The third workshop was conducted at public city hall of Kota Pariaman with the participation of students and teachers from schools in Naras Hilir. In addition, some community leaders who participated in the 1st and the 2nd workshop supported the third workshop. Disaster awareness program targeted at schools is one of effective ways to disseminate accurate information for disaster reduction. The participants of the program leaned disasters and disaster risk management with keen interest. It is expected that voluntary efforts for disaster reduction by the participated students as one of the main actors will improve disaster risk management in their communities.

Also, SATLAK members participated in the CBDRM activities and gave explanation about the past activities and future plan for disaster risk management in the area. However, through discussion in the training and workshops, it was found that there was big gap between participants' expectation and public supply for disaster reduction. Continuous discussion and exchange of opinions among all the stakeholders are required to further enhance capacity and improve system for disaster risk management in Kabupaten Padang Pariaman and Kota Pariaman.

3.4.3 Conclusions and Recommendations

Through the CBDRM activities in Kabupaten Jember, Kabupaten Padang Pariaman, and Kota Pariaman, it was recognized that the system to support or foster the CBDRM activities in communities is still weak. After the Sumatra Earthquake and Tsunami disaster in December 2004, many activities related to disaster risk management in communities were implemented. However, it was found that the activities are still at the first stage for repeating or were ended as ad hoc events.

More efforts for promoting CBDRM activities are required for the organizations related to disaster risk management. To support those efforts, the "Guidelines for CBDRM activities" (refer to the Volume 4: Appendixes) were compiled based on the experiences and results of CBDRM activities in Kabupaten Jember, Kabupaten Padang Pariaman, and Kota Pariaman. The guideline provides the basic strategy and framework to conduct CBDRM activities. It is expected that CBDRM activities will be propelled by effective use of the Guideline. Further it is requested to modify the Guideline based on their experience in the CBDRM activities by the initiatives of BNPB.

In addition, to ensure continuous CBDRM activities, a support system to sustain their efforts is required. They desired the establishment of a system to provide regular opportunity to learn disaster and disaster risk management for community leaders in disaster vulnerable areas, and to support kick-off activities in the communities. However, even when it is difficult to allocate budget for the activities, award for good practices of the CBDRM activities, or public awareness program for disaster risk management in Kecamatan or Kabupaten level can create an opportunity to consider their own efforts for disaster risk management. As a first step to promote sustainable CBDRM activities, at least a small support system should be included in the local government system.

In addition, an early warning system to deliver the information to the community level for mitigating damages caused by disaster is still weak or is yet to be established. It is necessary to improve current conditions in order to assure or make effective the community actions to be designated by CBDRM activities.

3.5 Strategy for Formulation of Regional Disaster Management Plan and Guideline for Formulation of Regional Disaster Management Plan for Selected Natural Disasters, and Activities for Formulation of the Plan

3.5.1 Strategy for Formulation of Regional Disaster Management Plan

Regional Disaster Management Plans were prepared based on the discussions with relevant officers, and to fulfill the recommendations mentioned in this section. The plan should be continuously modified and improved by the officials of Kabupaten Jember.

Based on the aforementioned findings in the Study, Regional Disaster Management Plans in Kabupaten Jember, Kabupaten Padang Pariaman, and Kota Pariaman were formulated. Before starting concrete activities for formulation of the plan, relevant officers from pilot Kabupatens, Kota, and JICA Study Team discussed and confirmed the following basic policy for formulation of the plan:

1) Although regional disaster management plan needs to cover both natural disasters and also accident disasters, only four (4) kinds of natural disaster (earthquake, tsunami, flood and sediment disaster) were selected as target disasters in this Study. Therefore, in the future, Kabupaten and Kota need to formulate and add parts for other disasters utilizing knowledge and experiences acquired through activities for formulation of the plan in this Study.

2) In the same way as the structure of regional disaster management plans in Japan, the plan has several “Parts” for each type of disaster, and each “Part” basically consists of four (4) sections, “General”, “Pre-Disaster Measures”, “Emergency Response Measures” and “Post Disaster Measures” along with phase of disaster response. The reasons for applying this kind of structure are: 1) a proper and concrete plan can be described based on the characteristics of each disaster as well as in each phase of disaster response, 2) Indonesian side can easily add “parts” for other disasters not covered in this Study to be able to formulate plans in the future. In addition, while this Study targets four (4) kinds of natural disasters, separated into two documents considering similarity of some disasters: “Earthquake Disaster Measures” deals with earthquake and tsunami, and “Rain and Storm Disaster Measures” deals with flood and sediment disaster. In case of Kabupaten Jember, since main disaster in the area is sediment disasters, therefore, “Rain and Storm Disaster Measures” are set as Part 1 and “Earthquake Disaster Measures” as Part 2, while Kapubaten Padang Pariaman, and Kota Pariaman are opposite from Kabupaten Jember.

3) Contents of the plan are prepared based on the Japanese plan, but modified the contents to be suitable for the current conditions of Indonesia.

4) Finalization of the plan toward authorization and promulgation will be conducted by Indonesian side based on the plans formulated as outputs of this Study.

The plan has been prepared mainly by Kapubaten and Kota Planning Team formulated for the Study and JICA Study Team through a series of workshops with Planning Team intensively and actively. Regional disaster management plans formulated in this Study are shown in Volume 2-3 to 2-5 of this report.

In addition, all levels of disaster management plan must be in the same structure to be able to coordinate among all levels of government. And in the study, national level and local level for Kabupaten and Kota were formulated. Therefore, provincial level, also needs to follow the same structure to be able to coordinate well among all level of government. There are several provinces that have already formulated regional disaster management plan; however, they still need to modify them by formulated by types of disasters. The contents are recommended to reflect the disaster management cycle, since the formulated plans emphasize on "General" part, and details measures are limited. It is very much expected to improve them in the future.

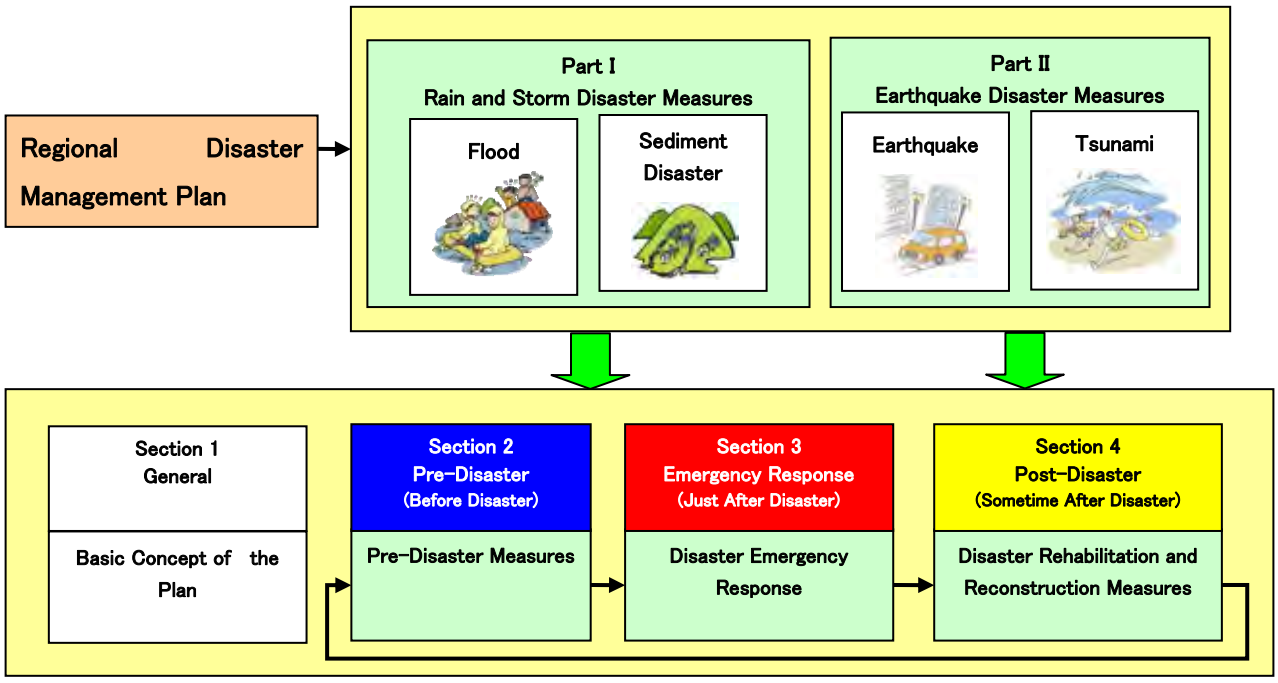


Figure 3.5.1 Categorization and Structure of the Plan

3.5.2 Strategy for Formulation of Guideline for Formulation of Regional Disaster Management Plan for all Kapubatens and Kotas in Indonesia

In the study, Regional Disaster Management Plans were formulated in 3 pilot areas. The plans include all necessary measures to be carried out to mitigate possible damages from 4 target disasters. Therefore, it is expected to disseminate information on these plans and to formulate Regional Disaster Management Plan in all other Kabupatens and Kotas in Indonesia by utilizing information prepared in this project.

To fulfill the objective, Guideline for Formulation of Regional Disaster Management Plan is formulated in the Study to be able to help formulate a plan by each Kapubatens and Kotas.

Utilizing the regional disaster management plan as a sample, it is basically not difficult to formulate the plan by each Kabupatens and Kotas. In the plan, there are several sections which need to be modified based on the characteristics of areas, however, there are also many sections, which can mostly be copied, since the basic measures to be taken are the same even when the characteristics of regions differ. Therefore, the main contents of the guideline are short and emphasize on describing the whole concept of the plan; a sample Regional Disaster Management Plan is attached to be able to smoothly understand the whole contents of the plan.

The contents of Guideline for formulation of Regional Disaster Management Plan are as follows:

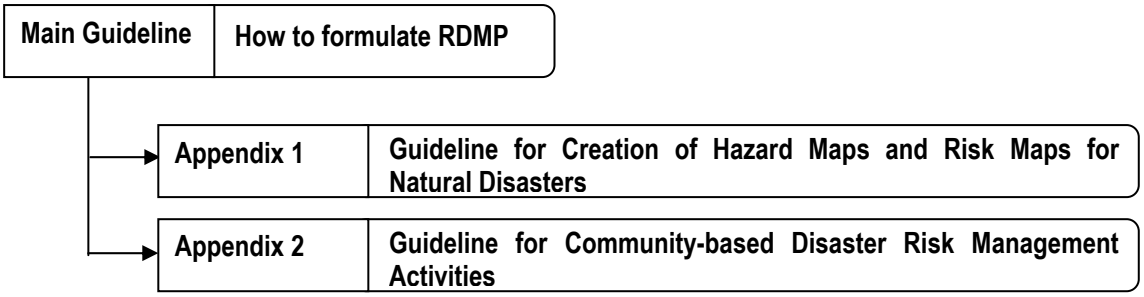


Figure 3.5.2 Categorization and Structure of the Plan

By utilizing the guideline, BNPB should distribute to Provincial governments in Indonesia, and Provincial government (BPBD) should distribute to each Kabupatens and Kotas in the province by holding workshops to explain how to formulate the plan. Also, provincial government plays an important role to inspect the contents of regional disaster management plan from each Kabupatens and Kotas to unify and coordinate with the province regional disaster management plan.

BNPB needs to keep regional disaster management plans from all Provinces in Indonesia, and Provincial BPBD needs to keep plans from all Kapupatens and Kotas in the province.

CHAPTER 4 CAPACITY DEVELOPMENT AND TECHNICAL TRANSFER, AND PUBLIC RELATIONS ACTIVITIES

4.1 Implementation of Activities for Capacity Development and Technical Transfer

One of the main objectives of the Study is to develop capacity of national and regional organizations concerned and communities for disaster management in order that various activities for capacity development and technical transfer could be done through the Study according to the plan of capacity development and technical transfer.

4.1.1 Capacity Development and Technical Transfer to National and Regional Organizations Concerned

Capacity development of disaster management related organizations is crucial for effective implementation of national and regional comprehensive disaster management plans formulated in this Study as well as review and revision of future plans.

In this Study, the following capacities were targeted for capacity development of the national and regional organizations concerned.

- Capacity of formulation and updating of plan:
  Capacity of formulation and updating of the disaster management plan at national and regional levels so that Indonesian organizations can formulate regional disaster management plans in regions other than model areas by themselves.
- Capacity of implementation of measures:
  Capacity of implementation of measures for mitigation, preparedness, emergency response and rehabilitation according to the disaster management plan.
- Capacity of coordination among organizations:
  In Indonesia, there are many organizations related to disaster management depending on the type of disaster and actions appropriate to each disaster. The coordination among these organizations and strengthening of coordination capacity are crucial for formulation and implementation of disaster management plan.

Capacity development was conducted by on the job training, workshops and seminars, and training program in Japan. The followings are objectives, contents and general outputs of workshops and seminars, and training program in Japan, which were held or conducted through the Study.

1) Joint Seminar

The joint seminars shown in the table below were held in Jakarta targeting to BAKORNAS PB (BNPB), SATKORLAK, SATLAK and concerned organizations.

Objectives of joint seminar were as follows:

- Strengthening of coordination capacity between national and regional disaster management organizations
- Mutual understanding of each plan of disaster management and strengthening of consistency of each plan

In the joint seminars, information and opinions were exchanged especially among BAKORNAS PB (BNPB), SATKORLAK and SATLAK, which are the main counterparts of this Study, regarding the current status of disaster management activities at each level as well as the progress of formulation of disaster management plan at regional level. Participants could recognize the current status and issue of disaster management of each level, and the necessity of consistency of each plan through the joint seminars.

List of Joint Seminars

No.	Date	Time	Venue	Participants		Contents
				No.	Organization	
1	May 15, 2007	10:30 - 12:00	Hotel ibis Tamarin, Jakarta	40	BAKORNAS PB, SATKORLAK in East Java and West Sumatra, SATLAK in Jember, Kab. Padang Pariaman and Kota Pariaman, BMG, BAKOSURTANAL, DDN, DEPSOS, ESDM, MPPB, PU, RISTEK, JICA	- Scope, objective, contents and methodology of the Study
2	October 2, 2007	14:00 - 18:00	Sari Pan Pacific Jakarta Hotel	38	BAKORNAS PB, SATKORLAK in East Java and West Sumatra, SATLAK in Jember, Kab. Padang Pariaman and Kota Pariaman, Department of Interior, BAKOSURTANAL, PU, RISTEK, JICA	- National disaster management status & the future in Indonesia - Progress for formulating national disaster management plan - Progress for formulating regional disaster management plan in Kabupaten Jember ・Institutional arrangement ・Disaster characteristics ・Community based disaster management - Future plan for support in formulating regional disaster management plan

No.	Date	Time	Venue	Participants		Contents
				No.	Organization	
3	March 6, 2008	10:40 - 17:00	Redtop Hotel Jakarta	44	BAKORNAS PB, SATKORLAK in East Java and West Sumatra, SATLAK in Jember, Kab. Padang Pariaman and Kota Pariaman, BMG, PVG, LIPI, RISTEK, UNOCHA, ITS, UNEJ, Univ. Andalas, JICA	- National disaster management status & the future in Indonesia - Activities for formulation of regional disaster management plan in Kabupaten Jember - Contents of regional disaster management plan in Kabupaten Jember ・General concepts ・Roles and responsibilities ・Emergency response headquarters ・Evacuation ・Disaster information gathering and dissemination ・Participation of citizens
4	December 11, 2008 (Planned)	10:40 - 18:00	Hotel Borobudur Jakarta		BNPB, SATKORLAK in East Java and West Sumatra, SATLAK in Jember, Kab. Padang Pariaman and Kota Pariaman, JICA	- Activities of the Study - Contents of national disaster management plan - Hazard & risk of natural disaster in Kab. Padang Pariaman - Contents of regional disaster management plan in Kab. Padang Pariaman - Hazard & risk of natural disaster in Kota Pariaman - Contents of regional disaster management plan in Kota Pariaman - Contents of general guidelines for formulation of regional disaster management plan

2) Workshop at National Level

The workshops at national level shown in the table below were held targeting to BAKORNAS PB (BNPB) and organizations concerned at national level.

Basically, main objectives of capacity development activities including the workshops at national level through activities for formulation of national disaster management plan are as follows:

- Strengthening capacity for formulation and updating of plan
- Strengthening capacity for implementation of measures
- Strengthening capacity for coordination among organizations

(1) Workshop in 2007

Since BAKORNAS PB has been engaged in the process of institutional reform based on The Disaster Management Law No. 24, 2007 and has had to focus the development of government and

presidential regulations including establishment of new disaster management organization of BNPB, the main topic in the workshops in 2007 were these regulations; therefore, discussion about national disaster management plan, as a main target of the Study, couldn't be conducted well with BAKORNAS PB as well as organizations concerned.

List of Workshops at National Level in 2007

No.	Date	Time	Venue	Participants		Contents
				No.	Organization	
1	April 24, 2007	9:00 - 10:30	Conference room, BAKORNAS PB	11	BAKORNAS PB	- Scope, objective, contents and methodology of the Study
2	May 15, 2007	13:30 - 17:00	Hotel ibis Tamarin, Jakarta	40	*Same as Joint Seminar on May 15, 2007*	- Disaster management status in Japan - National disaster management status & the future in Indonesia - Regional disaster management status in Indonesia
3	July 24, 2007	13:00 - 15:00	Conference room, BAKORNAS PB	10	BAKORNAS PB	- National disaster management system, plan and strategy
4	August 22, 2007	14:00 - 15:30	Conference room, BAKORNAS PB	29	BAKORNAS PB, BMG, DKP, PU	- The earthquake hazard and disaster - Disaster status and level
5	August 29, 2007	14:00 - 15:30	Conference room, BAKORNAS PB	16	BAKORNAS PB	- Government regulation and Presidential regulation
6	Septem ber 25, 2007	14:00 - 15:30	Conference room, BAKORNAS PB	11	BAKORNAS PB	- Government regulation and Presidential regulation

(2) Workshop in 2008

Organization of new disaster management agency (BNPB) that has almost been established, and concrete activities and discussion for formulating national disaster management plan were started. As a first step, BNPB organized a task force team for formulating national disaster management plan. In addition, BNPB and the Study Team agreed on a basic policy for formulation of national disaster management plan as follows: 1) structure of the national disaster management plan in Indonesia would be similar to the structure of disaster management basic plan in Japan, 2) contents of the plan would be prepared based on the Japanese plan correcting it to be suitable for the current state of Indonesia, and 3) the plan would be finalized by the Indonesian side.

One week's workshops including internal workshop between BNPB and the Study Team. Workshop to invite organizations concerned were planned to be held once a month to discuss a specified theme.

In the workshops, contents of important items and determination of responsible organizations of each item of the plan were mainly discussed based on the draft plan prepared by the Study Team. Through the discussions, it is concluded that BNPB has comprehended the content, necessity,

background and meaning of each item of the plan, and BNPB has increased understanding of disaster management planning by comparing activities with their own regulations and guidelines, and consequently their capacity for future modification and updating of the plan has been enhanced. In addition, each workshop with organizations concerned was held by BNPB as a main actor from selection and inviting of organizations concerned along the theme of the workshop to chairing and conducting of the workshop. BNPB summarized the discussion about determination of responsible organizations of each item in the plan. These activities contributed to enhancing BNPB's capacity of coordination of organizations concerned. When BNPB will carry out the activities for coordinating and monitoring the state of implementing disaster management activities by responsible organizations based on the national disaster management plan in future, their capacity of coordination will be enhanced and status of BNPB will also be improved.

List of Workshops at National Level in 2008

No.	Date	Time	Venue	Participants		Contents
				No.	Organization	
1	May 15, 2008	11:00 - 16:30	Conference Room at 4th Floor of BNPB	12	BNPB	- Kick-off meeting - Activity schedule - Structure and contents of national disaster management plan in Indonesia - Organizing task force team
2	Main Theme: General Issues, Pre-Disaster					
2-1	July 14, 2008	9:30 - 12:00	Conference Room at 2nd Floor of BNPB	14	BNPB	- Outline of the past Study activities - Disaster management system in Japan - Contents of parts of "general issues" and "pre-disaster" in draft national disaster management plan
2-2	July 15, 2008	13:30 - 16:00	Conference Room at 4th Floor of BNPB	12	BNPB	- Responsible and relevant organizations - Hazard & risk assessment and methodology of creation of the maps
2-3	July 16, 2008	8:00 - 10:00	Conference Room at 3rd Floor of BNPB	5	BNPB	- Responsible and relevant organizations
2-4	July 17, 2008	10:00 - 12:00	Conference Room at 2nd Floor of BNPB	36	BNPB, DEPTAN, DEPKOMINFO, RISTEK, DESDM, DKP, DEPDIKNAS, BMG, LIPI, LAPAN, DEPKES, BAPPENAS, Dept. PU, PORLI, TNI, DEPSOS, DEPHUT, KOKESRA	- Disaster management system in Japan - Contents of parts of "general issues" and "pre-disaster" in draft national disaster management plan - Responsible and relevant organizations
2-5	July 18, 2008	13:00 - 14:00	Conference Room at 3rd Floor of BNPB	4	BNPB	- Wrap-up

No.	Date	Time	Venue	Participants		Contents
				No.	Organization	
3	Main Theme: Emergency Response					
3-1	August 12, 2008	14:00 - 17:00	Conference Room at 4th Floor of BNPB	13	BNPB	- Contents of part of "emergency response" in draft national disaster management plan - Responsible and relevant organizations
3-2	August 14, 2008	10:00 - 13:00	Hotel Millennium	25	BNPB, DEPDAGRI, BASARNAS, POLRI, Dept. PU, DEPHUB, DEPHUT, DEPKOMINFO, BAPPENAS, JICA	- Contents of part of "emergency response" in draft national disaster management plan - Responsible and relevant organizations
3-3	August 15, 2008	10:00 - 11:00	Conference Room at 3rd Floor of BNPB	6	BNPB	- Wrap-up
4	Main Theme: Post-Disaster, Action Plan					
4-1	September 23, 2008	13 :00 - 16:00	Conference Room at 4th Floor of BNPB	19	BNPB	- Contents of part of "post-disaster" in draft national disaster management plan - Responsible and relevant organizations - Action plan - Capacity enhancement
4-2	September 25, 2008	10:30 - 12:30	Hotel Millennium	28	BNPB, DEPDAGRI, Dept PU, KLH, DEPKEU, DEPHUT, BAPPENAS, TNI, DEPTAN, JICA	- Contents of part of "post-disaster" in draft national disaster management plan - Responsible and relevant organizations
4-3	September 26, 2008	10:00 - 11:00	Conference Room at 3rd Floor of BNPB	4	BNPB	- Wrap-up

3) Workshop at Regional Level

A lot of workshops have been conducted in model areas of both Kabupaten Jember and Kabupaten Padang Pariaman and Kota Pariaman as well as East Java and West Sumatra provinces.

Basically, main objectives of capacity development activities including the workshops at regional level were as follows:

- Strengthening capacity for formulation and update of plan
- Strengthening capacity for implementation of measures
- Strengthening capacity for coordination among organizations

Activities including workshops for formulation of regional disaster management plan were

mainly conducted in Kabupaten Jember in the phase from April 2007 to March 2008, and conducted in Kabupaten Padang Pariaman and Kota Pariaman from May to September 2008. Details are described below.

(1) Kabupaten Jember and East Java Province

The workshops held in Kabupaten Jember and East Java Province were divided roughly into two topics by the objective of the workshops.

A. Workshop for organizations and institution
B. Technical workshop for prior disasters

Objectives, target, and outputs of each workshop are described below.

A. Workshop for organizations and institution

The workshop for organizations and institution shown in the table below was held targeting to SATLAK of Kabupaten Jember, especially National Unity and Public Protection Board, Social Agency and Public Welfare Agency as well as SATKORLAK.

Main objectives of the workshops were as follows:

- Strengthening capacity for formulation and update of plan
- Strengthening capacity for coordination among organizations

Through a series of workshops and individual meeting & discussions with organizations concerned, it is generally judged that counterparts has grown in understanding of disaster management plan in areas such as contents, necessity of continuous revise, importance of clarification of roles and responsibilities, etc. However, it is a present issue that level of understanding of the plan is uneven by person. This is because discussion of some workshops were conducted by several participants from particular agencies as well as the time for publicity of entire plan was very limited due to taking time to prepare the entire plan.

Continuous discussion should be conducted by SATLAK and organizations concerned for updating and revision of the plan and implementation of concrete actions according to the plan. It is considered that the above-mentioned issue will be gradually eliminated through continuous discussion, which will also surely contribute to development of the above capacities.

List of Workshops for Organizations and Institution in Kabupaten Jember and East Java Province

No.	Date	Time	Venue	Participants		Contents
				No.	Organization	
1	April 26, 2007	10:00 - 11:00	Conference room, SATKORLAK, Surabaya	7	SATKORLAK of East Java	- Scope, objective, contents and methodology of the Study
2	April 27, 2007	9:00 - 11:30	Conference room, Bupati office, Jember	20	SATKORLAK SATLAK	- Scope, objective, contents and methodology of the Study
3	June 12 , 2007	9:00 - 12:00	Conference room, Bupati office Jember	31	SATLAK	- Scope, objective, contents and methodology of the Study - The earthquake hazard and disaster - Formulation of regional disaster management
4	July 26, 2007	14:30 - 17:00	Study Team office, PEMKAB, Jember	5	SATLAK	- Duty and responsibility of government organizations and concerned organizations in disaster
5	July 30, 2007	13:30 - 15:30	Study Team office, PEMKAB, Jember	6	SATLAK	- Existing disaster management plan and its problem
6	August 2, 2007	9:30 - 12:00	Study Team office, PEMKAB, Jember	5	SATLAK	- Role and function of disaster related organization in existing disaster management plan and future plan
7	August 6, 2007	9:30 - 12:00	Study Team office, PEMKAB, Jember	4	SATLAK	- Schedule and role for formulation of disaster management plan
8	August 8, 2007	9:30 - 11:30	Conference room, SATKORLAK, Surabaya	45	SATKORLAK	- Activities and efforts for disaster management in Hyogo Prefecture - Disaster management in Japan - Regional disaster management plan in Japan - Activities and contents of the Study
9	January 29, 2008	9:00 - 16:30	Pendopo Kabupaten Jember	52	BAKORNAS PB, SATKORLAK in East Java and West Sumatra, SATLAK in Jember and Kab. Padang Pariaman and Kota Pariaman, Related Agencies in Kab. Jember	- Discussion of draft regional disaster management plan in Kabupaten Jember Topic 1: Clarification of Roles and Responsibilities on Disaster Management Topic 2: Clarification of Procedures of Establishment of Emergency Response Headquarter and Criteria for Staff Gathering Topic 3: Evacuation Guidance and Order to Citizens, and Designation of Evacuation Area in Advance Topic 4: Procedure for Disaster Information Gathering and Dissemination Topic 5: Participation of Citizens to Disaster Management Activities

B. Technical workshop for prior disasters

The Technical workshop for prior disasters shown in the table below was held targeting at key persons from the related counterpart agencies in SATLAK of Kabupaten Jember, such as National Unity and Public Protection Board, Public Works Agency, Transportation Agency, Irrigation Agency, Agriculture Agency, Forestry and Plantation Agency as well as BMG Malang and Irrigation Board of Lumajang.

Main objectives of the workshops are as follows:

- Strengthening capacity for formulation and updating of plan, especially for hazard and countermeasures
- Strengthening capacity for implementation of measures
- Strengthening capacity for coordination among organizations

In a series of workshop, many topics regarding prior disasters of flood and sediment disaster were discussed with participants, for example, a basic concept of hazard, risk and countermeasures, importance of management for disaster data/information, characteristics of resent disasters, selection of prioritized disaster prone area, concrete countermeasures, etc.

Owing to these continuous workshops, the awareness of the key persons was considerably raised for reduction of prior disasters. It could be clearly confirmed from the results of questionnaires by participants about the workshop. On the other hand, it was obvious through the discussion of the workshop that inter-organizational coordination is crucial for implementation of effective countermeasures or construction of infrastructure with the consideration of disasters. In order to plan and implement the effective countermeasures against disasters, it is necessary that more close coordination and cooperation among the organizations concerned will be enhanced through further positive discussion.

List of Technical Workshops for Prior Disasters in Kabupaten Jember

No.	Date	Time	Venue	Participants		Contents
				No.	Organization	
1	September 7, 2007	8:00 - 11:00	Conference room, Study Team office, PEMKAB, Jember	26	SATLAK, BMG Malang, Irrigation Board of Lumajang	- Hazard, risk and countermeasures of flood and sediment disaster - Early warning
2	September 20, 2007	8:00 - 10:00	Conference room, Study Team office, PEMKAB, Jember	15	SATLAK	- Importance of management for disaster data/information
3	January 28, 2008	13:00 - 15:00	Conference room, Study Team office, PEMKAB, Jember	10	Related Agencies[1] of SATLAK	- Introduction of the methodology for creation of hazard maps and risk maps - Selection of prioritized disaster prone area based on the maps
4	February 1, 2008	13:30 - 17:00	Conference room, Study Team office, PEMKAB, Jember	9	Related Agencies[1] of SATLAK	- GIS software (ArcGIS) for creation of hazard and risk maps
5	February 5, 2008	13:30 - 15:00	Conference room, Study Team office, PEMKAB, Jember	11	Related Agencies[1] of SATLAK	- Countermeasures for prioritized disaster prone area
6	February 12, 2008	7:00 - 11:30	Conference room, Study Team office, PEMKAB, Jember	10	Related Agencies[1] of SATLAK	- Investigation of sediment-related disaster (Field work)
7	February 14, 2008	8:00 - 11:30	Conference room, Study Team office, PEMKAB, Jember	9	Related Agencies[1] of SATLAK	- Countermeasures in prioritized area
8	February 20, 2008	9:00 - 10:30	Conference room, Study Team office, PEMKAB, Jember	8	Related Agencies[1] of SATLAK	- Wrap up

1: National Unity and Public Protection Board, Public Works Agency, Transportation Agency, Irrigation Agency, Agriculture Agency, Forestry and Plantation Agency

(2) Kabupaten Padan Pariaman, Kota Pariaman and West Sumatra Province

A. Workshop in 2007

Activities for formulation of regional disaster management plan in the above model area were determined to start from May 2008. Thus, the main objectives of the workshops in 2007 in these areas were to share the information on the activities in Kabupaten Jember and to make them understand the process and necessary actions for formulation of the plan.

In addition to the workshops with the above objectives, as shown in the table below, key persons including Bupati of Kabupaten Padang Pariaman and Mayor of Kota Pariaman attended actively in joint seminars in Jakarta and also workshops in Kabupaten Jember; therefore, the base for the coming activities in 2008 was well-prepared at the time of 2007 in these area.

List of Workshops in Padang Pariaman, Kota Pariaman and West Sumatra Province in 2007

No.	Date	Time	Venue	Participants		Contents
				No.	Organization	
1	April 30, 2007	9:00 - 11:00	Conference room, SATKORLAK, Padang	27	SATKORLAK of West Sumatra	- Scope, objective, contents and methodology of the Study - Status of SATKORLAK and disaster management in West Sumatra
2	April 30, 2007	14:00 - 16:30	Conference room, Kabupaten Padang Pariaman	17	SATLAK in Kab. Padang Pariaman and Kota Pariaman	- Scope, objective, contents and methodology of the Study - Status of SATLAK and disaster management in Kabupaten Padang Pariaman and Kota Pariaman
3	August 13, 2007	9:30 - 12:30	Conference room, SATKORLAK, Padang	34	SATKORLAK SATLAK in Kab. Padang Pariaman and Kota Pariaman	- Structure of regional disaster management plan - Progress of regional disaster management plan in Jember - Topics and task for formulation of regional disaster management plan in Kab. Padang Pariaman and Kota Pariaman for next year activities

B. Workshop in 2008

For commencement of actual activities in Kabupaten Padang Pariaman and Kota Pariaman, both SATLAKs of Kabupaten and Kota organized counterpart teams and assigned members of the teams, to work closely together with the Study Team, in response to the request from the Study Team. Two kinds of teams, planning team and disaster team, were organized in each Kabupaten and Kota, and each team consisted of about five (5) members. Workshops were basically held separately targeting either the planning team or the disaster team.

Activities of each team and objective of workshop were as follows:

- Planning Team: Based on regional disaster management plan in Kabupaten Jember, the planning team modified and corrected it to be suitable for Kabupaten and Kota taking account of existing plans and current condition of Kabupaten and Kota. Modification and correcting work were conducted in each specified chapter by planning team according to the schedule, and the prepared chapters were confirmed and discussed between the planning team and the Study Team in regular workshops.

- Disaster Team: Together with the Study Team, the disaster team carried out information collection, field survey, discussion and investigation work regarding creation of hazard & risk maps and countermeasures. Activities in the workshops included the above-mentioned discussion and investigation as well as

technology transfer such as introduction of Japanese disaster countermeasures and methodology for creation of the maps.

Contents, target and outputs of each workshop are described below.

a) Workshop with Planning Team

Workshops with the planning team shown in the table below were held targeting at strengthening the following capacities:

- Capacity for formulation and updating of plan
- Capacity for coordination among organizations

The regional disaster management plan was prepared by counterparts themselves, while the Study Team gave advice, technical inputs, and explanation of background and meaning of each item of the plan, as required, in the workshop. Through the process of the work such as reviewing the plan of Kabupaten Jember, modifying the plan, and adding new contents by themselves, it is clearly judged that counterparts developed a better understanding of structure, contents, meaning, important items, and revising methodology of the plan, as well as importance of clarification of roles and responsibilities of organizations concerned and coordination among them, or activities to be implemented based on the plan in the future.

However, it is considered as a present issue that only the counterparts engaged in the work have enough understanding of the plan, whereas other SATLAK members and officials lack sufficient awareness of the plan. The plan should be publicized and explained to the people by counterparts in future.

List of Workshops with Planning Team

No.	Date	Time	Venue	Participants		Contents
				No.	Organization	
1	June 11, 2008	13:00 - 17:00	Conference Room in Kabupaten Padang Pariaman	10	SATLAK in Kab. Padang Pariaman and Kota Pariaman	- Schedule and methodology of formulating regional disaster management plan
2	June 17, 2008	13:00 - 15:00	Conference Room in Kota Pariaman	10	SATLAK in Kab. Padang Pariaman and Kota Pariaman	- Confirmation and discussion of specified part of regional disaster management, which are prepared by counterpart team
3	June 25, 2008	13:30 - 15:30	Conference Room in Kabupaten Padang Pariaman	6	SATLAK in Kab. Padang Pariaman and Kota Pariaman	- Confirmation and discussion of specified part of regional disaster management, which are prepared by counterpart team
4	July 2, 2008	13:30 - 15:30	Conference Room in Kota Pariaman	4	SATLAK in Kab. Padang Pariaman and Kota Pariaman	- Confirmation and discussion of specified part of regional disaster management, which are prepared by counterpart team

No.	Date	Time	Venue	Participants		Contents
				No.	Organization	
5	July 3, 2008	7:00 - 17:00	Field	19	SATLAK in Kab. Padang Pariaman and Kota Pariaman	- Field reconnaissance in hazard potential area in Kabupaten Padang Pariaman and Kota Pariaman
6	July 9, 2008	13:30 - 15:30	Conference Room in Kota Pariaman	5	SATLAK in Kab. Padang Pariaman and Kota Pariaman	- Confirmation and discussion of specified part of regional disaster management, which are prepared by counterpart team
7	July 23, 2008	13:30 - 15:30	Conference Room in Kabupaten Padang Pariaman	8	SATLAK in Kab. Padang Pariaman and Kota Pariaman	- Confirmation and discussion of specified part of regional disaster management, which are prepared by counterpart team
8	July 30, 2008	13:30 - 15:30	Conference Room in Kota Pariaman	10	SATLAK in Kab. Padang Pariaman and Kota Pariaman	- Confirmation and discussion of specified part of regional disaster management, which are prepared by counterpart team
9	August 19, 2008	13:30 - 15:30	Conference Room in Kota Pariaman	5	SATLAK in Kab. Padang Pariaman and Kota Pariaman	- Confirmation and discussion of specified part of regional disaster management, which are prepared by counterpart team - Program of wrap-up workshop
10	August 20, 2008	13:30 - 15:30	Conference Room in Kota Pariaman	5	SATLAK in Kab. Padang Pariaman and Kota Pariaman	- Confirmation and discussion of specified part of regional disaster management, which are prepared by counterpart team
11	Septem ber 5, 2008	13:30 - 15:30	Conference Room in Kabupaten Padang Pariaman	4	SATLAK in Kab. Padang Pariaman	- Confirmation and discussion of specified part of regional disaster management, which are prepared by counterpart team

b) Workshop with Disaster Team

Workshops with the disaster team shown in the table below were held targeting at strengthening the following capacities:

- Capacity for formulation and updating of plan, especially for hazard and countermeasures
- Capacity for implementation of measures

In workshops, technical topics regarding target disasters of earthquake, tsunami, flood and sediment disaster were discussed with counterparts, for example, a basic concept of hazard, risk and countermeasures learning from Japanese disaster management measures, importance of management for disaster data/information, methodology of creation of hazard & risk maps, concrete countermeasures, etc.

Owing to these workshops, the awareness of the counterparts was considerably raised especially for importance of collection and management of disaster related information, and methodology of disaster analysis. This could be clearly confirmed from the results of a counterpart interview.

Continuous disaster management activities led by the counterparts are expected to be done utilizing the knowledge and experiences acquired through the Study.

List of Workshops with Disaster Team

No.	Date	Time	Venue	Participants		Contents
				No.	Organization	
1	June 11, 2008	13:00 - 17:00	Conference Room in Kabupaten Padang Pariaman	11	SATLAK in Kab. Padang Pariaman and Kota Pariaman, others	- Introduction and explanation of Japanese disaster management measures for earthquake, sediment disasters and flood - Confirmation of present status of disaster management measures in Kab. and Kota
2	June 19, 2008	13:00 - 15:00	Conference Room in Kota Pariaman	13	SATLAK in Kab. Padang Pariaman and Kota Pariaman	- Introduction and explanation of Japanese disaster management measures for tsunami
3	July 3, 2008	7:00 - 17:00	Field	19	SATLAK in Kab. Padang Pariaman and Kota Pariaman	- Field reconnaissance in hazard potential area in Kabupaten Padang Pariaman and Kota Pariaman
4	July 9, 2008	10:00 - 17:00	Field	5	SATLAK in Kota Pariaman	- Field Survey
5	July 10, 2008	10:00 - 12:00	Conference Room in Kota Pariaman	15	SATLAK in Kab. Padang Pariaman and Kota Pariaman, others	- Hazard map and countermeasures for earthquake
6	July 16, 2008	10:00 - 17:00	Field	5	SATLAK in Kab. Padang Pariaman	- Field Survey - Actual condition and future plan of countermeasures against tsunami
7	July 25, 2008	10:00 - 12:00	Conference Room in Kota Pariaman	8	SATLAK in Kab. Padang Pariaman and Kota Pariaman	- Formulation of Tsunami hazard map
8	August 19, 2008	13:00 - 15:30	Conference Room in Kota Pariaman	7	SATLAK in Kab. Padang Pariaman and Kota Pariaman	- Present status and future plan for collection of disaster related information - Program of wrap-up workshop
9	Septem ber 8, 2008	13:30 - 15:30	Conference Room in Kota Pariaman	9	SATLAK in Kab. Padang Pariaman and Kota Pariaman	- Hazard & risk map and countermeasures for flood and sediment disaster
10	Septem ber 10, 2008	13:30 - 15:30	Conference Room in Kota Pariaman	8	SATLAK in Kab. Padang Pariaman and Kota Pariaman	- Explanation of GIS database - GIS training

c) Common Workshop

In addition to the above workshops with planning team and disaster team, two large workshops shown in table below were held. One is a kick-off workshop targeting to SATKORLAK in West

Sumatra, and SATLAK members in Kabupaten Padang Pariaman and Kota Pariaman, and the other is a wrap-up workshop targeting to SATLAKs of other districts in West Sumatra Province as well as SATKORLAK in West Sumatra, and SATLAK members in Kabupaten Padang Pariaman and Kota Pariaman.

In particular, the wrap-up workshop was held: 1) to publicize and explain regional disaster management plans as outputs of the activities of the Study, to SATLAK members of Kabupaten Padang Pariaman and Kota Pariaman, 2) to publicize and explain the plans to other districts in West Sumatra Province in order to promote formulation of similar plans in those districts, and 3) to discuss a role of SATKORLAK in West Sumatra for promoting formulation of the plans as well as coordination among Province and districts. BNPB was also invited to the workshop to understand activities for formulation of the plan in regional area and to expand these activities to all the districts in Indonesia.

In the wrap-up workshop, regional disaster management plans of Kabupaten Padang Pariaman and Kota Pariaman were distributed to all the participants totaling 120 persons, and counterparts presented and explained disaster characteristics and the plan of each Kabupaten and Kota. In a free discussion in the last session of the workshop, there was active discussion toward future concrete activities. For example, the participants discussed a process of formulating and authorizing regional disaster management plan and the role and responsibility of the Province for the process; also SATLAK members participating from other Kabupatens and Kotas strongly requested support for the activities from the Province. It can be said that this workshop contributed to enhance opportunities for formulation of regional disaster management plan in other districts in West Sumatra Province.

List of Common Workshops

No.	Date	Time	Venue	Participants		Contents
				No.	Organization	
1	May 30, 2008	9:00 - 12:00	Conference Hall in Kota Pariaman	71	SATKORLAK in West Sumatra SATLAK in Kab. Padang Pariaman and Kota Pariaman,	- Kick off meeting - Scope and schedule of activities for formulating regional disaster management plan - Structure and important items of regional disaster management plan - Assignment of counterpart member
2	Septem ber 11, 2008	9:00 - 15:00	Hotel Pangeran Beach, Padang	120	BNPB, SATKORLAK West Sumatra, SATLAK in Kab. Padang Pariaman, Kota Pariaman and other districts, Andalas Univ., JICA	- Wrap-up workshop - Hazard and risk of natural disaster in Kota Pariaman and Kab. Padang Pariaman - Regional disaster management plan in Kota Pariaman and Kab. Padang Pariaman - Discussion on coordination among Province, Kabupaten and Kota, and future activities and cooperation to formulate regional disaster management plan in other districts in West Sumatra Province

4) Counterpart Training in Japan

Overseas training is one of the most effective capacity development activities. JICA training programs for the counterpart members of this Study were conducted from 27th of August to 7th of September 2007. Main objectives of the counterpart training were: 1) to comprehend the concrete plan and actual examples of disaster management in Japan, and 2) to utilize the acquired knowledge and experience for formulation of disaster management plan.

In order to achieve the main objectives, the program was planned for the counterparts to be able to understand and acquire the following knowledge.

- Disaster Risk Management system in Japan by visiting selected concerned organizations
- One of the ways for disaster education is by visiting the memorial, educational and training facilities on Disaster Risk Management
- Importance of drills and exercises for Disaster Risk Management by inspecting actual role playing exercise and onsite comprehensive disaster management drill.
- Effectiveness of structural measures for natural disasters evaluated during field trip.

The participants for this training were as follows:

- Dr. Syamsul Ma'arif	Chief Executive	BAKORNAS PB
- Mr. Sugeng Triutomo	Director for Disaster Mitigation	BAKORNAS PB

- Ms. Dewina Nasution	Director for Building Capacity	BAKORNAS PB
- Mr. Abdul Hamid	Head of Protection Community	SATKORLAK East Jawa
- Dr. Marlis Rahman	Vice Governor	SATKORLAK West Sumatra
- Mr. Muhamad Fadhallah	2nd Assistant of Bupati	SATLAK Kab. Jember
- Dr. Muslim Kasim	Bupati Kab.Padang Pariaman	SATLAK Kab. Padang Pariaman
- Mr. Mahyuddin	Mayer	SATLAK Kota Pariaman

According to interviews of some of the participants, the participants seem to be satisfied about the training program and learned a lot of things from the training.

For smooth and prompt implementation of activities for disaster management as well as formulation of disaster management plan, it is considered key that the head of the organization or local government confirms or comprehends the necessity and effect of the plan. In this training, all the participants are key persons for disaster management in each organization or local government. In fact, in Kabupaten Jember, 34 loudspeakers for early warning were installed in mosques inside of the hazardous area after the training; this was a lesson learned from the early warning system in coastal area of Kobe city.

Moreover, from Kabupaten Padan Pariaman and Kota Pariaman, the head of each local government participated in the training. They enhanced awareness of disaster management in the training, and also took part in the joint seminar in Jakarta subsequent to the training; Bupati of Kabupaten Padang Pariaman also participated in the workshop for regional disaster management plan on 29th January, 2008 in Kabupaten Jember. In addition, in Kabupaten Padang Pariaman, the budget related to disaster management has been increased to three to four times from last year's one according to decision by Bupati after he participated in the training. Also, according to the instruction of Bupati, tsunami education materials were prepared based on "Inamura no Hi" (Japanese famous true story for tsunami education), and were distributed to residents in Kabupaten Padang Pariaman.

It is concluded that the training was successful and effective not only for capacity development of participants but also for activation of disaster management activities through enhancement of disaster management awareness of participants.

Training Program in Japan

Date		Venue & Route	Program
25-Aug	Sat	Jakarta →	
26-Aug	Sun	→Narita	
27-Aug	Mon	Tokyo	AM Orientation in JICA PM Disaster Management Center (Tokyo Fire Department)
28-Aug	Tue	Tokyo	AM Disaster Risk Management in Japan (Cabinet Office) PM Weather and Rainfall Forecasting (JMA)
29-Aug	Wed	Tokyo	Public Works Research Institute (Experimental Facilities)
30-Aug	Thu	Nagano	PM Landslide Countermeasures (Nagano Prefecture)
31-Aug	Fri	Tokyo	AM Flood Information System (FRICS) PM Disaster Risk Management Role Playing Drill (Ministry of LIT Kanto Region)
1-Sep	Sat	Tokyo	AM Disaster Risk Management Drill (Metoropolitan Region)
2-Sep	Sun	Kobe	Reporting
3-Sep	Mon	Kobe	AM Flood Control (Yamatogawa River Management Office) PM ADRC Activities (Asia Disaster Reduction Centre)
4-Sep	Tue	Kobe	AM Disaster Management Center (Kobe City) PM Emergency Response (Kobe City)
5-Sep	Wed	Wakayama	Tsunami Countermeasures (Wakayama Prefecture)
6-Sep	Thu	Kobe	AM Hyogo Prefecture Seismic Technology Centre
7-Sep	Fri	Tokyo	AM Reporting (PCI) PM Evaluation (JICA)
8-Sep	Sat	Narita→Jakarta	

4.1.2 Capacity Development of Communities

Leader training and workshops in selected pilot communities were conducted with the aim of capacity development of community leaders and community members in model areas of Kabupaten Jember, Kabupaten Padang Pariaman and Kota Pariaman. The details of activities, outcomes and so on are described in section 3.4 of this report. Their outcomes are considered to be sufficient because the activities in this Study not only enhanced the capacity of community leaders and members but also expanded disaster management activities by governmental organization including SATLAK. For example, SATLAK of Kabupaten Padan Pariaman plans to hold community workshops by its own budget referring to the program in this Study.

4.2 Public Relations and Public Awareness Activities

Public relations and public awareness activities has been carried out in order to widely announce contents and proposals of the Study, to improve the sense of participation of parties concerned including residents, and to enhance pubic awareness of disaster management. These activities have employed various media such as radios, newspapers, flyers, newsletters, calendars, posters, websites, etc., so as that information reaches to people at all levels of society.

The following public relations and public awareness activities have been done through the Study:

1) Preparing and distributing newsletters

- The 1st newsletter

The 1st newsletter with 8 pages of A4 size full color was prepared in July 2007; it included the introduction of the Study such as objective, scope, Study Area, organization and Study members, and the chronological activities of the Study up to July. The newsletter was distributed to concerned organizations and people by counterparts.

- The 2nd newsletter

The 2nd newsletter was prepared in February 2008; it included the introduction of the activities of the Study mainly in Kabupaten Jember such as workshop on regional disaster management plan, technical workshops, leader training, community workshop, counterpart training in Japan, and mascot competition. The newsletter was distributed to concerned organizations and people by counterparts.

- The 3rd newsletter

The 3rd newsletter will be prepared in December 2008; it will include the introduction of the Study activities at regional level in Kabupaten Padang Pariaman and Kota Pariman such as joint field reconnaissance, wrap-up workshop on formulation of regional disaster management plan, leader training, community workshop and mascot competition, as well

as national level activities of workshop on national disaster management plan. It also includes interviews to Bupati of Kabupaten Padang Pariaman and counterparts about cooperation work with the Study Team.

2) Constructing and publishing a website

The Website of the Study was constructed in 2007 in the website of BAKORNAS PB in order to publicize the contents of the Study and its activities via the internet.

3) Developing and Distributing the Leaflets for Disaster Awareness

Disaster awareness leaflets for four kinds of disasters, i.e., flood, sediment disaster (landslide, mud flow, debris flow and so on), earthquake and tsunami were developed for utilization in the community workshops in selected pilot communities and distribution by leaders in the targeted communities in model areas of Kabupaten Jember, Kabupaten Padang Pariaman and Kota Pariaman.

The contents of each leaflet covers basic information of disasters and disaster risk management such as: i) mechanism of the hazards, ii) signs and early warnings, iii) prevention/mitigation and preparedness, iv) emergency response, and v) contact information in case of occurrence of disasters.

100 copies each of 4 leaflets were provided to each of community leader in the targeted communities for utilization in their community activities.

4) Developing and Distributing the Calendars for Disaster Awareness

The calendar for disaster awareness was developed with the similar contents of the above-mentioned leaflets in Kabupaten Jember.

Of the 3,000 sets of calendars prepared, 70 sets each (total 2,170 sets) were provided to all of 31 Kecamatans in Kabupaten Jember. They were distributed and put in public places such as meeting halls in desa, dusun and RT/RW, and official offices. The remainer were provided to each organization belong to SATLAK of Kabupaten Jember.

It is considered that the calendar will contribute to enhance awareness of disaster management by allow people to view the knowledge, actions and preparedness for disaster on a daily basis.

5) Contest of Mascot for Disaster Awareness

(1) Kabupaten Jember

Aiming at enhancement of public awareness for disaster management, a contest for mascot for disaster awareness was advertised in Jember during January and February, 2008 through newspapers, private radios, handbills and banners along roadsides in collaboration with SATLAK and NGO.

In total 43 persons submitted 120 mascots. Regardless of the short advertising period, the number of applications exceeded expectations.

Through careful examination by Study Team, SATLAK and NGO on 13th February, the following three mascots were selected for awards.

The First Award

The Second Award

The Third Award

The concept of the mascot of the first award is a leaf of tobacco which is a special local product of Jember, using kenthongan as an information dissemination tool.

The Awarded mascot has been used in banners in roadsides and newspapers. An award ceremony was held at the end of February 2008 and the prizes were given to winners by Bupati and the Study Team.

After the contest, many activities using this mascot are planned to be conducted lead by SATLAK, such as creating animation, making T-shirts with the mascot, town walking with the T-shirts, reforestation activities with the T-shirts and so on.

It can be concluded that this kind of activity is highly effective for enhancement of disaster awareness not only for people, but also for disaster management organizations such as SATLAK.

(2) Kabupaten Padang Pariaman and Kota Pariaman

Mascots for disaster awareness were advertised in Kabupaten Padang Pariaman and Kota Pariaman from July to August 2008 through newspapers, private radios, handbills and banners in the roadside in collaboration with SATLAKs.

In total 8 persons submitted 33 mascots in Kabupaten Padang Pariaman, and 26 persons submitted 49 mascots in Kota Pariaman.

Through the careful examination by Study Team and SATLAK on 5th August, the following mascots were selected for awards.

The First Award in Kab

The Second Award in Kab

The Third Award in Kab

The First Award in Kota

The Second Award in Kota

The Third Award in Kota

The concept of the mascot of the first award in Kabupaten Padang Pariaman is a coconut with Minang Kabau's traditional clothing and a gong as an indigenous information dissemination tool in West Sumatra. On the other hand, the concept of the mascot of the first award in Kota Pariaman is a ship with Minang Kabau's traditional clothing and a gong. Kota Pariaman is on the sea, so a lot of applied mascots were related to the sea.

The Awarded mascots have been publicized by banners in the roadside and newspaper. Award ceremony was held on 17th August 2008 and the prizes were given to winners by Bupati of Kabupaten Padang Pariaman, mayor of Kota Pariaman and the Study Team.

Kabupaten Padang Pariaman made T-shirts and badges with the mascot, and a mascot costume soon after the contest. Bupati and SATLAK of Kabupaten Padang Pariaman plan to utilize the mascot in various activities related to disaster management in the future.

6) Public Relations through Newspapers

Articles on the Study, which were published in newspapers, are listed in the table below.

List of Newspaper Articles

No.	Date	Newspaper Name	Title of Article	Contents
1	June 13, 2007	POLOTIKA&LAY ANAN PUBLIK	Disaster Management Program is implemented - Collaboration with Japan and Jember	Workshop on JICA Study was held, and JICA Study Team explained contents and activities of the Study.
2	September 24, 2007	POLOTIKA&LAY ANAN PUBLIK	Objective of JICA Study in Jember	Disaster is investigated and hazard map is created. How to utilize these results for residents, and how to activate disaster management activities in Jember, were discussed in workshop.
3	January 30, 2008	RADAR Jember	Regional Disaster Management Regulation is necessary - Support by Japanese Consultant	Workshop on formulation of regional disaster management plan was held. BNPB explained necessity of plan and regulation on disaster management, and Bupati mentioned usefulness of JICA Study.
4	February 25, 2008	RADAR Jember	Mascot of Disaster Management	Award ceremony of mascot of disaster management was held. Bupati expressed appreciation for activities of JICA Team.
5	August 14, 2008	Pos METRO Padang/SINGGALANG	Result of Mascot Competition	Mascots of disaster management were selected in Kabupaten Padang Pariaman and Kota Pariaman. Award ceremony is held on August 17.

CHAPTER 5 CONCLUSIONS AND RECOMMENDATIONS

As a result of the Study on Natural Disaster Management in Indonesia by JICA, the Study Team has several recommendations to support their disaster management planning and activities for BNPB (former BAKORNAS PB), SATKORLAK and SATLAK in pilot regions, the counterpart agencies of Indonesia.

1) For the first time in Indonesia, the National disaster management plan and Regional disaster management plan for pilot regions were compiled to cover earthquake including Tsunami and Rain and Storm disaster. The responsible agencies of disaster management in Indonesia at all levels (National, Provincial, Kabupaten and Kota levels) should thoroughly read this disaster management plan, so that necessary disaster mitigation measures for future possible disaster can be taken before disaster occurrence. Preparedness is the very essence to reduce disaster damage.

   The disaster management plan should be updated regularly once every 5 or 10 years according to change of urban/regional land use and socio-economic conditions, and reviewed when necessary; especially if a big disaster occurs. In the case of Japan, the national disaster management basic plan has been revised seven times including overall revision twice.

2) The disaster management plans, which Study Team helped BNPB, SATLAK and other relevant government agencies to formulate, covers only four (4) types of natural disaster (*i.e.* Flood disaster, Sediment disaster, Earthquake disaster and Tsunami disaster). It is recommended that BNPB and SATLAK formulate a comprehensive plan based on the lessons learned and experiences of the Japanese plan because in terms of the climate, geographical condition and hazard type, Indonesia and Japan have a lot in common and the Japanese plan is easy to apply to other disaster types that are not referred to in the Plans formulated in this Study.

   Especially for national disaster management plan, BNPB should take the lead and incorporate all disaster types and formulate a comprehensive national disaster management plan.

3) In a plan for other disasters, which will be added to these disaster management plans, the activity areas for each disaster phase including emergency response, recovery, rehabilitation, preparedness and mitigation have to be clearly described, and for each activity area, the plan needs to identify the stakeholders that are responsible for each area.

4) National disaster management plan should be referred to in the preparation of local disaster management plans. Once BNPB formulates the National Plan, BNPB will take the lead to coordinate the local disaster management plan to maintain consistency between the national and the regional plans.

5) A disaster management operations plan/manual needs to be formulated for use when people are actually implementing the actions that are stipulated in the national and regional disaster management plans. Operational plans need to be formulated by each government ministry, agency, local government and entities where national and/or regional disaster management plans identify some actions. The plan/manual should be distributed to all responsible agencies. Based on it, disaster management drills such as emergency response should be practiced regularly at the national, provincial, and local levels.

6) Concerning the local disaster management plan, Kabupaten Jember, Kabupaten Padan Pariaman and Kota Pariaman were selected as pilot project areas for this Study. The final results of regional disaster management plan including planning know-how should be disseminated to Provinces in East Java and West Sumatra and related municipalities so they can establish the necessary coordination among disaster management agencies regarding responsibilities of relevant agencies, versatile applications of the plans at related municipalities in the provinces, *etc*.

7) Collection and preparation of detailed scientific data to support practical planning work is necessary. In this study, the maximum level of detailed topographic map data that the study team could obtain was 1:25,000 and 1:50,000 scale maps which were compiled many years ago by BAKOSURTANAL and the military map agency. For example, in west Sumatra, contour data is not available for interval and detailed elevation data of lowland area below 20m. This is a problem because if the tsunami invasion height is set at 5 meters, there is no data to define the limits of tsunami inundation area. What should be prepared is a large scale topographic map at 1:2,000 or 1:5,000 which is showing detail elevation such as 1 or 2 meters at least in coastal lowland area including settlement/urbanized area. Such large scale topographic map is necessary basic material not only for future tsunami disaster management planning but also for flood disaster management, urban land use planning and infrastructure development. In addition to compilation of large-scale topographic map, geological data compilation is also necessary for damage analysis for earthquake, land collapse and landslide.

   For socio-economic data, CENSUS data is key information for regional planning. In case of detailed regional planning, the data collection unit must cover at least the village level; however, village (desa) boundary data is sometimes unclear on the map. This fact affects

on data analysis on existing socio-economic condition of study area. This type of data discrepancy in administrative unit should be solved soon by both national and local government agencies.

8) For flood disaster management, collection of at least rainfall data by main watershed is necessary. Rainfall observation points should be increased and observed rainfall data should be collected through a network system for analysis as the basis for early warning against flooding. Water level observation of rivers is also necessary for flood disaster management as basic information. Data integration and database development of rainfall and hydrological conditions should be promoted to provide a scientific base for disaster management plans at both national and regional level.

9) Furthermore, accumulation of historical disaster data, such as earthquake, tsunami disaster, flood area, land collapse/landslide area, is very important. At present situation, the most of past disaster data are scattered and lost in a poor arranged manner at any relevant agencies. In short, there are problems in terms of data collection, accumulation and management. For instance, the data of the disaster event (*e.g.* flood area, flood duration, *etc.*) are insufficient or incomplete and there are no sufficient accumulation of past disaster data. In addition, there is no unified format of disaster data and reliable data management system. Thus, it is quite difficult to consider how to utilize the disaster data for disaster reduction activities. It is difficult to delineate the highly disaster prone areas and to clarify the relations with socio-economic condition and natural condition. Disaster data accumulation should be promoted at national and local levels using specific format and obtaining accuracy. Disaster data accumulation will significantly give support to the preparation of necessary disaster mitigation measures.

10) In this project, JICA study team developed GIS database for hazard mapping and disaster risk analysis. The whole GIS system including computer, software and data will be totally transferred to Kabupaten Jember , Kabupaten Padan Pariaman and Kota Pariaman. Basic methodology for hazard mapping and risk analysis including data collection, field survey, data digitization, geographic database development, analysis and output mapping are explained in the Supporting Report. Geographic database system for disaster management should be effectively used for planning work in each agency. In the future, an application system should also be developed by each agency such as land use zoning, spatial planning, environmental zoning and natural resource management.

11) Promotion of community based disaster management is one of the key issues in local disaster management. Disaster prevention drills including evacuation, rescue operation, fire fighting, stock of water, food and medicine, and so on should be conducted for the

community unit. Public awareness on disaster management should be raised through school education and community disaster management activities lead by national and local government.

12) In order to support disaster damage reduction activities by government and community, existing capacity of firefighting including improvement of equipment, rescue operation system and human resource development should be promoted.

13) Emergency medical service system should also be improved. Human resource development for doctors, nurses, and related experts is necessary for emergency response to a large disaster such as a big earthquake. Based on the tertiary hospitals in each province, improvement program preparation and training for disaster medical services should be promoted. Import of the latest international knowledge and information for disaster medical services is recommended.

14) Preparation of earthquake disaster management plan for large cities such as Jakarta Metropolitan Area, Bandon, Medan and local capital cities located earthquake prone area should be promoted. Damage estimation based on micro-zoning methodology for a big city should be conducted to grasp the necessary input for both physical and non-physical mitigation measures.

15) Disaster management in big cities located at coastal area should be discussed from the global warming point of view. In Jakarta Metropolitan Area, land subsidence has been progressing especially in coastal areas. Flood and inundation disasters will occur in wider areas and water stagnation will continue longer due to such land subsidence. These phenomena will be exacerbated by sea level raising by effects of global warming over the medium to long term. Necessary mitigation measures should be discussed as a part of natural disaster management.