

Mainstreaming Disaster Risk Reduction into National Development Planning – Housing Sector



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January – April, 2014

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Acknowledgement

Firstly, I would like to acknowledge the support of the Government of Islamic Republic of Iran and Asian Disaster Reduction Center (ADRC) for providing me with the opportunity to attend this Visiting Researchers Program.

My special thanks to Mr, Mohammad Hosseini Director General for International relations of National Disaster management Organization of Iran for nominating me to attend VRFY2013B program.

I am particularly grateful to my wife for her support and her feedback in writing this report.

Finally, I take this opportunity to express profound gratitude to the ADRC staff members and my visiting researcher colleagues for extending their professional support during the program.

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Abbreviations & Acronyms

ADRC	Asian Disaster Risk reduction
ADPC	Asian Disaster preparedness Centre
BMTPC	Building Materials & Technology Promotion Council
BSL	Building Standard Law in Japan
DRR	Disaster risk reduction
DP	Disaster preparedness
DPC	Disaster preparedness committee
DRM	Disaster risk management
EIA	Environmental Impact Assessment
HFA	Hyogo Framework for Action
IEC	Information, education and communication
IEE	Initial Environmental Examination
JASS	Japan Architectural Standard Specification
DRRI	Disaster Risk Reduction Initiatives
MDG	Millennium Development Goals
MLITT	Ministry of Land, Infrastructure, Transport and Tourism
NDMO	National Disaster Management Organization
PPAs	programs, projects, and activities
SPAS	Strategic Planning and Supervision
UNDP	United Nation Development Program
UNISDR	United Nation for International Strategy for Disaster Reduction
WCDR	World Conference on Disaster Reduction

Introduction

In the recent years, high economic growth in some countries with unplanned development has created new risks and precipitated existing vulnerabilities. It sometimes increase marginality in large cities which makes a large number of people highly vulnerable to natural and human induced disasters. At the time of disasters, because of scarce resources, the governments have to divert their focus from development to relief and rehabilitation, which further creates set back to the development.

It is necessary to retrofit all the existing development activities for reducing the threats of impending disasters. Additional costs involved shall always be far less than the benefits accruing from such investments.

At the World Conference on Disaster Reduction (WCDR) which was held at Hyogo, Japan in January 2005, 168 countries had committed to integrate risk reduction into development policies and plans at all levels of Government including poverty reduction strategies, and multi-sectoral policies and plans in line with Hyogo Framework for Action (2005-2015).

Disasters and development are co-related in terms of negative and positive impacts. Depending on the level of development happening, disasters can set back the developments and the achievements of long-term development efforts may disappear in an instant. The preventive measures against disasters are always highly cost efficient. At the same time, it can also be taken as a unique opportunity to reduce vulnerabilities. However, natural disasters stand as one of the main challenges to achieve Millennium Development Goals (MDGs).

So, development activity and Disaster Risk Reduction (DRR) representing two sides of the same coin needs to be dealt with in unison. While natural disasters cannot be prevented from happening, the vicious cycle of disasters and its effects in the development activity can be altered. This can be done through mainstreaming disaster risk reduction in the development process as shown in Figure 1.

The lack of consideration of DRR into development process leads to bearing extra costs in reconstruction which perpetuates the conditions for unsustainable development and shifts the scarce resources originally programmed for development into relief and response.

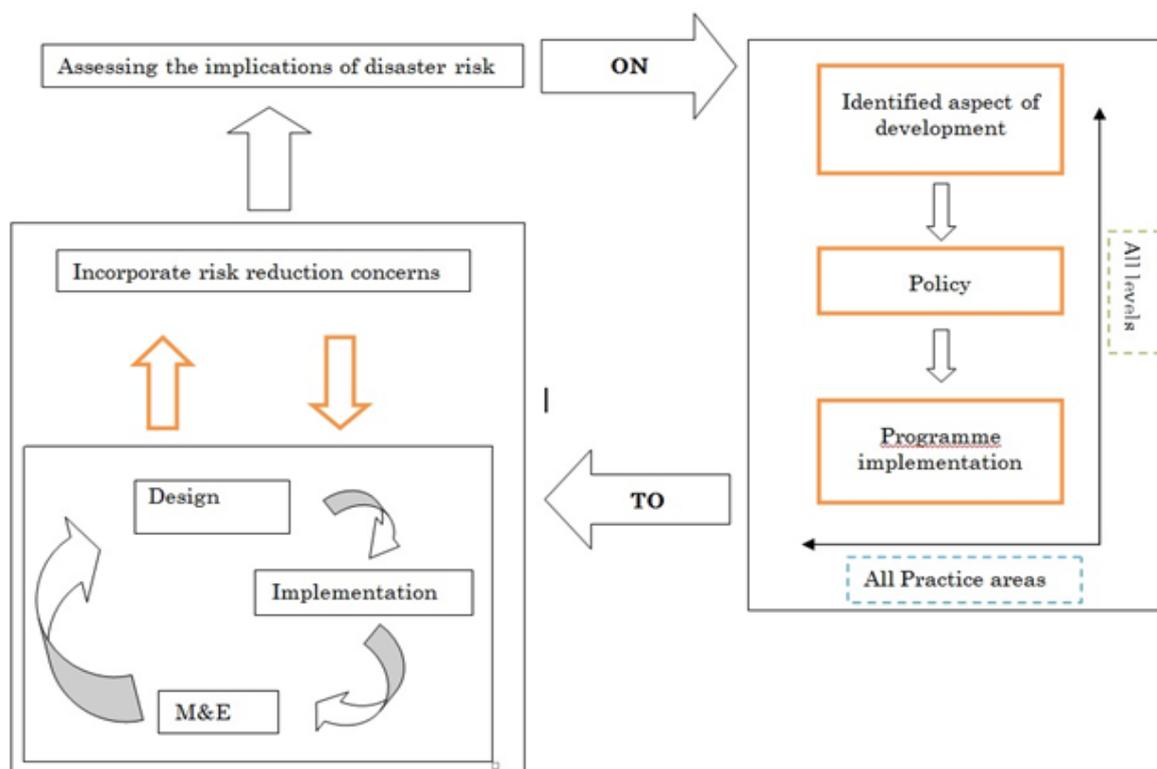


Figure 1. Process of DRR Mainstreaming, (Twigg, 2004)

Mainstreaming DRR in Development Planning

The aim of planning is to make sure that people are better than they were before. In mainstreaming DRR in planning, one can guide development and allocate resources toward the protection of life and assets, restoration of productive systems and livelihoods, regaining market access, and rebuilding social and human capital and physical and psychological health. Development plans therefore take on a critical role in disaster risk management (UNDP, et al, 2008).

The development planning process is comprehensive, multispectral and integrative. “Mainstreaming DRR into development means to consider and address risks emanating from natural hazards in medium-term strategic frameworks and institutional structures, in country and sectoral strategies and policies and in the design of individual projects in hazard-prone countries” (Benson, et.al, 2007).

It also considers and addresses risks emanating from natural hazards in medium-term strategic frameworks, institutional structures, country and sectoral strategies, and policies in

the design of individual projects in hazard-prone countries (Benson, et.al, 2007).

As shown in the Figure 2, the process covers plan preparation, investment programming, project evaluation and development, budgeting, implementation, and monitoring and evaluation.

It starts with identifying development strategies based on an analysis of the region or province. These are translated into programs, projects, and activities (PPAs) that serve as the main inputs into the investment programming processes. Based on a predetermined set of criteria, these PPAs are further screened and ranked to produce the multiyear investment programs and the annual investment program.

The investment programs, aside from ranking the priority PPAs, indicate the year(s) in which each PPA will be implemented and at what cost. Should available funds be insufficient to implement a PPA, measures to generate additional revenues to finance the PPA can be identified. Funds are then allocated and the implementation proceeds for the target year. Programs and projects are evaluated to determine their costs and benefits, feasibility and prospective contributions to society, among others. When implemented, PPAs are monitored and evaluated and the results will be inputs to the next cycle of planning. With DRR assessment conducted within subnational planning, planners may:

1. Take a comprehensive view of the physical, economic, social, environmental and institutional interrelationships and understand what constitutes the susceptibility of a region or province to risks from natural hazards;
2. Integrate DRR management decisions in the spatial framework, i.e., risk mitigation, risk prevention, risk transfer and risk retention; and
3. Carry out the DRR-enhanced PPAs in their investment programs that are:
 - Designed with consideration for potential disaster risks and to resist hazard impact;
 - Designed not to increase vulnerability to disaster in all sectors: social, physical, economic and environment; and
 - Designed to contribute to developmental aims and to reduce future disaster risks.

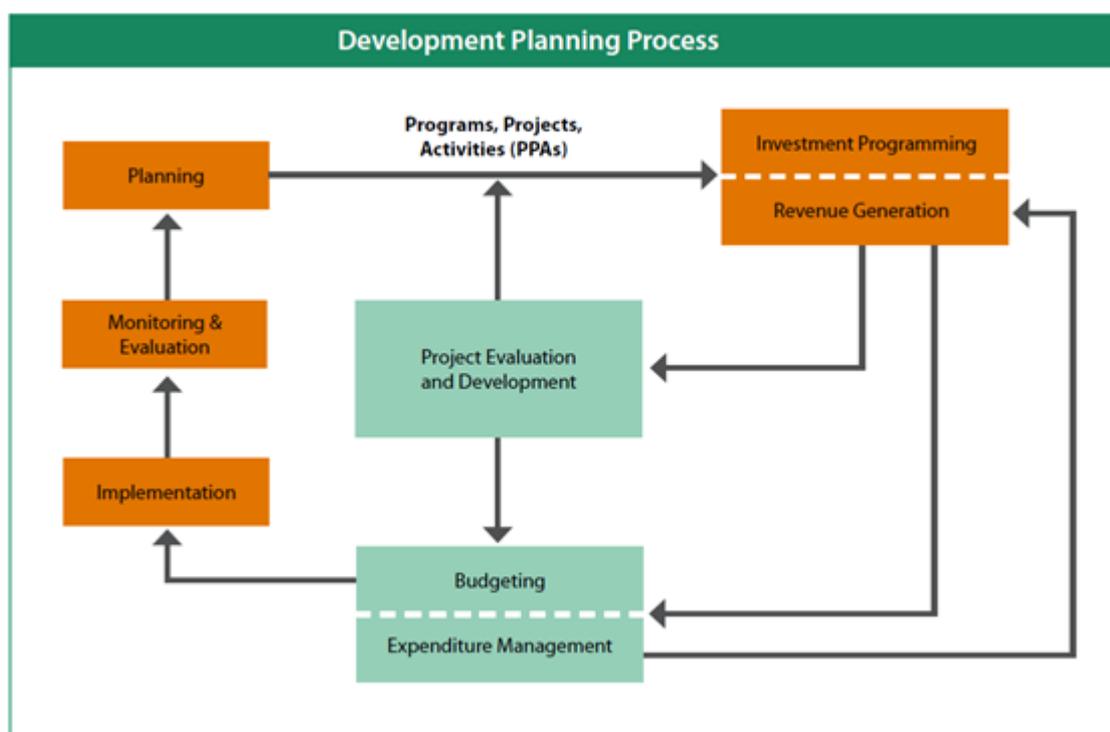


Figure2: Source: NEDA -ADB, 2007 in UNDP, et al, 2008

Opportunities

The opportunities of mainstreaming DRR in development planning have following advantages:

1. It prepares land use plan, so can guide private sectors, government to undertake large scale projects, on the proper location of their projects and the implementation of the necessary mitigation works.
2. Planning output can offer policy options and generalized programs and projects which the next level stakeholders, can work on the subsequent more detailed planning work.
3. Mainstreaming DRR addresses disaster issues as a cross-cutting dimension of development and goes beyond hazard impact mitigation to a more comprehensive analysis of its implications to development.
4. It helps in decision making of allocation and prioritization of available resources in development planning at local level.
5. It attracts and keeps track of all the stakeholders in one basket thus reducing duplication in projects.
6. It helps to better respond to disaster.
7. Advance planning and the implementation of appropriate development strategies can

- significantly reduce the labour and cost of rescue, relief, resettlement and reconstruction.
8. It helps to fulfil the national and international goals and objective like MGDs to reduce poverty, promote environmental sustainability and etc.
 9. Community based disaster risk management plan will sensitize public on disaster risk reduction and will help to reduce poverty.
 10. It promotes Risk sensitive land use planning, Land pooling & land development; Implementation of building code; Capacity building of municipal officers, engineers, contractors, masons; Strong and sound field monitoring system; Awareness raising for individuals in DRR through social mobilization.
 11. Involve college, schools and other academics; Involve govt. agencies, NGOs, private sectors with effective coordination mechanism; Endorsing PPP concept; Vulnerability mapping will be done by the municipality and retrofitting of old buildings and demolishing old building. (Loy Rego, Arghya Sinha Roy, 2007)

At this Research, I focus on mainstreaming DRR in housing sector.

Why Housing?

Housing is considered as one among the three basic human needs next to food and clothing. Importance of housing cannot be understated as it is a key factor determining a person's health, wellbeing, and prospects in life. There is an often-repeated saying, "earthquakes don't kill people, and buildings do". At earthquake time the some buildings severely affects by one.

Factors contributing to vulnerability of building stock

- Poor land use planning /with poor understanding on hazards / without risk based planning
- Lack of knowledge and incorporation of appropriate disaster resistant features during planning and construction process
- Lack of regulatory mechanism to enforce land use / building regulations
- Limited / no mechanism for accountability in case of violation of regulations
- Lack of skilled human resources in planning and execution
- Poor quality and sub-standard building materials
- Poor maintenance of structures
- Poor governance – corruption (ADPC, 2011)

Mainstreaming DRR in Housing Sector

Irrespective of the nature of hazards, disaster losses associated with housing sector are due to underlying risk factors and the subsequent sections discuss the rationale and entry points for mainstreaming disaster risk reduction into the housing sector.

Mainstreaming DRR in housing would mean that all housing related interventions have considered the effect of natural hazards (current as well as future risks magnified by climate change) and of the impact of those interventions in turn, on vulnerability to natural hazards, and accordingly have adopted risk reduction measures. This would require understanding the typical vulnerabilities to hazards, analyze how these vulnerabilities interact with the existing processes of development of the sector and understanding of the actors involved in each of the processes.

Figure 3 shows the possible entry points into housing components and enabling environment frameworks for DRR interventions in the housing development process which can result in varying degree of impact. Mainstreaming efforts aiming at frameworks will benefit long-term housing delivery process; small steps within a shorter timeframe can also be made for immediate advancement by addressing the specific components on a case by case basis such as during new housing / reconstruction programme and replicate or upscale the process.

In addition it should be noted that, mainstreaming is not done as an isolated effort, each entry point interacts with the others framework / components which support the process. As indicated above various actors are involved directly and indirectly in housing development process. Many different agencies at national and local levels should collaborate for efficient mainstreaming of DRR in housing. However any effort to mainstream DRR has to focus at long term process for successful integration and outcome.

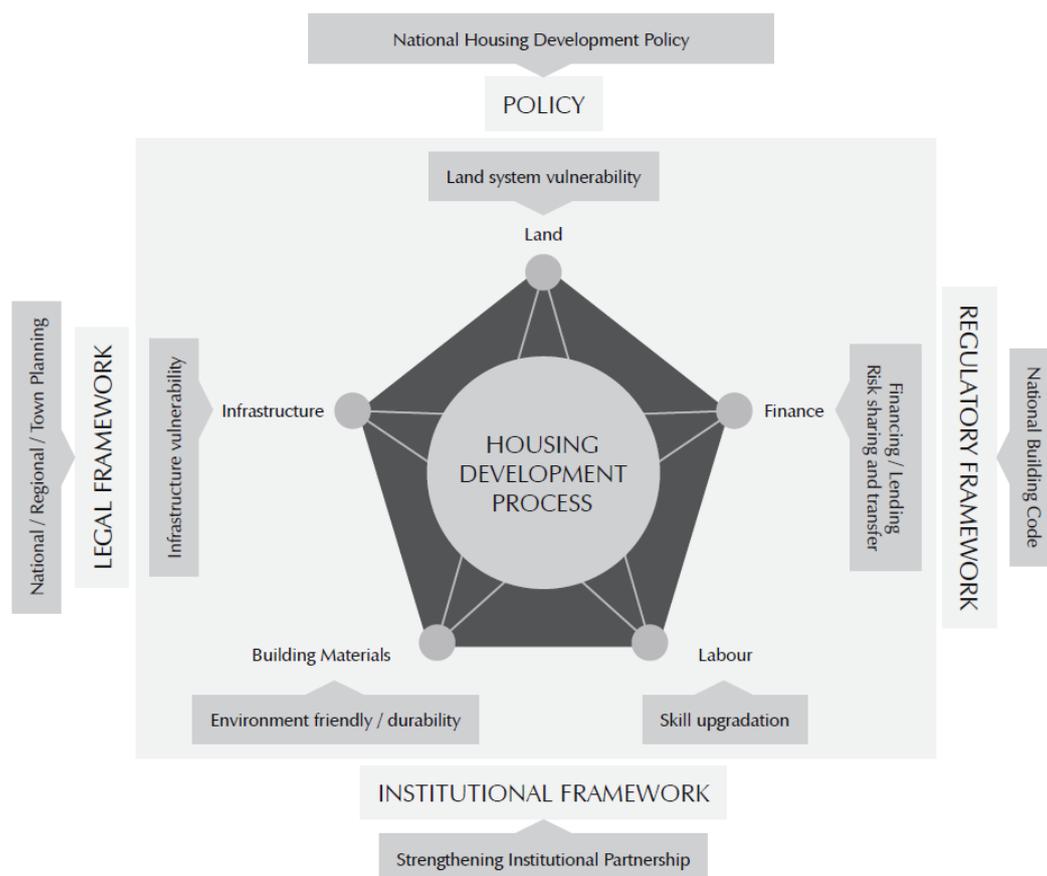


Figure3 A typical process of housing development and possible entry points and enabling Environment to mainstream DRR (ADPC, 2011)

At a strategic level mainstreaming entails addressing / incorporating DRR measures in policies, regulations while at operational level undertaking specific measures such as evaluation of hazards, vulnerability and risks and addressing it through appropriate mitigation measures. Incorporation of DRR measures and cost depends on the vulnerability factors for e.g., land use planning can either reduce or increase disaster risk by allocating appropriate land for development, however there might be additional cost involved with the choice of land development and during the structural design stage it depends on the particular performance objective of the structure and the disaster resistant feature considered. In case of housing it would be important to design the structure to a minimum service level of operational or of higher order to life safety performance level. (ADPC, 2011)

Approaches in Mainstreaming DRR in Housing Sector

Figure 4 illustrate Approaches that could be adopted both in long as well as short term to mainstream DRR in the housing sector.

As shows this include entry points into the housing components which support housing development process and also the frameworks which shape these components as an enabling environment for mainstreaming DRR (ADPC, 2011)

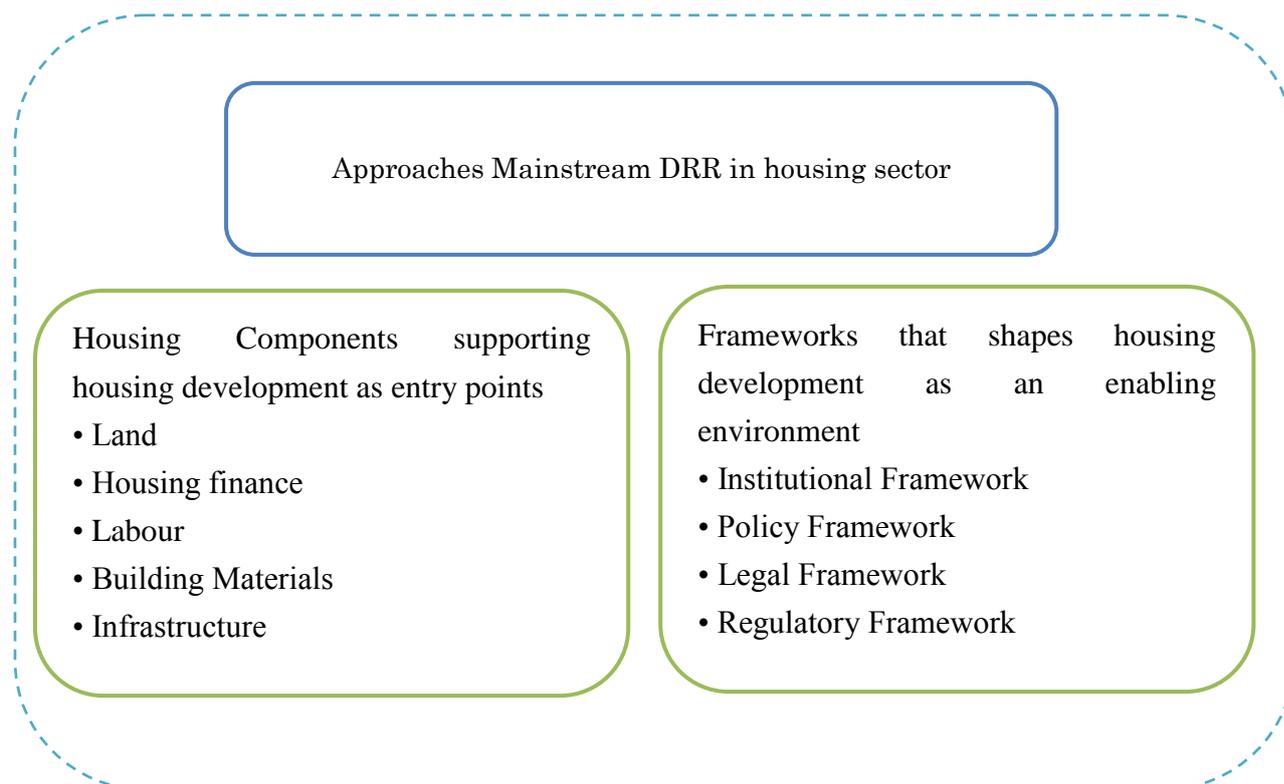


Figure4. Approaches of mainstreaming DDR in housing sector (ADPC, 2011)

Institutional Framework

Government through its National Housing and associated agencies plays an important role as a provider and enabler for development of housing in a country. National housing agencies are the core agencies where the mainstreaming of DRR can be initiated, sustained.

Further, housing as a multidimensional aspects necessitate close collaboration with various factors involved in sectors ranging from social, physical, economics, financial, environmental as well as livelihood aspects. It is important that all stakeholders are part of the process of mainstreaming including financial institutions, national and local agencies involved in DRR and housing, the municipalities, donors and the beneficiaries.

Policy Framework: National Housing Policy

The Habitat Agenda identified the right to adequate housing that is safe, secure, healthy, accessible and affordable as most crucial. In line with this, most countries have framed their National Housing Policy setting out the broad goals and objectives for housing and providing a framework for addressing housing issues through an enabling policy framework.

While in some cases housing development policy does not explicitly address disasters, policies often outline the need to provide safe housing, indicating safe from natural and man-made disasters. However more specific approach is required to address disaster risks. After disasters many countries have recognised the importance of mainstreaming DRR in the housing strategy.

Regulatory Framework: National Building codes and enforcement

The Building Codes are national instruments providing guidelines for regulating the building construction activities across the country. It serves as a model code for adoption by all agencies involved in building construction works including Public Works Departments, other government construction departments, local bodies or private construction agencies. In general, the Code mainly contains administrative regulations, development control rules and general building requirements; structural design and construction (including safety); fire safety requirements; stipulations regarding materials and other services.

DRR measures needs to be defined precisely and consistently in the existing building codes. The building codes are expected to have DRR integrated in respected to disaster resilient construction techniques; appropriate project planning for reducing risks and monitoring of process of mainstreaming DRR. These may require sufficient information and resources to include and modify the existing codes, the working organisational building code.

Legal Framework

Legal framework supporting housing development exist in form of National Urban Development and Housing Development Act, Town and Country Planning Act, Physical Planning Act, Land Act, National Housing Bank Act addressing rational use of land including for housing development, financial mechanisms, tenure system and mechanism for housing development, etc.

Entry points for mainstreaming DRR can be done either through the existing framework on housing such as amendments and / or through appropriate provisions in Disaster Management Acts. While above section focused on the frameworks which provides an enabling environment for mainstreaming DRR, following section focuses on specific DRR entry points in components related to housing development which are in turn shaped by the enabling environment.

Land

Land use planning is prepared to identify, adopt the best land use options for housing and also to identify alternatives. While good land use and planning can either eliminate disaster risk or minimize disaster risk by adapting appropriate mitigation measures it also reduces overall land vulnerability to disaster risks. Risk based land use planning can be an effective tool for managing disaster risks and protect development gains.

Finance

Housing finance is important factor which influence housing development. There are different models in which housing programmes are funded ex. Regular budget, Housing Banks, Housing Finance Companies, Commercial Banks, Non Banking financial institutions and donors. Most often housing finance is funded through financial institutions. Most cases these institutions have safety provisions during their appraisal process for ensuring the investments are safe by minimizing their susceptibility to natural hazards. However the appraisal process has not been adequate to make the investments safe and buildings resilient.

Labour

Labour in housing sector includes both formal and informal sectors. Non availability of skilled work force leads to poor design and construction of houses and infrastructure. Lessons from past disaster events, points to factors such as faulty design, weak construction material and poor maintenance, noncompliance to safety regulations. Formal sector holds prospects for improving the skills to ensure the quality and incorporation of disaster resistant design through relevant trainings and capacity building.

From a DRR perspective, technological advances are made to improve the disaster resistant features and subsequent enactments through building codes, however adaption of the improvements in practice are limited.

Building Materials

In general, choice of building materials for housing depends on various factors such as type, budget, culture, climatic condition and labour to name a few. Particularly in the context of low cost housing building materials need to be cost effective, environmentally friendly. However in practice, use of substandard materials, design and shoddy construction, poor maintenance are key reasons for structural failure. It is important to select appropriate building materials with designing process in order to reduce the structural vulnerability.

Infrastructure

Basic infrastructure and services such as electricity, water and sanitation, roads, waste disposal are key components of housing development and greatly contributes to living standards. In general, services provided by the local government authorities in developing countries are inadequate due to funding constrain and further the services are disrupted during any disaster events. At times, past infrastructure development itself creates or exacerbates vulnerability of the area. Hence it is important to design infrastructure systems to withstand disaster impacts and also ensure that infrastructure facilities support evacuation and emergency response functions (ADPC, 2011).

Basic Information

Iran is a county in southwest Asian, country of mountains and deserts. Eastern Iran is dominated by a high plateau, with large salt flats and vast sand deserts. The plateau is surrounded by even higher mountains, including the Zagros to the west and the Elburz to the north. Its neighbours are Turkmenistan, Azerbaijan and Armenia on the north, Afghanistan and Pakistan on the east, and Turkey and Iraq on the west.

Tehran is the capital, the country's largest city and the political, cultural, commercial and industrial center of the nation. Iran is a regional power, and holds an important position in international energy security and world economy as a result of its large reserves of petroleum and natural gas. (ICT Ministry, 2014)

Natural Hazards and Disaster Risk Management, Strategy and Implementation mechanisms in Iran

Iran has a high level of exposure to multiple disaster risks. Situated in one of the most arid regions of the world, it suffers from frequent, droughts. Moreover, floods, forest fires and sand

and dust storms increasingly affect different parts of the country. Iran's main concern however continues to be seismic risk. Due to its particular location in the Alpine-Himalayan mountain system, Iran is also highly vulnerable to numerous and often severe earthquakes. The Bam earthquake at 1:56 AM [UTC](#) (5:26 AM [local Time](#)) on Friday, December 26, 2003 (magnitude of 6.6 Mw) was one of several deadly tremors that have repeatedly struck Iran's towns and villages throughout its modern and ancient history. 13 years before other devastating earthquakes with a magnitude of 7.7 on the Richter scale hit the North of Iran at 00:30:09 on June 21, 1990 (21:00:09 June 20, 1990 [UTC](#)). The disaster estimated left 40,000 dead, more than 400,000 homeless, 60,000 or more injured. Around 100,000 homes and commercial buildings damaged and hundreds of towns and villages destroyed. Seismic Hazard Map of Iran is illustrated as below:

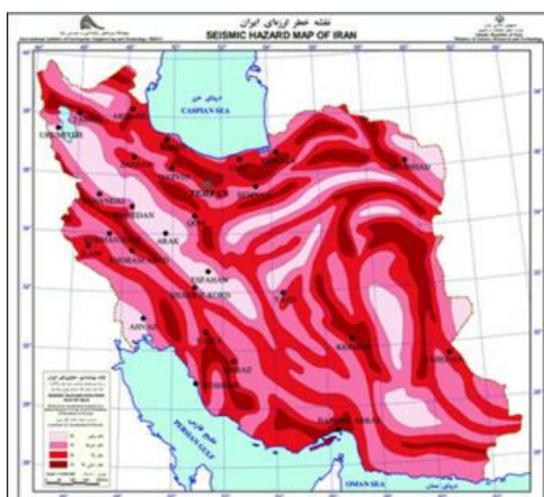


Figure 5 Seismic Hazard Map of Iran. Source: www.IIEES.ac.ir

Iran has developed an effective and internationally recognized disaster preparedness and response capacity at the national and local levels, but disaster prevention and risk reduction are areas that will require extensive longer-term efforts as well as multi-sectoral and multi-stakeholder planning in development sectors such as health, education and urban planning. At the same time, comprehensive concepts and standards of risk reduction – which include social dimensions as well as physical aspects of disaster prevention – can be further improved. (NDMO, 2012 and UNISDR, 2014)

Iran has significant experience and capacity in relief and emergency response as well as in some technical areas of disaster risk management, such as hazard mapping, earthquake engineering and reconstruction planning. In terms of disaster preparedness and response, Iran

has strong technical institutions and institutional arrangements for disaster management at the national level.

In the last two decades, the Government of the Islamic Republic of Iran took a number of steps to enhance its national disaster management capacity. This has resulted in strong disaster preparedness and emergency response capabilities at national and local levels.

The 5th National Development Plan of the Islamic Republic of Iran (2011-2015) addresses the issue of disaster risk reduction and management in several areas, including enhancement of disaster preparedness and response, upgrading building and construction codes and standards and earthquake prevention measures, improving safety in rural settlements, and importantly, allocation of 2% of annual national budget to disaster risk reduction and management. (NDMO, 2012)

In 2008 the National Disaster Management Organization (NDMO) is established in order to utilize the national, regional and local capacities to confront the natural and unexpected disasters as well as creating an integrated management system for policy making, planning, coordinating research and executive activities in a cohesive manner, concentrated information dissemination and supervision over different phases of disaster management as well as rehabilitation and reconstruction of disaster stricken areas. (NDMO, 2012)

In order to coordinate the activities of the organizations and institutions affiliated to the three State governing branches, the Armed Forces and the other institutes and agencies under the auspices of the Supreme Leader (with regard to delegation of authority by His Honor) as well as for enacting of regulations and standards governing the four phases of disaster management, the High Council of the National Disaster Management Organization (hereinafter referred to as the High Council) is formed. The High Council is chaired by the President and its membership will include relevant Ministers, Mayor of Tehran, Commander of Armed Forces, one of the deputies of the Speaker of the Islamic Consultative Assembly, First deputy of the Judiciary, Heads of Management and Planning Organization, the Islamic Republic of Iran Broadcasting Corporation, Head of Red Crescent Society of the Islamic Republic of Iran, care taker of the Imam Khomeini Relief Committee, Head of State Meteorological Organization, Head of Housing Foundation of the Islamic Revolution, as well as the Head of the Organization.

Disaster Management Coordination Council has been formed under the chairmanship of the National Disaster Management Organization Head and membership of the plenipotentiary representatives deputizing the related organizations and organs in order to coordinate activities.

Disaster Management Coordination Council in the provinces is formed under the chairmanship of Governor Generals and Governors in the provinces and cities respectively. Its membership includes the entire related organizations.

The NDMO is affiliated to the Ministry of Interior and the Head will be appointed on the proposal made by the Minister of Interior, endorsed by the High Council and the decree given by the Minister of Interior

The functions of the organization are as follows:

1. Development of policies and plans of action related to the four phases of disaster management, and planning for provision or making possible use of the potential & capacities pertaining to the governmental, non- Governmental organizations and the Armed forces during the preparedness and response operations, in order to be presented to the Cabinet of Ministers for approval.
2. Facilitate coordination and create cohesion among the various organizations in the country regarding the four phases of disaster management.
3. Arrange for review and develop policies and comprehensive plans on culture, research, training, and propagation, dissemination of information, as well as rehearsal and testing activities in the four phases of disaster management in order to be proposed to the High Council.
4. Strengthen regional and international cooperation, exchange of views and make use of experiences and the know- how of countries and international organizations in relation with the four phases of disaster management, as well as representation of the country in the international communities with coordination and collaboration of related organizations.
5. Documentation of disasters, the measures taken and the analysis made in this regard.
6. Planning and coordinating the organization and training of the entire people- centered organizations including non-governmental institutions, Basij forces and volunteers in the four phases of the disaster management.

7. Follow up to the ratifications and decisions of the High Council
8. Coordination and supervision over development and expansion of effective prevention systems, retrofitting and seismic improvement of constructions, infrastructures, buildings and crucial and important lifelines as well as reconstruction and improvement of the old textures, development of reinsurance and compensatory methods including different insurances, financial support and encouraging mechanisms in cooperation with the related organizations.
9. Supporting the development and expansion of active scientific and consultative institutes and benefiting from their collaboration for the purpose of standardization and safety control of products, services, building and infrastructural facilities, as well as supervision of approved standards that should be taken into account.
10. Develop the system of national work division for enhancing the culture of safety for each member of the community with cooperation of the Ministries, organizations, institutions and the organs related to disaster management in order to be presented to the Cabinet of Ministers for approval.
11. Develop directives on determining the level of disasters as being of national, regional or local significance, including emergency situations and the methods by which the crises resulting from unexpected disasters are announced.
12. Provide directives to related organizations on procedures of the emergency and contingency plans that can be executed in the event of or likely occurrence of a disaster.
13. Coordinate deployment of the entire potentials and capacities of both governmental or non – governmental organizations and the Armed forces which are required by the disaster management during the disaster response phase.
14. Develop appropriate rules and regulations concerning the investigation of violations and breach of approvals and orders of the High Council and the organization as well as negligence in performance of duties by officials in the entire related organizations, public non- governmental organizations, the Armed forces and the organizations under the auspices of the Supreme Leader during the disaster response phase with cooperation of the Judiciary and the Armed forces general staff to be submitted to the Cabinet of Ministers for approval and the consequent implementation and follow – up.
15. Develop draft on rules and regulations concerning the pre-emptive measures to address abusers, rioters and plunderers during the disaster with cooperation of the Judiciary and the Armed forces General staff to be submitted to the cabinet of ministers for approval, the consequent follow up and monitoring the implementation.

16. Develop operating procedures and guidelines with cooperation of related organizations on receiving and distribution of national, international and foreign aids to be submitted to the Cabinet of Ministers for approval and the subsequent follow – up.
17. Develop a comprehensive information management system assisted by information networks of the scientific and research centers and the responsible executive organizations as well as establishing the Disaster Information Management Center in the organization in order to provide timely warning before occurrence of the likely disaster together with sound dissemination of information to the authorities and the public at the time of disaster.
18. Overseeing at the highest level and evaluating the activities of the related organizations on the four phases of disaster management (particularly preparedness and response) in order to be reported to the High Council.

The Iranian Emergency Response System

Disasters are categorized as being of National, Regional or local significance. Depending on the classification of disasters, the respective authorities take control to direct relief efforts. During the disaster, the entire relevant organizations are obliged to participate in the response operations upon the call of the Head of the High Council in accordance with pre-planned programs. A report will be presented to the organization accordingly. The cessation and termination of the response operations will be announced by the Head of the High Council.

Specialized Working groups

14 Specialized Working groups under the overall supervision of the Ministry of Interior and headed by their ministries are responsible for managing, coordinating, administrating all activities related to Natural Hazards in their Organizations. The Specialized Working groups are as follows:

1. Communications
2. Health and medical care
3. Droughts, Vegetation diseases and cold
4. Transportation, lifelines and weather disasters
5. NGO's
6. Recovery , Hazardous material, Insurance, Firefighting

7. Security
8. Flood, power, sanitations and sea level rise
9. Fuel and oil supply
10. Earthquake and landslide
11. Reconstruction
12. Environment hazards
13. Media and public Awareness
14. Rescue and relief and public Training

These working groups are at three levels: Local, national and provincial.

Regional (Provincial) and Local (District) Structures

The national structure of the Ministry of Interior is mirrored at provincial level. The provincial and township sub- units formed under the supervision of Governor Generals and Governors respectively.

The deputy Governor General for development affairs and the deputy Governor will respectively substitute the Governor Generals and Governors in the Disaster Management Coordination Council in provinces and cities, who will be obliged to play their role as coordinator and reporting to the organization.

Mainstreaming DRR in development planning In Iran.

As a signatory of the HFA 2005–2015, Iran, along with another 167 nations and multilateral institutions, is formally committed to mainstreaming DRR into national/sectoral development. This ten-year framework resolves to reduce disaster losses and is centered on the more effective integration of disaster risk considerations into sustainable development policies, planning and programming at all levels, with a special emphasis on disaster prevention, mitigation, preparedness and vulnerability reduction. The 2007 Delhi Declaration on DRR in Asia, at the Second Asian Ministerial Conference on Disaster Risk Reduction, reiterated the importance of mainstreaming as the second of six key areas of action. Mainstreaming initiatives advocated by the declaration included the mainstreaming of DRR into national sustainable development strategies, plans and programs in key sectors and efforts to ensure that development does not create further disasters; further strengthening of the legislative frameworks and institutional mechanisms for DRR; the positioning of communities at the

center of all aspects of DRM; the conduct of risk assessment as an ongoing process; and the strengthening of financial mechanisms for disaster reduction.

In fulfilling Iran's commitment to integrating DRR into development policies and programmes, the government is about to begin to translate its international and national commitments into practical steps and to enhance multi-sectoral buy-in to integration. There are however challenges in the implementation of the HFA. One challenge is to overcome the lack of recognition of DRR as a development concern. Another challenge which is inter-linked to the first challenge is inadequacy of resources for integrating DRR. The need for intensified capacity building in ensuring policy implementation, for planning skills, and for focused leadership are equally important challenges faced by NDMO and Strategic Planning and Supervision (SPAS) as the apex institutions towards integrating DRR in national and sectoral development.

Based on the above, there are several broad gaps as follows:

- Awareness-building is required to secure a solid appreciation and understanding of the link between DRR and sustainable development and of the fundamental importance of DRR to core development goals. Such awareness is most critically essential on the part of (SPAS), NDMO, key line ministries / agencies as well as local authorities and communities in high-risk areas. However, in view of the holistic, cross-cutting nature of disaster risk and potential consequences of decisions in one sector for disaster risk in another, policy- and decision-makers across all areas and levels of government as well as the private sector and civil society also need to be aware of the importance of considering disaster risk as a routine part of their work;
- Enhanced capacities are required to mainstream DRR concerns into sectoral programmes as well as use mainstreaming tools in the daily work of individual Ministries;
- Increased understanding and operational skills should be developed among participants on establishing inter-ministerial partnerships for integrating DRR into development work, including private sector;
- Capacity is needed to undertake advocacy, promote awareness, and conduct training for mainstreaming DRR into development.

At the national level, since the national development agenda sets the framework for development in each sector, it is important to utilise the opportunities that are provided by Iran's platform of 5 year national development plans for integrating DRR. On the other hand, most often local governments are not fully aware of their city-specific DRM "options", nor do they comprehend the "process" for successfully implementing these options. Thus, across the spectrum of local government duties, DRM is not very well recognised, is difficult to implement, and is sometimes a challenging proposition for local governments. A primary challenge is therefore to help mainstream DRR as a development concern for local governments.

Thus far, there has been little investigation and analysis of the key challenges around DRR integration or of mechanisms, opportunities and incentives for mainstreaming. There are inadequate reliable data on the type and amount of Iran's economic activity at risk from natural hazards. In addition, a fundamental obstacle is the absence of accurate hazard and vulnerability maps. In this regard, Iran urgently needs an integrated natural hazards and vulnerability data and mapping system to be designed and implemented. In Hazard mapping and physical exposure, efforts need to be initiated to cover the whole country and to produce an integrated national multi-hazards data and mapping system, recognizing geological, watershed and other ecosystem boundaries, rather than political and administrative districts. They also need to be further extended to map risk, a considerable challenge, due to the existing functional and budgetary compartmentalization between different government departments involved in DRR and DRM. Overlaying discrete single-hazard datasets from different participating agencies would require a separate round of field assessments for vulnerability and adaptation analysis. The determination of impact requires a multi-disciplinary approach toward data integration and mapping vulnerabilities.

With a population of 75 million, Iran has a number of mega cities that are vulnerable to seismic risk. Thus far, efforts had focused on the assessment of the risk carried out by the technical community. Most of the efforts and resources have been used in studies to produce reports, maps, papers and conferences that have not been utilized by the whole community. Very few concrete actions have resulted from those studies, and there has been almost no progress in the incorporation of the community in the "risk-reduction" process. (NDMO, 2012)

Disaster Management in Japan

Geographically, Japan is located in the East Asia and Pacific Ocean because of geographical, topographical and meteorological conditions, the country is prone to frequent natural hazards such as earthquake, Tsunami, typhoons.

For managing Disasters, Japan has three administrative levels of governance; national, prefectural and municipal. Each level of governments has its own disaster management organizations, policy frameworks and budgets. When disasters occur, municipalities respond first. In case disasters are large in scale beyond their capacity, national and prefectural governments provide every possible support. (See figure6).

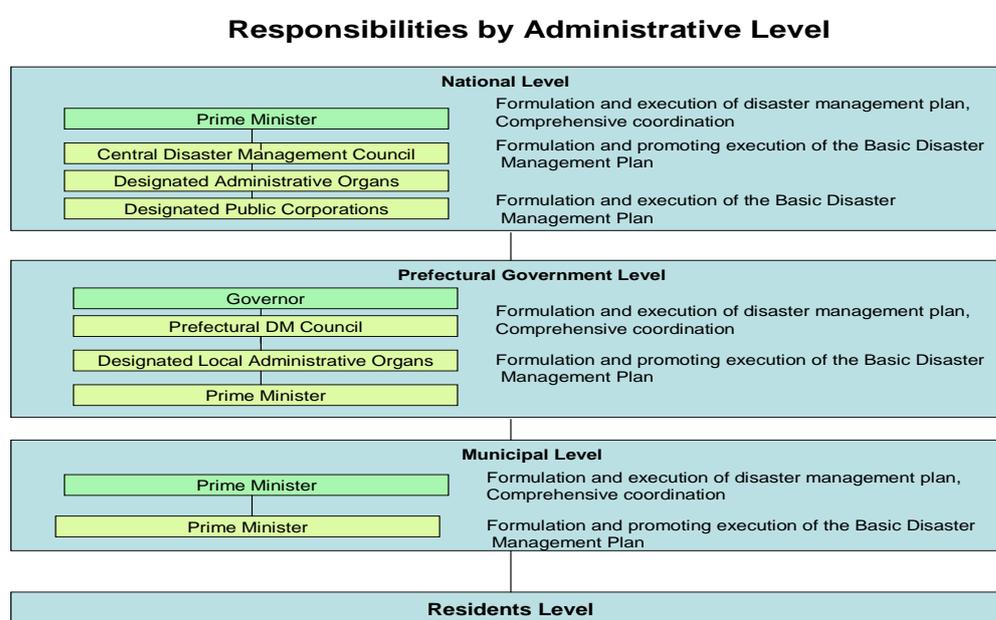


Figure 6, administrative systems in Japan, Source: Cabinet Office, Feb 2011)

Disaster Management Strategy, Policy, and Plan

Basic Disaster Prevention Plan is the master plan and a basis for disaster reduction activities in Japan. Basic Disaster Prevention Plan is prepared by the Central Disaster Management Council in accordance with Article 34 of the Disaster Countermeasures Basic Act. The plan clarifies the duties assigned to the Government, public corporations and the local government in implementing measures. For easy reference to countermeasures, the plan also describes the sequence of disaster countermeasures such as preparation, emergency response, recovery and reconstruction according to the type of disaster.

Structure of Disaster Management

Organization of National Government and Cabinet Office (Disaster Management)

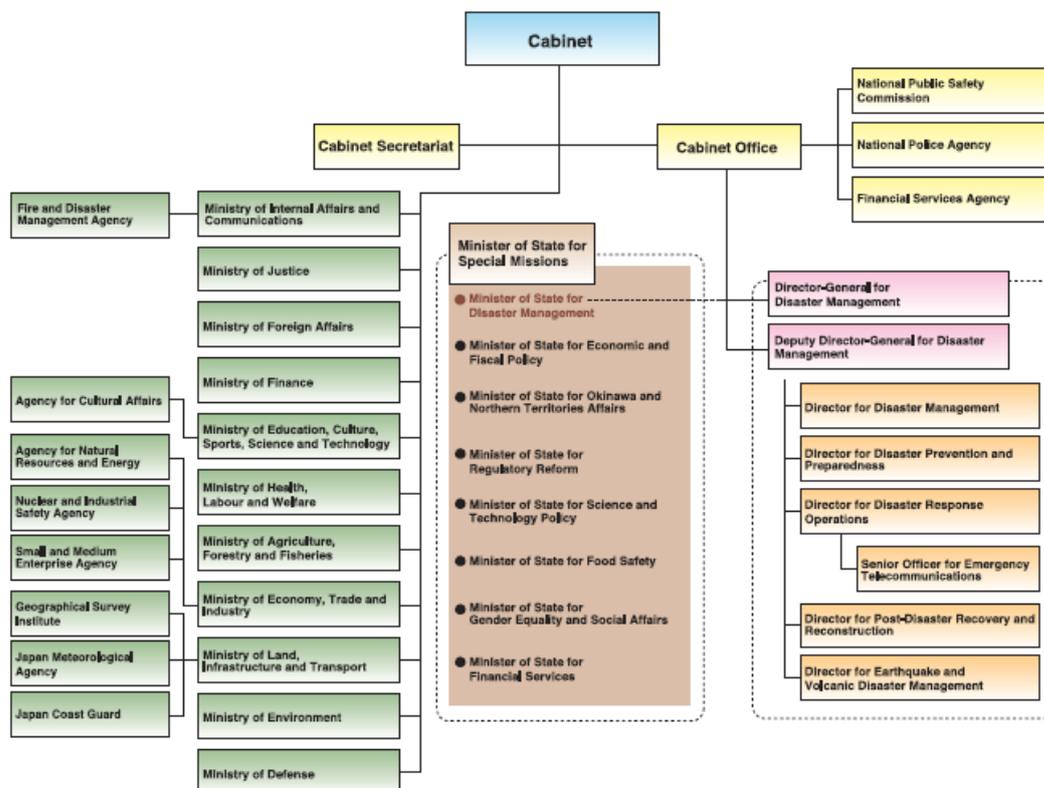


Figure 7. Central Disaster Management Council

Mainstreaming Disaster Risk Reduction into Housing sector in Japan

To study the mainstreaming DRR into housing sector in Japan, the following approaches were reviewed and examined for two huge earthquakes, one Great Hanshin-Awaji in 1995 and second Japan Great East Earthquake in 2011:

1. Institutional framework
2. Policy and legal framework
3. Regulatory framework
4. Land and housing finance
5. Labour,
6. Building materials and
7. Infrastructure

Type of construction in Japan

Traditionally, Japanese buildings were wooden based structures and even now, most of the low storied buildings are still built using the wood. But most of the apartments, including

condominiums, are reinforced concrete structures or steel structures (Tomohiro, Hasegawa, 2013).

Institutional Frame work

The Central Government legislates for building regulations based on the Building Standard Law (BSL) in Japan. The building regulatory systems and building codes (technical requirements) has 2 levels as follows:

1. Legislation by National governments
2. Legislation by local governments.

There are two levels of local governments in Japan: prefectures, and basic local governments such as cities, towns and villages. At the national level, the Ministry of Land, Infrastructure, Transport and Tourism (MILT) is responsible for managing and administering issues related to BSL. At the local level, the MILT bureaus and municipalities do the same tasks.

Policy and Legal Framework

In line with Housing sector, the following Acts/Laws are available:

1. Disaster Relief Act(1947)
2. Flood Control Act(1949)
3. Building Standard Law (1950)
4. Act on Temporary Measures for Disaster Prevention and Development of Special Land Areas (1952)
5. Meteorological Services Act (1952)
6. Act on Temporary Treatment of Rental Land and Housing in Cities (1946)
7. Act on National Treasury Share of Expenses for Recovery of Public School Facilities Damaged Due to Disasters (1953)
8. Airport Act (1956)
9. Small-scale Business Equipment Installation Financial Support Act (1956)
10. Seashore Act (1956)
11. Landslide Prevention Act (1958)
12. Act on Special Measures for Disaster Prevention in Typhoon-prone Areas (1958)
13. Disaster Countermeasures Basic Act(1961)
14. Act on Special Financial Support to Deal with Extremely Severe Disasters (1962)
15. Act on Special Measures for Heavy Snowfall Areas (1962)

16. River Act (1964)
17. Act on Earthquake Insurance (1966)
18. Act on Prevention of Steep Slope Collapse Disaster (1969)
19. Act on Special Financial Measures for Group Relocation Promotion Projects for Disaster Mitigation (1972)
20. Act on Payment of Solatia for Disasters (1973)
21. Act on Special Measures for Large-scale Earthquakes (1978)
22. Act on Special Measures for Reconstruction of Disaster-stricken Urban Areas (1995)
23. Act on Special Measures for Reconstruction of Jointly Owned Buildings in Disaster-stricken Areas (1995)
24. Act on Special Measures for Earthquake Disaster Countermeasures (1995)
25. Act on Promotion of the Earthquake-proof Retrofit of Buildings (1995)
26. Act on Special Measures for Preservation of Rights and Profits of the Victims of Specified Disasters (1996)
27. Act on Promotion of Disaster Resilience Improvement in Densely Inhabited Areas (1997)
28. Act on Special Financial Measures for Urgent Earthquake Countermeasure Improvement Projects
29. Areas for Intensified Measures (1980)
30. Amendment of Building Standard Law(1981)
31. Act on Support for Livelihood Recovery of Disaster Victims (1998)
32. Act on Promotion of Sediment Disaster Countermeasures for Sediment Disaster Prone Areas (2000)
33. Specified Urban River Inundation Countermeasures Act (2003)
34. The Japan Finance Corporation Act (2007)

Legal Framework

Following are the list of policies and strategies to improve building safety:

1. Act for Promotion of Retrofitting
2. Housing Quality Assurance Act
3. Amendment of BSL
4. Financial assistance to those who retrofit their buildings/houses
5. Development of technologies to promote retrofitting

Regulatory Framework

The BSL is the primary law concerning building codes and was first enacted in 1950. Through the experiences and lessons learned from different disasters, the Building Standard Law was revised in 1981. Figure 8 illustrates the regulatory framework in Japan. Other laws concerning building constructions and regulatory procedures are shown in the figures 9 and 10.

Building codes items and related fields		Restrictive laws (Requirements are mandatory.)	Promotional laws
Fire safety	Fire extinguishing equipment, etc.	Fire Service Law	
	Fire- resistance, evacuation, etc.	Building Standard Law	
Structural safety			Seismic Retrofitting Law
Hygienic safety			Building Management Law
Accessibility		Barrier-free Law	
Energy saving			Energy Saving Law

Figure 8, Regulatory Framework in Japan, Source: Tomohiro, HASEGAWA, 2013

Land use

From the viewpoint of urban environment and also for the purpose of preventing the proximity of buildings that differ widely in their use:

1. There are 12 types of land-use zones are designated by the local governments in their respective administrative areas, based on the City Planning Law; and
2. The use of buildings is restricted by the BSL according to land use zones.
3. Twelve types of land-use zones and their purposes of are shown in the next page. For example, in a zone that is defined as a Residential Zone, the construction of factories and other facilities that would lead to the deterioration of the living environment is restricted, while the construction of schools and hospitals is restricted in areas that are designated as Industrial Zones.

Finance

Housing finance in Japan is predominantly generated from the deposit-taking system, whether by commercial banks or public-sector lending institutions. The largest single mortgage lender makes loans at a lower rate of interest about 5.4 percent (Seko, 1994). whereas the national budget for disaster management is approximately 1.2 trillion yen (Initial budget 2010FY).

Labour

In Japan buildings builds by private companies who received licence. The majority of constructing company benefits skilled work force. During process of construction regular inspections makes by authorities in terms of design, administration and infrastructure. Construction Building must meet Building Standard Law. After occupancy Periodic inspection report conducted by experts and checked by the local government.

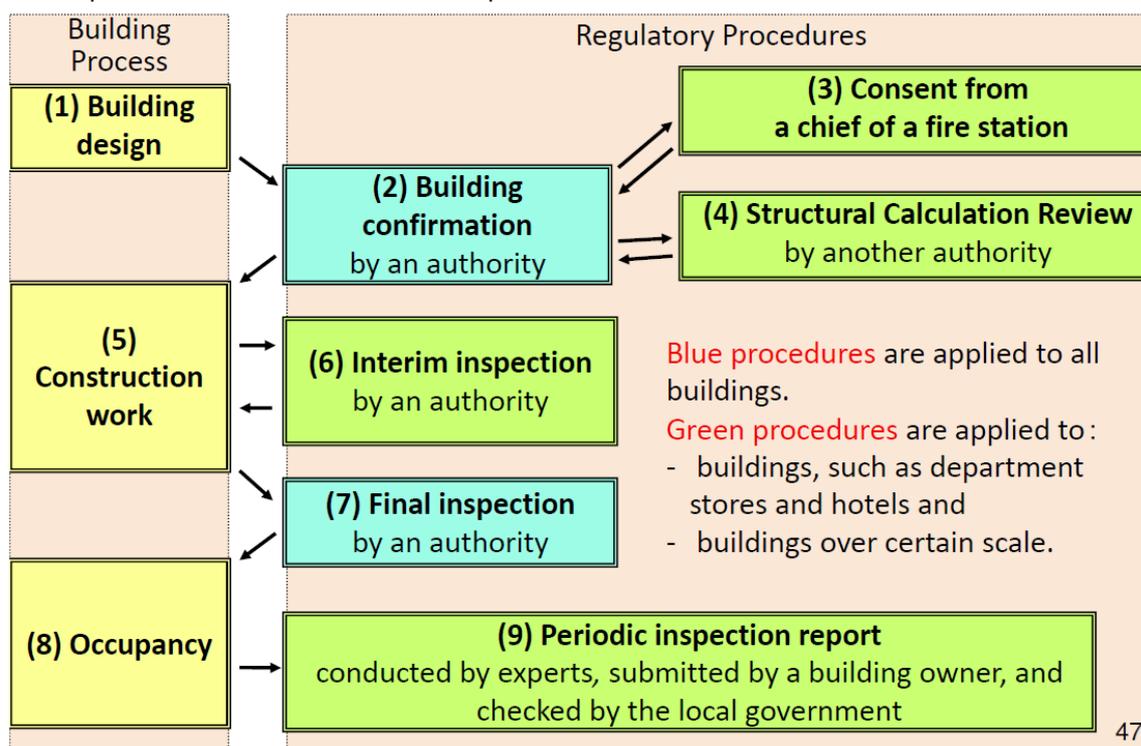


Figure 9, Regulatory procedures in Japan, Source: Tomohiro, 2013

Building materials

Common building structures in Japan are: wooden (one or 2 stories), Two-by-four construction is an alternative to the native style, Large buildings are typically constructed of reinforced concrete Structural steel products are Japanese Industrial Standards(JIS) standard products.

Japan Architectural Standard Specification and Commentaries(JASS) also presents standard quality levels for buildings of normal size and form constructed in Japan, basically describes widely used construction methods and technologies, and further clarifies noteworthy items.

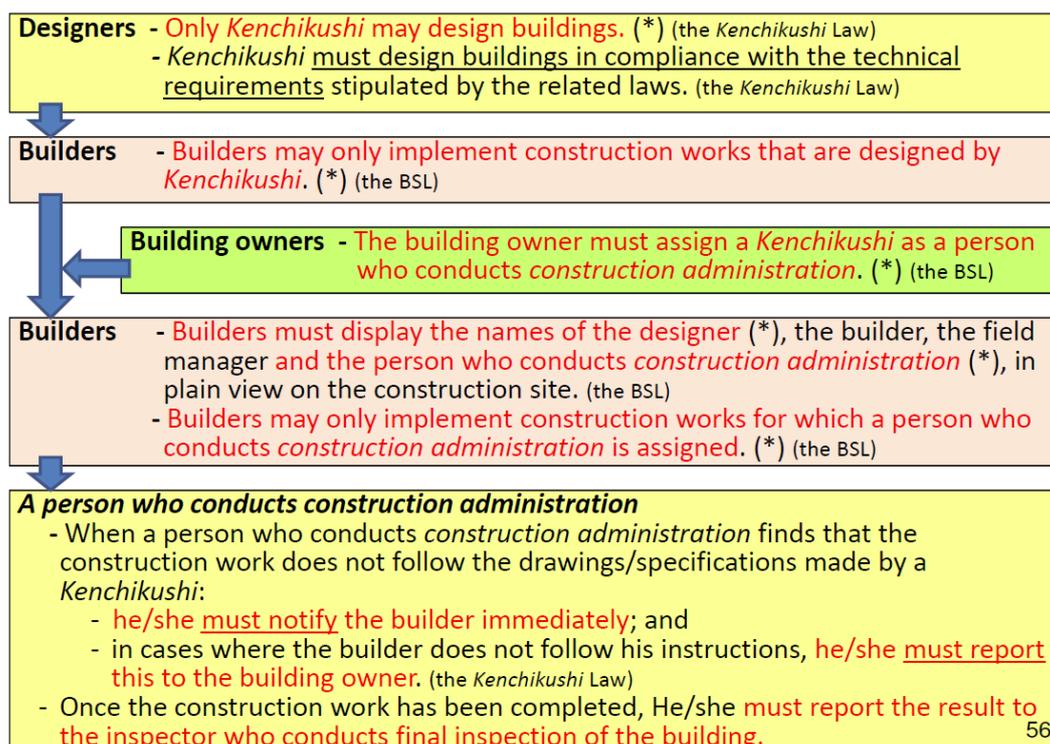


Figure 10, Provisions related to construction administration. Source: Tomohiro, 2013

In construction Building materials must meet technical requirements if the codes have specific mandatory standards that apply. It can be basically confirmed through either method below that they meet technical requirements.

- I. To satisfy one of the specifications provided by the prescriptive provisions, including ministerial Notifications, JIS or JAS (Japan Agricultural Standards)
- II. To be approved by the Minister (It is needed to be evaluated by one of the Designated Evaluation Bodies prior to approval by the Minister.)
- III. Innovative products, which do not satisfy one of the specifications provided by the prescriptive provisions, can be used if they are approved by the Minister through the process of (ii) above

Case studies

Great Hanshin-Awaji Earthquake

The earthquake occurred at 5:46 am, January 17, 1995, the magnitude was 7.2 on the Richter scale, 6 and 7 on the Japanese scale in different areas .Due to earthquake number of 82,000 houses was destroyed.

Temporary and Permanent Reconstruction

After earth quake government had done two stages: Temporary Housing and Permanent housing. In the emergency phase number of 32,346 units as a temporary housing was constructed. For Housing Reconstruction the Government planed 5 years program. Emergency Three-Year Plan for Housing Reconstruction (1995-1997) ,(2) Restoration Plan (1996-1997) that The elderly and low-income earners accounted for a large proportion of the disaster victims and finally Three-Year Housing Plan (1998-2000) that based on the following measures had done:

1. Smooth transition from temporary housing to permanent housing
2. Provision of public housing and support for daily living for the disaster victims
3. Housing and urban development towards the coming 21st century
4. Cooperation with the welfare division, housing and urban development based on the regional characteristics and utilization of the resources of Kobe specially designated

Public Reconstruction Fund:

To provide funds for various activities for rapid recovery from the Great Hanshin-Awaji Earthquake, to provide financial assistance to earthquake victims and help them rebuild their lives, to facilitate the implementation of a long term stable overall recovery plan for the region struck by the earthquake, and to recapture the damaged areas.

- Basic Assets (Donations): 100 million yen
- Management Assets (Work Funds): 2.29 billion yen

The cost for the restoration and reconstruction after the Great Hanshin–Awaji Earthquake was JPY16.3 trillion (Okada, 2011,).

Urban Planning

Procedures for Community Development in view of Seismic Disaster Restoration
Employment of “2-Stage City Planning” Method:

1. 1st Stage of city planning

Government defines regions and urban facilities to be improved

2. 2nd Stage of city planning

- a. Residents have talks and determine roads and parks necessary for improvement of the region by themselves.
- b. Government draws up city planning and restoration project plan according to proposal submitted by residents:
 - For Moving to Second Stage Community Development with Residents anticipation Desire of victimized residents
 - Restoring community that ensures safe and comfortable living
 - Improving urban infrastructure (roads and parks)
 - Constructing durable houses
 - Drawing up plan with residents
 - Equal burdens on residents and landowners

Infrastructure:

All lifelines were restored within three months. The reason that such fast restoration was possible was because of the input of a large number of aid organizations and teams. As a result, the system in the initial stage of emergency response has been reviewed and mutual assistance agreements have been concluded. (The Office of the 10th Year Restoration Committee, 2005)

Great East Japan Earthquake

The earthquake was happened off the coast of Sanriku at 14:46 on March 11, 2011. That was the largest ever earthquake on record in Japan (Magnitude 9.0/ Maximum seismic intensity of 7). Around 126,631 Building Completely destroyed. 10 years planned for the reconstruction period, with the first 5 years being the intensive reconstruction period for swift recovery.

Support for reconstruction:

- Establish a system of “Special Zones for Reconstruction”
- Establish easy-to-use grants for the conduct of reconstruction projects planned by local governments
- Collaboration with the private sector for reconstruction (Agency Reconstruction, 2013)

Outline of the Special Zones for Reconstruction

A package of special measures relevant to regulations/procedures, taxation, financial and fiscal assistance as well as land use restructuring has been done.

Land Use Restructuring

- Special arrangements for land use restructuring beyond existing land use frameworks (urban area, farming area, forests, etc.)
- Relaxed requirements for floor area ratio for buildings construction aimed at evacuation from tsunami(Agency Reconstruction, 2013)

Budget

Budget for reconstruction is conducted intensively from 19 trillion yen to 25 trillion yen (Takumi, 2014)

Finding and Suggestions

To mainstream DRR into Housing sector, all housing related interventions have to be considered for the effect of natural hazards taking the followings into account:

1. Institutional Framework,
2. Policy Framework,
3. Legal Framework,
4. Regulatory Framework,
5. Land use,
6. Housing finance,
7. Labour,
8. Building Materials and
9. Infrastructure

Based on the lessons learned from Japan in mainstreaming DRR into housing sector, and according to the situation of Iran, the following recommendations are proposed:

- ❖ Creating awareness
- ❖ Gaining political commitments and support
- ❖ Promoting public awareness on DRR through media coverage
- ❖ Developing necessary laws, policies and strategies in different aspects of housing
- ❖ Developing policies, regulations, guidelines related to housing sector concerning finance, land, labour, building materials and infrastructure
- ❖ Reassessing policies, regulations and role of agencies associated to housing sector in terms of DRR
- ❖ Promoting the observance of the National Building Code.
- ❖ Carrying out estimation of annual disaster losses (direct and indirect) related to investments and project activities.
- ❖ Systematic inspection from design to occupancy.
- ❖ Allocating additional financial mechanism to mainstream DRR in housing sector.
- ❖ Designing the infrastructure facilities with resilience features.
- ❖ Regular review of building codes to incorporate DRR and other features.
- ❖ Developing regulations related to quality of building materials.
- ❖ Promoting the use of local, environmental friendly and durable building materials.
- ❖ Allocating subsidies for earthquake resistant retrofitting.
- ❖ Designing courses and short term training programs for Engineers, Architects,

construction labours to upgrade their skill on DDR.

- ❖ Administering of public housing sector by qualified companies.
- ❖ Developing financial products for encouraging risk transfer through insurance
- ❖ Facilitate training for skill up-gradation of construction workers
- ❖ Administration of special programme for Capacity Building of Engineers in Earthquake Risk Management
- ❖ Risk based land use planning for an effective tool for managing disaster risk and protecting developmental gains.
- ❖ Making Temporary housing just similar to permanent housing declines speed of recovery and reconstruction.
- ❖ Involving local people in the land use planning for reconstruction after disasters.
- ❖ Using the opportunity made by disasters to make a safer city: eg. modification of streets, alleys, etc.
- ❖ Developing reconstruction plan based on geographic situation of affected sites.
- ❖ Regular review and examination of reconstruction after disasters.
- ❖ Considering the lessons learned from the past reconstructions.
- ❖ In reconstruction after disasters, haste is not always beneficial in drafting reconstruction plans.

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