# Development of Strategic Disaster Reduction Planning Scheme with Stakeholder Involvement; Tools for Performance Measure Setting

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**ABSTRACT :**

Central government of Japan set strategic goals for disaster reduction against high risk earthquake disasters such as Tokai-Tonankai-Nankai Earthquake and Tokyo Metropolitan Area Earthquake. Strategic goals set by central government are about death toll and economic loss. Now local governments are working to set their strategic disaster reduction plan corresponding strategic goals set by central government. Strategic disaster reduction plans should have performance measures to correspond to set strategic goals. Disaster reduction is consisted of mitigation, preparedness, response and recovery. Though performance measures for mitigation counter measures have been developed, performance measures setting for preparedness, response and recovery have not. This paper shares tools for performance measure setting based on participatory strategic disaster reduction planning. Case study was conducted in Nara Prefecture government in Japan.

**KEYWORDS:** Disaster Reduction Plan, Stakeholder Involvement, Local Governments, and Performance Measures

## 1. INTRODUCTION

Western part of Japan could suffer from devastating damage by the earthquake occurring at off shore of pacific ocean, called Tokai-Tonankai-Nankai Earthquake, with 50-60 % possibility within 30 years and Tokyo metropolitan area also could suffer from devastating damage from the earthquake of about JMA magnitude 7 with 70% possibility within 30 year. Strategic approach is essential to reduce the damage from those earthquakes and central government of Japan set strategic goals that are reducing human death toll to 50 % for both risks and economic loss of 50 % for Tokai-Tonankai-Nankai Earthquake and 60% for Tokyo Metropolitan Area Earthquake. Now local governments are working to establish their strategic disaster reduction plan corresponding to strategic goals set by central government. Strategic plan have breakdown plan for accomplishing set strategic goals and should have numerical performance measures corresponding strategic goals within breakdown structure. Setting target or performance measures for "mitigation countermeasures" such as reduction of human death is not difficult task because the causal relation model on how people were killed by earthquake disaster are clear. We can easily understand core for the countermeasure is seismic safety of built environment, and as the performance measure to accomplish strategic goal for human death reduction can be a rate of seismic safety buildings. However, setting performance measure for preparedness, response, and recovery such as better disaster response, shelter management, and long-term recovery is difficult task. Disaster reduction is consisting of mitigation, preparedness, response, and recovery, so that we should also set performance measure those.
This paper shares tools for performance measure setting based on participatory strategic disaster reduction planning. Case study was conducted in Nara Prefecture government in Japan (Maki et.al. 2006a). Developed planning scheme are extension of the participatory strategic disaster planning scheme developed from the case study in Marikina City, Philippines (Maki et.al. 2004).

## 2. TWO FEATURES IN EFFECTIVE PLAN

There are two features in effective plan; one is how the ideas of stakeholders are compiled into a plan, and the other is how the plan is feasible. Participatory strategic planning scheme covers both features.

### *2.1 Compiling Ideas of Stakeholders into Plan*

A participatory planning process works for the first feature, how the ideas of stakeholders are compiled into a plan. Ideas of stakeholders compiled into the plan through the three step process such as idea generation, structuring ides, and consensus building by small group discussions (Figure 1). And participation of various stakeholders could work for making the plan comprehensive and also create the sense of ownership to the plan. To reflect their imagined visions and ideas into the plan, those visions and ideas need to be transformed as a statement and shared among stakeholders. So first step of participatory planning is "Idea Generation". Thorough this process imagined visions and ideas of stakeholders are transformed into a statement and shared among stakeholders. In case of Nara disaster reduction planning, "Idea Generation" process was managed through the following processes, 1) submitting ideas and visions to the planning body, 2) participating to the planning workshops, and 3) lessons from previous disasters. Table 1 shows resources and numbers of ideas for the plan. The plan was prepared based on 2015 ideas from various stakeholders. Visions and idea collected through "Idea Generation" process need to be structured as a form of plan. Second step for participatory planning is "Structuralizing Ideas". In case of Nara planning, generated ideas were organized based on strategic planning structure. Final step for participatory strategic planning is "Building Consensus" on ideas structuring. By going through those steps various times, the Nara Prefecture Earthquake Disaster Reduction Plan was established.

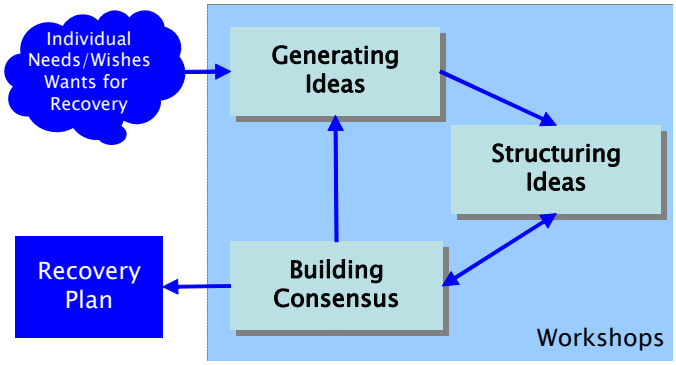


Figure 1 Workshops as a tool for participatory planning

Table 1 Resources of Idea

| Resources | Number of ideas |
|---|---|
| Planning Workshop | 823 |
| From government staffs | 237 |
| lessons from the other plans etc. | 950 |
| Total | 2015 |

### *2.2 Feasibility of Plan*

A strategic plan scheme is used to accomplish the second feature, how the plan is feasible. In the strategic planning process, all the contents of the plan are decided using an objective-oriented approach. It means all the contents will be decided as tools to accomplish one higher level of contents, for example, policies being countermeasures to accomplish an objective. (Figure 2) Another point of strategic planning is to set numerical performance measures corresponding objectives level of the plan. Method to set performance measures based on causal relation analysis of contents will be discussed later. Evaluation or management of implementation of the plan is important, and based on set performance measures; “outcome” of the plan will be monitored.

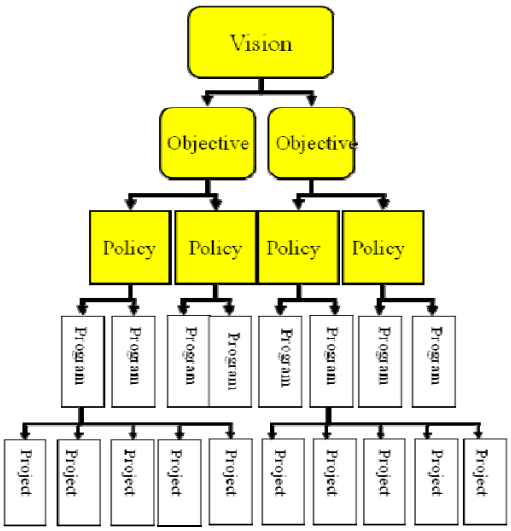


Figure 2 Structure of Strategic Planning

## 3. PLANNING PROCESS

### *1.1. Planning through Workshops*

Planning process is consisted of three phases such as preparation, planning and implementation (figure 3). At preparation phase, stakeholders will make decision on having a strategic disaster reduction after sharing risks in a community and importance of having comprehensive strategic plan. In planning phase, strategic plan is established. Objectives (Figure 4) for plans are set through two workshops, and causal relation diagrams corresponding to each objective shown in Figure 5 are made through small group work. Participants to full scale workshops are administrators from all the departments in Nara Prefecture Government, which was around eighty, and participants to small group work are stakeholders relating to discussing objective. Through two full scale workshops and ten small group works, a draft of strategic plan has completed. In implementation phase, an action plan of 3-5 years planning phase corresponding the strategic plan is composed. At first, a draft strategic plan is shared among stakeholders. Priority of projects prepared in the strategic plan is set by voting of stakeholders, and performance measures for each objective are developed. Detailed techniques for participatory strategic planning are explained in Maki, N. et al (2004).

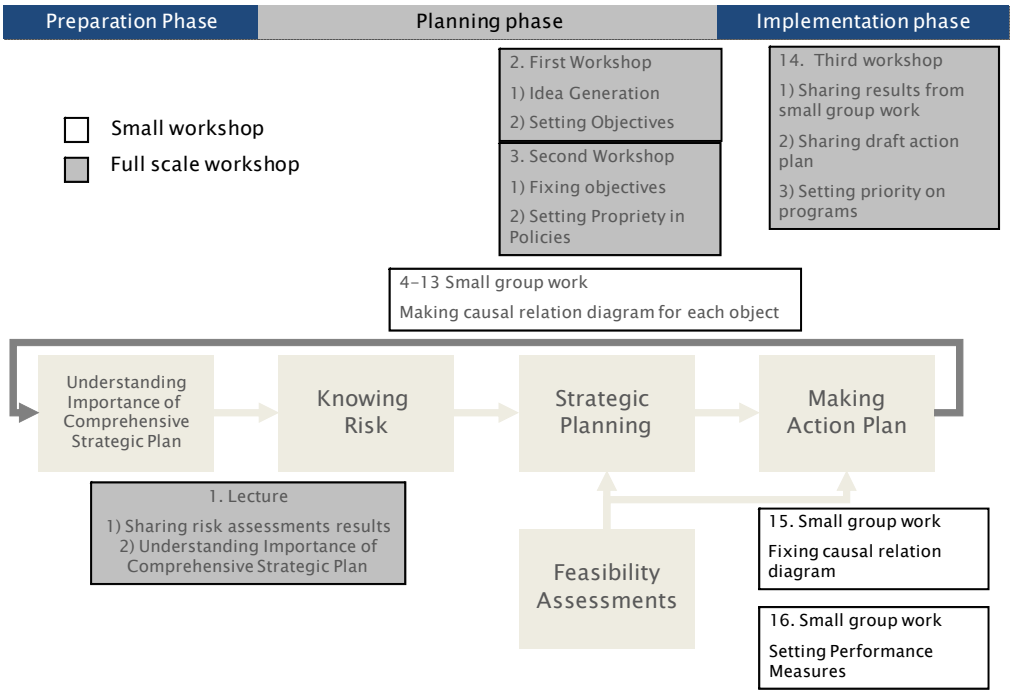


Figure 3 Planning Process for Nara Earthquake Disaster Reduction Plan

Figure 4 Ten Objectives Identified

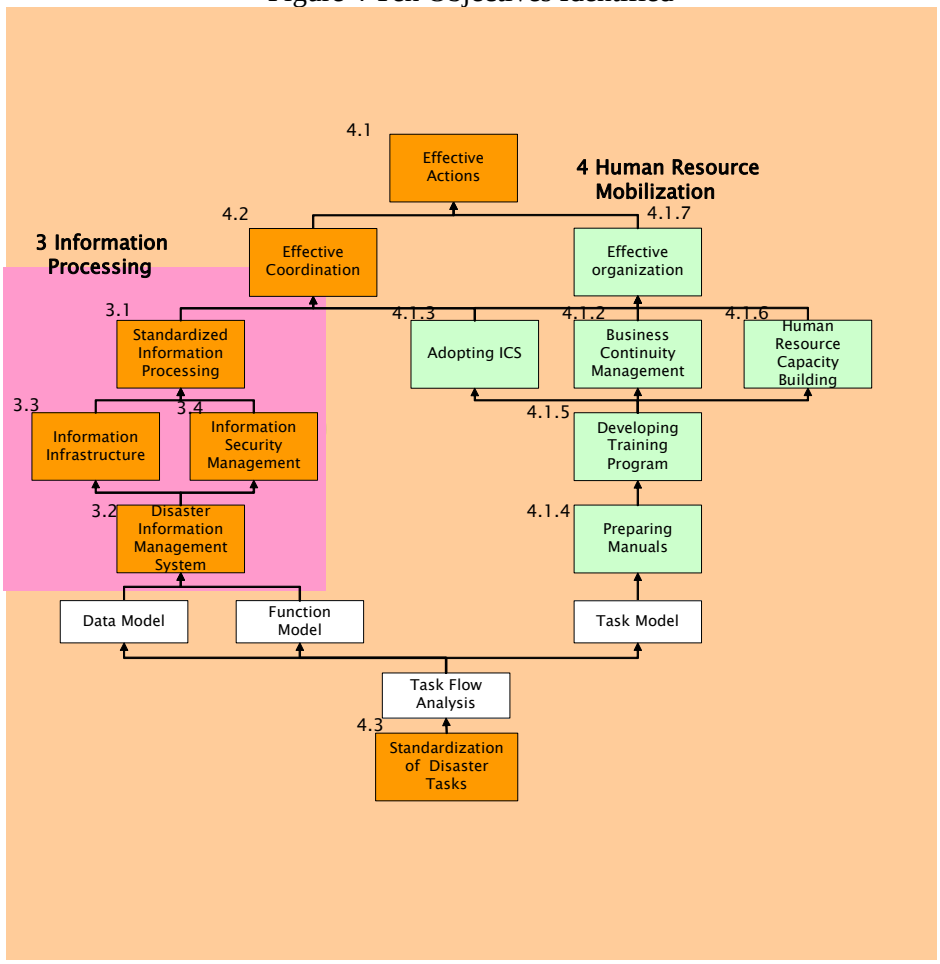


Figure 5 Causal relation daiagram

### *3.2 Participation of Stakeholders Secures Comprehensiveness*

*3.2.1 Mitigation and Preparedness*

Objectives set through workshops covers holistic nature of disaster reduction (Figure 4). First objectives "1. Making Nara Prefecture Disaster Resilience Place", which is on countermeasures for built environments such as seismic retrofits and land use regulation, corresponds to mitigation countermeasures, and second objective "2. Empowering Stakeholders", which is on countermeasures such as education for stakeholders and preparedness of citizens, corresponds to preparedness countermeasures. Third and fourth objectives "3. Processing Information Efficiently" and "4. Standardizing Disaster Response", which is on capacity building on disaster response within disaster management agency or Nara Prefecture Government, corresponds to preparedness countermeasures.

*3.2.2 Response*

Fifth to ninth objectives such as "5.1 Life Safety", "5.2 Safety and Security", "5.3 Infrastructure restorations", "5.4 Disaster Relief for victims", and "5.5 Protecting "Nara's Historical Heritage" corresponds to response countermeasures such as emergency response and relief activities. Nara is a former capital city of Japan and owns many cultural heritages which attract tourists, and objectives spotlighting to tourists in Nara is set as one objective.

*3.2.3 Recovery*

Final objective is on a long term recovery, "10. Planning for Effective Recovery". Contents of a long term recovery plan are closely related to master plan for local governments, and this part mainly deals with

procedure for a long term recovery planning.

*3.2.4 Securing four components of disaster reduction by stakeholder involvement*
There are four components for disaster reduction such as mitigation, preparedness, response, and recovery. Objectives of Nara prefecture plan cover all these four components. The plan was composed from 2015 ideas on disaster reduction. It shows the effectiveness of stakeholder involvements for establishing comprehensive plan. This is a good example of "the Wisdom of Crows" (Surowieki, J. (2005))

## 4. PERFORMANCE MEASURE SETTING

### *4.1 Difficulties Setting Numerical Target for Preparedness, Response, and Recovery Countermeasures*
Setting performance measure of objectives for mitigation countermeasures such as "1. Making Nara Prefecture Disaster Resilience Place" is not so difficult. Because core value or bottleneck for the countermeasures is clear. Upgrading seismic safety of built environments and compliance rate of present building code on seismic safety can be good numerical target or performance measure for the objective. In Nara case, 90% of compliance rate of present seismic code within five years become performance measure for the objective. However, there is no clear numerical target for preparedness, response, and recovery. There is still very big discussion about whether composing rate of community based disaster response organization (Jisyu bou) can be good explanation of "2.Empowering Stakeholders" and be a numerical target for the objective. So to set numerical target for preparedness, response, and recovery, we should start from proofing that a set numerical target can explain well the accomplishment of corresponding objective. And causal relation analysis to each "objectives" is essential to set performance measure for those components.

### *4.2 Analysis of Causal Relations on Countermeasures*
Figure 5 is an example of causal relation analysis for objectives, "Information processing" and "Human resource mobilization". These two objectives have close relation with each other, and one causal relation diagram for two objectives is set through small group work. In the causal relation diagram, a goal or objectives are put on the top of diagram, and relation of countermeasures or policies toward goal is arranged from bottom to top. So the polices put at the bottom of diagram can be a core issue or root cause to accomplish a goal. To accomplish a set goal, we should start from a core issue. In Figure 5, to accomplish effective action at the time of disaster, we should start from setting "standardize disaster response". Numerical target set for a core issue, for example "completing standardization of disaster response within 5 years", can be well explained numerical target or performance measure for "3. Processing Information Efficiently" and "4. Standardizing Disaster Response".

### *4.3 Taking Social Conditions into Account*
The process explained above is theoretically correct, however, in the real world, we should take societal condition into accounts such as stakeholder opinion, engineering difficulties, budget constrains, human resources constrain, concern of assembly, legislative constrain, cost benefit, and environment concern. Reflecting societal concern, in case of Nara Plan, performance measure for objectives which need long time to accomplish such as mitigation countermeasures, are set the numerical target in core issues, policies based on causal relation analysis, and that for objectives of urgent needs such as disaster response are set numerical target for polices put on the top of causal relation diagram without proper theoretical explanations.
Figure 6 shows the process setting performance measures starting from strategic planning, causal relation analysis, and reflection of societal issues.

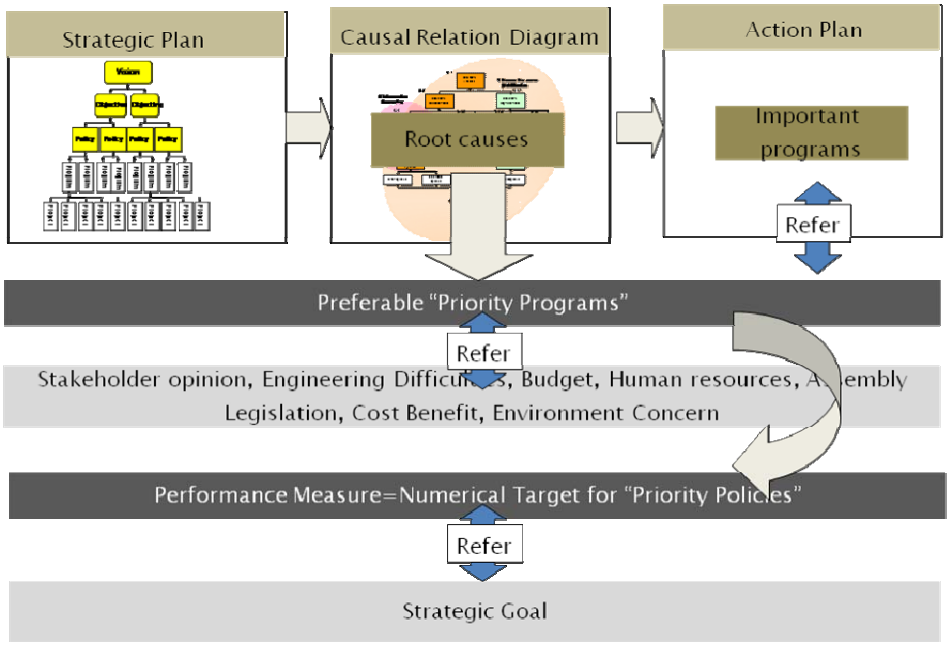


Figure 6 How to set performance measures

## 5. COMMENTS

Nara Prefecture Strategic Earthquake Disaster Reduction Plan and its Action Plan, which was developed through sixteen stakeholder workshops based on more than 2,000 ideas, is consisted of 10 objectives, 41 polices, 94 programs, and 301 projects. This plan has holistic structure covering all the four components of disaster reduction, and comprehensiveness of the plan was accomplished through stakeholder involvements in planning process. Feasibility of the plan is secured by having numerical target for each objective. The detailed process of setting performance measure was explained. This scheme can be a good tool for performance measure setting in strategic planning.

About securing feasibility of the plan, stakeholder involvements have worked very well. Real involvement stakeholders in the planning process created "the sense of ownership" about the plan among stakeholders. Now it becomes three years after completing the plan, "the sense of ownership" about the plan works really well in implementation of plans in Nara.

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